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**THE BRITISH
HERPETOLOGICAL SOCIETY**

BULLETIN

No. 17 September 1986

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 £4.00 + £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. £5.00 + £0.75 postage (surface mail) or £2.80 (air mail), U.S.A. \$10.00 + \$1.00 postage (surface mail) or £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:
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REMAINING MEETINGS 1986

- 23 OCTOBER *Conservation and Ecology of Mediterranean Tortoises*. Dr. Ian Swingland and David Stubbs: Movement patterns in *Testudo hermanni* and implications for management. David Stubbs and Dr. Ian Swingland: Conservation efforts on *T. hermanni* in S. France and Dr. M.R.K. Lambert: Natural bioclimatic range and the growth of captive-bred Mediterranean *Testudo* L. in northern Europe: implications for conservation farming.
- 18 NOVEMBER John Buckley: Natterjack conservation, including reintroductions, in East Anglia.

N.E. GROUP MEETINGS, WINTER 1986/87

- 29 NOVEMBER Dave Race: Reptiles of N.E. England. Joint Meeting with Darlington Natural History Society. At Darlington Art Centre, Vane Terrace, Darlington, 7.30 pm.
- 18 FEBRUARY Terry Coult: Reptiles of Studland Heath. The Adult Education Centre, 32 Old ALbert, Durham, 7.15 pm.

MEETINGS 1987

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

- 24 FEBRUARY Dr C.J. McCarthy (BHS BM (NH) Representative, Reptile and Amphibian Section, Department of Zoology, British Museum (Natural History), London): *Sea snakes*.
- 24 MARCH A.G.M. (separate Agenda), followed by Keith Corbett (BHS Conservation Officer and Chairman, Conservation Committee of Societas Europaea Herpetologica): *'Biogenetic reserves' and conservation of European herpetofauna*.
- 29 APRIL Dr T.R. Halliday (Reader, Department of Biology, the Open University, Milton Keynes): *Reproductive cycle and life-history of newts*.
- 10 JUNE *Amphibia and reptiles Worldwide: their care and breeding*. A discussion organised by the Captive Breeding Committee (Chairman: Simon Townson). Members and guests are encouraged to bring live animals, preserved specimens and 35mm colour slides to illustrate discussions and for display.

Topics for the remaining meetings in 1987 to be announced in the December 1986 issue of the Bulletin.

PROVISIONAL MINUTES OF THE 39th ANNUAL GENERAL MEETING OF THE BRITISH HERPETOLOGICAL SOCIETY, HELD AT 7.00 pm, MARCH 18th 1986, IN THE LECTURE THEATRE OF THE LINNEAN SOCIETY OF LONDON, BURLINGTON HOUSE, PICCADILLY, LONDON W1.

The President, the Earl of Cranbrook, took the Chair. Apologies were received from Mr R. Paul (North West England Group Representative). The Attendance Sheet (in minutes) was incompletely signed, but a head-count indicated that 42 were present.

1. The provisional minutes of the 38th AGM held on March 19th 1985, published in *BHS Bulletin* No. 14:1-3 (December 1985), were approved *nem. con.* and signed. Corrections included on p.1, item 4 (line 2), Family Membership in bold typeface; on p.2, item 13 (lines 2-4), deletion

of *in toto* of the incomplete paragraph starting "6(f) Officials ...", and on p.3, item 10 (line 5), Prof. Adler has been a BHS member since 1956.

2. **Treasurer's report and discussion.** Mrs M. Green reported on the Society's 1985 finances. A statement would be published in the Bulletin. A balance sheet was available for inspection. The Society's finances were in a good state for the first time in several years. With the increased subscription of £15 now being paid by all Ordinary Members, revenue amounted to £8,847 (£5,934 in 1984). The sum of £208 was claimed against deeds of covenant from the Inland Revenue. The increase in postage was due to increases in overseas postage. £1,200 for the Captive Breeding Committee had been placed in a deposit account. Prof. G.A.D. Haslewood proposed a vote of thanks for the Treasurer, also the President, which was applauded heartily by all.

3. **Election of Officers and Members of Council.** The Officers were all re-elected in the absence of alternative proposals. There was a paper ballot for the election of Ordinary Members of Council. Scrutineers were Mr W. Wüster and Mr J. Pickett, who declared the following to be elected or re-elected: Mr N. Bessant, Mr J.G. Coote, Mr P.C. Curry, Mr T.E.S. Langton, Mr M.E. Nolan and Mr S. Zlotowitz.

4. **Council's report and discussion.** Dr Lambert pointed out corrections including under PUBLICATIONS, BJH, not BJN (line 12); under FINANCES, £22.50 for Family Members, not £2.50 (line 3), and under MEMBERSHIP, the figure of 167 for members resigned, deceased and struck-off in 1984 included Institutions and Libraries (line 16). The report was otherwise approved *nem. con.*

5. **Report of the Education Officer.** Mr V.F. Taylor gave a brief outline of progress. A full report would be published in the Bulletin. The President gave a vote of thanks which was applauded by all.

6. **Report of the Conservation Committee.** Prof. Haslewood reported that 1985 had been exceptionally successful. The value of the practical work by Committee members had been recognised by several bodies and financial support sufficient for the Society to employ a Conservation Officer (Mr Keith Corbett). A full report would be published in the Bulletin and an account of the Committee's activities would also be given at the Society's meeting on May 28th 1986. The President gave a vote of thanks which was applauded by all.

7. **Report of the Captive Breeding Committee.** Dr S. Townson announced that a full report would be published in the Bulletin. There was £1,600 in the account which was for the publication of a book on crocodile conservation by Romulus Whitaker (Director, Madras Snake Park, India), whose manuscript was awaited. Other funding from research councils was for projects by Mr M. Matthewson on the effects of UV light on breeding in lizards and Mr Curry on breeding in frogs using hormones from the pituitary glands of fish. Large scale breeding of sand lizards from the Continent is also being carried out. The President gave a vote of thanks which was applauded by all.

8. **Other business.** As a response to a letter dated 15th March 1986 from Dr W. Wales, Secretary of the proposed BHS Scottish Group with a membership of six, Dr Lambert opened a discussion on the basis for forming regional Groups. Should a Group be based on a minimum number of members or on a geographical area? The latter was considered preferable for otherwise there could be an almost unlimited number of Group Representatives coming on to Council. The whole issue would be discussed further by Council.

Dr Lambert announced that the Catalan Ichthyology and Herpetology Society (Barcelona) intended to hold a Spanish national meeting on 1-3 November 1986, including participants from elsewhere, entitled "Marine and Freshwater Ichthyology and General Herpetology". Poster presentations were preferred. A Symposium "Exotic Animals in the '80's", which included amphibians and reptiles, would be held by the British Veterinary Zoological Society Friday-Sunday, 18-20 April 1986 at the Zoological Society of London with a Friday evening "Founders' Reception" at the Royal College of Surgeons of England, London.

Mr Bessant requested that nominations for the election at the AGM be announced sooner and that brief CVs be prepared for all candidates. Dr Lambert replied that this could be done, especially since a Bulletin is now circulated in the Autumn. Prof. Haslewood pointed out that BHS has received such strong recognition from outside bodies for the practical part played in the

conservation of the British herpetofauna that the conservation interest should be stressed by stronger representation on Council. In relation to the academic interest, UK has also been elected to host the first World Congress of Herpetology at the University of Kent, Canterbury, in September 1989, and BHS is to be a co-sponsor with Societas Europaea Herpetologica.

The President announced that Council had created an Official to act as Legal Officer. The present incumbent is Mr Curry, who is an Ordinary Member of Council in his own right. Mr Curry briefly outlined the functions of the post, for which provisional terms of reference would be published in the Bulletin.

On behalf of Council Members, Mrs Green presented a signed card to Lord Cranbrook in appreciation of his patient chairing of several querulous Council Meeting in the last year or so. This was greeted by acclamation on the part of all members.

As time allowed, Dr Lambert showed some more slides on herpetofauna in the Commonwealth. II. Ethiopian zone, and included species in subsaharan Africa and Indian Ocean islands.

Just before the end of the meeting, Lord Cranbrook displayed a wax cast for a bronze medallion to commemorate the first World Congress of Herpetology, prepared by his sculptress sister, Lady Juliet Simpson, and invited comments on this from members.

The meeting ended at 8.35 pm.

M.R.K. Lambert

The World Congress of Herpetology announces the **FIRST WORLD CONGRESS OF HERPETOLOGY**

11-19 September 1989
at the University of Kent, Canterbury (U.K.)

This international congress will be the first of a series occurring at regular intervals at venues around the world. Such a meeting will enable all persons interested in herpetology to meet and exchange information to promote the advance of knowledge and the conservation of the world's amphibians and reptiles. The congress will consist of topical symposia, poster sessions, plenary speakers, workshops, displays, excursions, and meetings of ancillary groups. Subjects and moderators of symposia will be announced well in advance so that potential participants can volunteer. The meeting will be open to all persons. Registration will begin 1 January 1988.

For further details and mail listing, write: Dr. Ian R. Swingland, World Congress of Herpetology, Rutherford College, University of Kent, Canterbury, Kent CT2 7NX, United Kingdom.

Sponsoring organizations and individuals are welcome. For further details write: Dr. Marinus S. Hoogmoed, Rijksmuseum van Natuurlijke Historie, Postbus 9517, 2300 RA Leiden, The Netherlands.

REPORT OF THE CHAIRMAN OF THE CONSERVATION COMMITTEE FOR THE YEAR 1985

The year reviewed has been the most remarkable in the history of your Committee for it included the appointment of a full-time Conservation Officer, the first professional member of staff of the BHS. In my opinion, this demonstration of confidence in our conservation activities is a result of the several years of productive fieldwork described in previous Reports and seen by grant-giving bodies to be worthy of financial backing. Until recently, BHS funds granted by Council have been a mainstay of your Committee and BHS membership as a whole should take pride in the recognition now given to the work of the Society.

The Conservation Officer post is funded for a three-year period by the Nature Conservancy Council (NCC, 50%), World Wildlife Fund — UK (WWF-UK, 25%), and Vincent Wildlife Trust (25%). Provision is made for administrative and travel expenses. A job description (see Appendix) had to be agreed with NCC and WWF-UK and conditions were that advertisements in terms sanctioned by NCC and WWF-UK would be inserted in *The Guardian* and *New Scientist* and that representatives of NCC and WWF-UK should be on the appointing committee. Your Committee set up the following appointment subcommittee: T. Beebee, G. Haslewood, H. Inns, T. Langton, J. Webster: NCC was represented by A. Cooke and WWF-UK by C. Tydeman. T. Langton and I visited the NCC Grants Officer, E.C. Hammond at Peterborough on August 8th to discuss NCC funding and conditions. An advertisement (see Appendix) appeared in the periodicals specified on 25th/26th September, to which 19 applicants responded. The subcommittee made a short list of five applicants, interviewed these at the Institute of Biology on 25th November and unanimously decided to offer the post to K.F. Corbett. He accepted and began his duties on 1st February, 1986. I kept Council informed at each stage in this unfolding drama and it agreed without dissension to the steps taken on behalf of BHS by your Committee.

It became clear later that WWF-UK funding will come from a generous gift towards conservation by H.J. Heinz Ltd., under the title "Guardians of the Countryside". Through WWF-UK, this sponsorship has also purchased a car (with full insurance) on favourable terms from Peugeot for the Conservation Officer's use and has further funded your Committee's management tasks and Sand lizard breeding/release programmes.

NCC and WWF-UK (50% each) refunded to your Committee the expenses (£368) of the Conservation Officer's appointment and also contributed to the Sand lizard breeding/release programme (WWF-UK) and BHS members travelling expenses (NCC). As I reported last year a grant from BP, obtained by Chris Tydeman through WWF-UK, was used by Jon Webster to pay for management work by Conservation Volunteers, as was the remainder of an earlier grant from WWF-UK to Keith Corbett for pond restoration. NCC also paid half the cost of printing a new BHS leaflet *Surveying for Amphibians*, written by Trevor Beebee, which is already proving popular.

On behalf of BHS, I thank NCC (especially E.C. Hammond), WWF-UK (especially Chris Tydeman) and the Vincent Wildlife Trust for their generous support; through WWF-UK I also thank Messrs H.J. Heinz. For our part we shall do our best to see to it that the final beneficiaries of all this aid are the amphibians and reptiles that BHS members care so much about.

With Keith's appointment, Tom Langton relinquishes his duties as Honorary Conservation Officer; I thank him warmly for his help in this post at a difficult time for the Society.

Management

Jon Webster arranged 10 tasks for clearance of pine, birch and gorse from dry heathland sites; on some we dug sand patches for egg-laying by Sand lizards. Jon believes that this is an important conservation measure and will lead to maximisation of breeding potential; certainly this view accords with what is known about reproduction of this species in NW Europe. All the flourishing colonies Committee members have seen have been on sites where there is obviously loose sand in sunny places; however some sites having these conditions harbour only sparse Sand lizard colonies and here factors adverse to the reptiles are presumably present. Committee policy is to create what we believe to be the best conditions on dry heathland for both Sand lizards and Smooth snakes (having regard of course to the needs of other fauna, especially birds) and we should, and will, monitor our cleared sites from year to year to try to assess the affect of our work. This important monitoring will be co-ordinated by the Conservation Officer. Attendance

of BHS members and their friends at the above tasks was between 13 and 21 (average 16). We were helped by Worthing Conservation Volunteers and others, whom I thank on behalf of BHS.

What promises to be an important breakthrough was achieved as result a of meetings on July 29th, October 30th and November 29th between Committee members and staff of the Forestry Commission (FC). The 30th October meeting identified 10 Dorest FC sites important for rare reptiles; on November 29th Jon Webster explained BHS management and associated conservation activities to a group of senior FC personnel. The FC response was most favourable and it seems likely that your Committee will be much involved in tasks on their sites in the coming winter seasons. Relations with FC have not always been fruitful in the past and what has now happened should be good news for the reptiles whose fate depends on the Commission's activities. A caveat must be Government policy to sell off FC sites to private owners, some of whom might be unsympathetic to wildlife conservation. The Committee members most involved in the FC negotiations were Keith Corbett, Dave Dolton, Tom Langton and Jon Webster.

Because of the continually wet summer, Howard Inns was unable to carry out his planned bracken-spraying programme. The bracken problem on heathland is by no means satisfactorily solved.

Monitoring. Dave and Marion Dolton, from their home on Holt Heath, continued to survey Dorset sites for reptiles and amphibians. Marion supplied her detailed records, with maps and helpful comments on 30 places, some of which were CAT (see below) sites for 1985.

Howard Inns who is one of the most thorough and careful of your Committee members especially in making field records, provided his observations on a large number of sites, mainly in Hants, Surrey and Dorset. His home near Farnham, Surrey is strategically well-placed for frequent trips to the important heaths in this county. He found Sand lizards in places where their survival had become doubtful in recent years and he also saw a Wall lizard, *Podarcis muralis*, at a Surrey site at which these reptiles were introduced in 1932-3, according to Christopher Lever (*The Naturalized Animals of the British Isles*, 1977, p.403). This species has thus survived in small numbers for more than 50 years; we know of another small colony near London with a similarly long history.

Graham Walters, a keen field observer, sent your Committee an account of his observations of the Wall lizard colony on the Isle of Wight. Unlike those unprotected on the mainland, this population is thriving; Graham has known it since 1961. The habitat is ideal, with plenty of rocky refuges as well as vegetated banks. Graham reports that he saw no tailless lizards, indicating low predation. He suggests that a biochemical comparison between members of this population and specimens from continental Europe might throw light on the Isle of Wight colony's origin. If the lizards are indigenous, they are legally protected although, as Graham also points out, they are fairly secure unless there is large-scale "development" of their habitat. I found them, in 1979, to be well-known to and popular with the local people. Generally, lizards are liked and not persecuted.

Howard Inns also saw several Grass snakes, a cheering record for your Committee members who feel that, because of changing agricultural practices resulting in shortages of manure heaps etc. in which to hatch eggs, this snake may be endangered. This question should be explored, particularly in an attempt to find out just how much successful wild Grass snake breeding is going on at present. Perhaps there is a case for captive-breeding/release by BHS members to increase wild stocks. The Kent and Sussex marsh systems with their rich populations of Marsh frogs ought to sustain plenty of Grass snakes.

Mike Preston made and reported on several visits to Surrey and Hants heathland sites. Richard Griffiths briefly summarised his work on herp. conservation in mid-Wales in 1985: he will report to the *Bulletin* on a November 1985 meeting entitled "Herpetology in Wales". Richard says that the status of amphibians is fairly well documented (including of course that of introduced *Xenopus laevis* which, surprisingly, maintains itself in the Welsh climate) but "reptiles are poorly surveyed". Richard continues his research into habitat selection by Smooth and Palmate newts. Paul Bryce, now an Adviser to your Committee, sent a most interesting account of the present status of the Midwife toad, *Alytes obstetricans*, accidentally introduced into Bedfordshire about 1900. This attractive beast appears to be doing quite well in the gravel pits and fields bordering the Great Ouse, demonstrating yet again the marginal hold that European Continental herp.

species can maintain in the UK. The only population explosion so far has been that of the Marsh frog and this into an unfilled ecological niche in two SE counties.

Other Committee members (Tony Braithwaite, Chris Raxworthy, Tom Langton, Jon Webster, Bill Whitaker) combined reptile monitoring with our Smooth snake survey (CAT, see below) as was envisaged when we signed the CAT contract with the NCC: results are valuable of course, especially as some of the CAT sites in Dorset are seriously threatened or doomed. We are licensed to collect protected species from some of these sites, for later release in areas agreed with the Regional NCC staff. Tom Langton reported in detail on one such "doomed" Dorset site, from which several Smooth snakes were rescued.

Some of your Committee members are astonishing good at spotting reptiles. It is perhaps invidious to mention names, but I have greatly admired, for example, Dave Dolton, Tony Braithwaite, Keith Corbett, Howard Inns, John Newton, Ed Wade and Jon Webster for this ability to point out Sand lizards and snakes lying almost invisible amongst vegetation. Such skills are no doubt sharpened by experience but one feels there must be an innate ability to recognise the patterns that the well-camouflaged reptiles make amongst the plants. It is their keen-eyed skills that make so many BHS members so valuable to reptile protection.

Members of your Committee have energetically pursued the cause of Natterjacks. John Buckley made forays to monitor the Natterjack colonies in Norfolk and at RSPB Headquarters in Bedford, travelling more than 3,700 miles. Brian Banks went to Cumbria to study Natterjacks there, about which we received a good report on behalf of the Cumbria Trust for Nature Conservancy from P. Kirkland of South Walney Nature Reserve. Brian and Trevor Beebee (perhaps the leading authority at present on the Natterjack) continued their work in re-establishing this species of heathland in Southern England, with promising results.

Trevor and Maggie Beebee visited the Somerset Levels, netting for amphibians with unremarkable results. They, with Mark Jones, monitored the Natterjacks and other amphibians at Norfolk sites; Trevor, Maggie and Brian Banks continued their surveys of ponds and dykes in the Brighton-Lewes areas. Marsh frogs are well established in the Lewes dykes, watched with interest by anglers there one of whom wrote to me saying that the frogs came to feed on his maggots and asking what species they were.

Arnold Cooke, an Adviser, sent us a Report of the breeding success of Natterjacks on British sites for the period 1979-84; at least 42 sites ranging from SE England to SW Scotland are known to have populations. A full account of breeding in 1985 in certain Merseyside areas of special interest to your Committee was sent by the NW Regional Office of the NCC: 1985 proved a poor year for the toads here.

Tom Langton and Keith Corbett continued to survey for Great Crested newts; BHS results were sent to Mark Nicholson's continuing collection of data at Leicester Polytechnic. Deryk Frazer, our former President and author of *Reptiles and Amphibians in Britain* (the book we generally recommend) sent your Committee his account of a study of several ponds in Kent especially in a search for Great Crested newts.

Dave Race (now a Committee member) sent us a report of the activities of the NE Region Reptile and Amphibian group, based in Darlington, Durham: particular interest is in the Grass snake, Adder, Slow-worm and Great Crested newt.

Meetings, etc.

The Committee met three times in 1985, twice at the Zoo and once (without its Advisers) at Shoreham. On the latter day, Arnold Cooke showed some pictures of the dune situation in Southport, continuing a long-standing argument with Keith on this issue. In addition to FC meetings mentioned above, Committee representatives met with personnel from BP to discuss the implications of the Company's oil extraction initiatives in Dorset. BP seems generally anxious to present a good conservation profile and our meetings with them (at the Institute of Biology on January 5th and on a Dorset site during a task on March 31st) suggested that most damage to rare herp. areas known to us would be avoided or minimised. We found, as on other similar occasions, that lack of knowledge of herps. and their needs was the main obstacle to what we regard as conservation measures. A worrying prospect is the strong pressure to reconstruct a steam railway from Corfe Castle to Wareham. Such an otherwise attractive feature would carry

a serious risk of fire to an area known to have Sand lizards and Smooth snakes as well as less rare reptiles. Four Committee members attended the opening of the Stoborough Heath NNR on 22nd October 1985: this is a valuable contribution to saving Dorset heath and the new Reserve certainly has Sand lizards although much of it had formerly been ploughed and sown to grass. Our representatives went to the usual amiable and useful meeting concerning the Hants and Surrey heathlands: Tony Braithwaite's influence here is invaluable. With the help of the MoD Conservation Officer, Lt. Col. C.N. Claydon, of the area Commandant Lt. Col. A.S. Harvey and the connivance of the Property Services Agency Foresters and local authority he has actually caused a fence to be put up to protect known Sand lizard and Smooth snake habitat on a very large Common on MoD-controlled land. Anyone who has tried to get a fence put up on a common will understand the magnitude of this feat.

At the Surrey County Show on May 27th, the Herps. Marquee presented every British reptile and amphibian. It was run by Mike Preston, Howard Inns and many others and won the First Prize. About 35,000 people saw the exhibit and many leaflets were sold.

Publications

Trevor Beebee published his paper *Geographical variations in breeding activity of the Natterjack toad Bufo calamita in Britain* in the Journal of Zoology, 205, 1-8: 1985. John Buckley occupied most of the Transactions of the Norfolk and Norwich Naturalists Society for May 1985 with his comprehensive review *The Natterjack toad in Norfolk*.

Several Committee members gave talks and lectures, both privately and as part of radio and television programmes. As well as the amphibian survey leaflet mentioned above, your Committee again obtained reprints of updated versions of *Garden Ponds as Amphibian Sanctuaries* and *Being Kind to Snakes*. The November 1985 number of *Gardening from Which* contained an article *Attracting Wildlife* which the publishers sent to me for comments before its appearance. It contained the address of your Committee, a reference to our "Garden Ponds" leaflet and a short piece about Slow-worms. We had about 30 requests for our leaflet as a result of this article (as contrasted with over 1300 following television publicity): I now enclose a single-page account of Slow-worms in gardens when filling such personal requests. For advising the Consumers Association and correcting their article we received the princely fee of £3, which just about covers the cost of sending the leaflets. Council allows its Committees to recover the cost of distributing its publications to non-members but not to operate at an overall profit, in accordance with BHS's status as a Charity.

BHS Smooth snake survey (CAT)

Your CAT team (named in the Committee list below) visited 86 sites in the 1985 season. They found at least 94 different Smooth snakes, all except six on Dorset/New Forest sites. These reptiles are very rare in the UK, except in certain areas of Dorset: here of course they were at one time common. A report of a sighting in Devon, sent to Tony Braithwaite, appears authentic. The first *Coronella* was seen on 31 March (in Surrey) and the last on 10 November, 1985 (in Dorset). I sent a full Report to the NCC, as required by our Contract, which expires on March 31st, 1987. A final Report is then required and it would be appropriate for me to summarise our work for the *Bulletin* if BHS readers wish.

Finance

On June 11, 1986, Committee credit stood at £7117.04. Of this, £5606.18 was committed to the Conservation Officer's support (£4575.33), management grant to Jon Webster (£830.85) and leases and insurance (£200). This last sum was the total requested and granted to your Committee for 1985-6 from BHS central funds. Except for the purposes mentioned and as long as the Committee can maintain its activities from external grants and donations I do not propose to drain funds needed for the *Journal*, *Bulletin*, education, administration and other BHS activities.

On behalf of BHS I thank the following who generously gave their time and muscle to help on our management tasks in 1985:

C. Beckett, T. Bernhard, D. Blakemore, D. Bird, G. Clay, S. Culpin, S. Dennison, D. Dimmock, M. Douglas, N. Gladden, G. Grant, D. Green, A. Hutton, G. Murray, K. Mellen, A. Mundell, R. Paxton, S. Reve, D. Wallace, T. Warren, A. Welch.

Members:

*B. Banks, M. Beebee, T. Beebee, *A. Braithwaite, *J. Buckley, *K. Corbett, *D. Dolton, *M. Dolton, *P. Edgar, *J. Gaughan, R. Griffiths, *E. Haslewood (Secretary), *G. Haslewood (Chairman), *H. Inns, M. Jones, *A. Langford, *M. Langford, *T. Langton, J. Newton, M. Preston, D. Race, *C. Raxworthy, *E. Wade, *J. Webster, *W. Whitaker.

*CAT members.

Advisers:

E. Arnold, H. Arnold, P. Bryce, A. Cooke, J. Griffin, J. Rudge, R. Stebbings, C. Tydeman, J. White, A. Wright.

G.A.D. Haslewood

Appendix

Conservation Officer job description.

STATUS AND DUTIES OF THE BRITISH HERPETOLOGICAL SOCIETY (BHS) CONSERVATION OFFICER

The Officer will be an employee of the BHS, under the immediate direction of the Chairman of the BHS Conservation Committee (BHSCC).

The Officer is to work to a programme drawn up and managed by BHSCC, of which he or she will be a member. Annual reports to the Nature Conservancy Council (NCC), Vincent Wildlife Trust and World Wildlife Fund (the funding bodies for the post) will be required.

Details of principal initial work are

- (1) Sites Register. To be compiled with NCC for Sand lizard, Smooth snake and Natterjack toad populations, including all relevant lowland heath and coastal habitats. The production of detailed site dossiers will be required, leading to management programmes and agreements. These are to include; maps showing all past herp. management, rare herp. sitings, fires, site photographs (past and present), population estimate tables, future management needs, site ownership/use. The format is to be large scale (at least 1:10,000) maps with overlays. Existing data is to be located and coordinated, wherever possible filling gaps. Recoverable sites, and potential translocation sites are to be included with existing sites.
- (2) Coordination of BHS herp. monitoring and survey, paying due regard to the requirements of the funding bodies.
- (3) Coordination of ongoing BHS site management programmes.
- (4) Coordination of captive breeding and release programme for Sand lizards.
- (5) Assistance in and follow-up of BHS Smooth snake survey (now in progress).
- (6) Production of annual reports and licence returns for BHS obligations to NCC and other statutory and private owners.
- (7) In conjunction with the Chairman of BHSCC, representation and liaison on rare herp. matters with statutory, voluntary and private bodies.
- (8) Report on results and extent of previous management of Great Crested newt sites. Liaison with Leicester Polytechnic project to help coordinate pond restoration projects in areas of need.
- (9) Close liaison with the Fauna and Flora Preservation Society's staff herpetologist in the herpetofauna programme UK, on the work on commoner species.

HUNGARIAN HERPETOLOGICAL SOCIETIES

Information has been received from Mr Zoltán Takács (Division of Toxinology, Hungarian Ichthyological and Herpetological Society, P.O. Box 274, 6701 Szeged, Hungary), whom through the kind aegis of the British Council of Budapest has been able to become a member of the BHS.

1. *Magyar Akvarista és Terrarista Országos Egyesület* – Hungarian Ichthyological and Herpetological Society. Founded 1984. Secretary: Á. Balkay, Gépmadár utca 12, 1106 Budapest X, Hungary.
President: Dr K. Pinter, Építő utca 12, 1184 Budapest XVIII, Hungary.
Publication: *Akvárium és Terrárium*, a periodical (being licensed), quarterly.
2. *TIT Herpetológiai és Terrarista Szakkör* – Society for the Popularization of Scientific Knowledge: Herpetological and Terraristic Section. Founded 1980. Address: Bocskai utca 37, 1113 Budapest XI, Hungary.
President: T. Fehér, Rózsa utca 8, 2013 Pomáz, Hungary.
Chairman of the Herpetological and Terraristic Section: Dr Z. Korsós, Zoological Department, Hungarian Natural History Museum, Baross utca 13, 1088 Budapest, Hungary.
Publication: *Terrarium*, periodical, triannually.

BHS REGIONAL GROUPS

The BHS needs more regional groups, and it needs your help to establish them! Members living outside the London area have been unable to take part in the social events organised by the society, until the recent formation of the north-west and north-east England groups. Regional groups provide benefit to individual members by enabling them to meet fellow herpetologists, attend lectures, field trips and zoo-visits. It also benefits the whole society by hopefully increasing membership in the regions. The more members we can attract into the society the cheaper the cost of our publications — as membership subscriptions should not have to be increased so greatly in future years. Furthermore, it should help to spread an interest in herpetology.

Council has now agreed to the formation of regional groups in the areas indicated in Figure 1. A maximum of 10 groups may be established, the number limited both by the availability of specialist lecturers, and by the cost. However, meetings in 10 regions should be far better than only in London! The south-east of England will continue to have its meetings organised by Council. There are already groups in north-west and north-east England, and most recently the welcome formation of a Scottish group. There is scope, however, for the formation of groups in Ireland, Wales, eastern England, the Midlands, East Anglia and south-west England.

I would be delighted to hear from any BHS members interested in starting any of these groups.

Over the following year Council will be reviewing rules and procedures relating to the regional groups. For the moment members interested in forming a steering committee, which should then draw up the terms of reference for the regional group (see Bulletin No.11, page 1). At this stage an elected representative may sit on Council, and have a vote, if the regional group has more than 10 members. It will then be the responsibility of the local committee to organise local meetings, for which funds will be available from Council.

If anyone is interested in forming any of the vacant regional groups please contact BRIAN BANKS, 30 FRENCHES FARM DRIVE, THE RIDGEWAY, HEATHFIELD, EAST SUSSEX.



Legend to Figure 1.

- I — Ireland
- W — Wales
- SW — South-west England:- Cornwall, Devon, Dorset, Somerset, Avon, Wiltshire and Gloucestershire
- SE — South-east England:- Hampshire, Sussex, Kent, Surrey, Greater London, Essex, Hertfordshire, Bedfordshire, Buckinghamshire, Oxfordshire, Berkshire and the Isle of Wight.
- EA — East Anglia:- Norfolk, Suffolk and Cambridgeshire
- M — Midlands:- Northamptonshire, Warwickshire, Hereford and Worcestershire, Shropshire, Staffordshire, West Midlands, Leicestershire and Derbyshire
- E — Eastern England:- Lincolnshire, Nottinghamshire, Yorkshire and Humberside
- NE — North-east England:- Cleveland, Durham, Tyne and Wear and Northumberland
- NW — North-west England:- Cheshire, Greater Manchester, Merseyside, Lancashire, Cumbria and the Isle of Man
- S — Scotland

INDIAN SNAKE RESEARCH PROJECTS

The Irula Snake Catcher's Cooperative is a tribal self-help project based on catching snakes, extracting their venoms, marking and releasing them back to the wild. Last year about 22,000 snakes were caught and released, the majority *Echis carinatus*.

The Irula Cooperative is committed by its stated objectives to carrying out research pertinent to its activities of "passive exploitation" of snakes. Present data collection on distribution and abundance of snakes, scat analysis, sex ratios etc., are just some of the areas to be worked on.

The Cooperative is interested in collaborative research projects. As it is a tribal project it could provide basic facilities only, funding would have to be provided by the collaborator.

For further information please write to:

Romulus Whitaker, Irula Snake Catchers Industrial Cooperative Society
c/o Madras Crocodile Bank Trust
Vadanemmeli Village, Perur Post
Mahabalipuram Road
Chingleput Dist, Tamil Nadu
SOUTH INDIA 603104

VETERINARY ANATOMISTS REQUIRE DEAD TORTOISES!

In order to develop a better veterinary clinical service for reptiles, a course of instruction on the anatomy and physiology of snakes and tortoises is given to first year veterinary students in the Department of Veterinary Anatomy, University of Liverpool. With the current bans on the import and sale of pet Mediterranean tortoises, it is now very difficult to obtain specimens on which to base the course. There is a special need for tortoises in order to prepare permanently mounted specimens of the internal organs and skeleton in the teaching museum for use by successive generations of students. A desire has also been expressed about not wishing to take the life of healthy animals that could have been bought previously.

Members are asked if they have a dead tortoise, whether it can be placed in a deep freeze to await collection. *Please contact:-* Prof. A.S. King, Head, Department of Veterinary Anatomy, the University of Liverpool, (Brownlow Hill and Crown Street), P.O. Box 147, Liverpool L69 3BX, Merseyside; tel. 051-709 6022.

TEN YEARS OF GARDEN PONDS

TREVOR BEEBEE

434 Falmer Road, Woodingdean, Brighton

INTRODUCTION

It's become well-known that garden ponds can be excellent breeding sites for most of Britain's native amphibians provided they are made and maintained in suitable fashion. Having now spent 10 breeding seasons at our current abode, with the first pond installed a month or so after our arrival, it seemed like a good time to review the various successes and failures. This article reports the results of deliberately introducing 7 species of amphibians, 5 native and 2 alien, over the past 10 breeding seasons.

THE SITE

The garden dimensions are some 13 x 25 metres, set on a west-facing slope of the South Downs. The first pond installed (pond 1) is in a relatively cool area of the garden, though it receives sun for a good part of the day. It was made in February 1977, with overall dimensions c.3x4x0.6 (max) metres. It has multiple-depth shelves and a greater variety of plant life than the other 2 pools; these include an ornamental lilly, yellow flag iris, king cup, water soldier, water parsnip, Canadian pondweed, hornwort, groenlandia, curly potamogeton, square St John's Wort, tubular water dropwort and (sometimes) water crowfoot. Pond 2 was first made in 1978 but has been modified on many occasions; since 1983 it has been about 0.7x1.5x0.4m, with uniform depth and a glass side-window. It is in a warm and sunny position, but has relatively few plants (most notably water plantain and arrowhead, with some hornwort and Canadian pondweed). For much of the year it remains green and soupy with single-celled algae. Pond 3 is the largest (3x5.5x0.6 (max) metres), made in January 1979 in the sunniest part of the garden. It has only 2 depths; 80% is at the maximum, and 20% forms a uniformly shallow (7-8cm) shelf. Plants include blue iris, hornwort, Canadian pondweed, frogbit, water soldier, lesser yellow lilly and greater duckweed as the most abundant.

Table 1. Pond temperature

Season	Temp. measured	Depth variation (Pond 1)			Variation between ponds (at 40mm depth)	
		40mm	200mm	450mm	Pond 1	Pond 3
Winter	Minimum	2	4.5	5.5	4.1	3.3
	Maximum	9	7.5	5.5	9.1	8.2
Spring	Minimum	1	3	11	2*	4.3*
	Maximum	24	19.5	14.5	10.1	10.1
Summer	Minimum	15.5	15.5	14	10.9	12.3
	Maximum	37	26	21	20.7**	22.8**

Seasons for depth variation measurement were in fact single months (Jan, Apr & Jul) in which thermometers were left in place for 2-3 weeks before taking single (cumulative) readings. Seasons for variation between ponds were: Dec-Feb, Feb-Mar & Apr-Jun (all inclusive). In these cases measurements were taken at weekly intervals and the figures are the averages of these measurements. *, ** = pairs significantly different by t-test.

Ponds 1 and 3 are made from butyl, pond 2 is concrete. Fish are absent from all, though I have tried (unsuccessfully) to introduce 3 and 10-spined sticklebacks to pond 2. These have perished in the recent severe winters. I have stocked the ponds as richly as possible with invertebrates; pond 1 has water scorpions (*Nepa*), lesser and greater water boatmen, water spiders, horse leeches, damsel and dragonfly (*Libellula* and *Aeshna* type) nymphs, flatworms, *Limnaea* and ramshorn type snails and various small water beetles. Pond 3 is also rich; it has smaller leech species (not horse leeches), otherwise as in pond 1 but with healthy populations of great diving

beetles and saucer bugs. Water lice and shrimps are common in all ponds, as are large blooms of daphnia in spring and early summer. Differences in the temperatures attained at different depths in pond 1, and at the same depth in ponds 1 and 3 are summarised in table 1, the results of some max/min thermometer measurements in 1985 and 1986. As expected, temperature variation was greatest in shallow areas which can get up to blood heat in summer. Pond 1 seemed to stay slightly warmer than pond 3 in winter (though the differences were not significant); in spring minimum temperatures in the shallows stayed higher in pond 3, and in summer pond 3 was certainly the warmer of the two.

METHODS

For the most part I have simply observed events (numbers of spawn clumps etc) and noted them; amphibians were however introduced to the ponds deliberately in the first instance (see below) either as spawn or adults, so colonisation was not natural. I made a conscious choice that the ponds would be for pleasure rather than science, a rule I broke only once in 1986 with mark/recapture exercise to estimate newt numbers. For this I did the following, over one 24-hour period at the end of April: (a) I went around the ponds 5 consecutive times after dark one evening, with a powerful torch and hand clicker-counter, registering the numbers of crested, alpine, male palmate, male smooth, and total "small" female newts in turn and separately for each pond. (b) I set Llydsinam-type newt traps (5 each in ponds 1 and 3, 2 in pond 2) late in the evening, and collected newts from them early next morning. All caught newts were toe-clipped, returned to the pond they came from, and left for 6 hours. (c) Later in the day, the ponds were netted vigorously for 15 minutes each and animals caught and counted (together of course with noting the numbers of marked individuals of each species in each pond). Population size for each species in each pond was calculated from the formula:

$$P = a(n+1)/(r+1)$$

Where P=estimated number; a=No. toe-clipped initially; n=number caught in second round (netting); r=no netted bearing mark. Standard deviation was calculated as:

$$SD = a^2 (n+1) (n-r)/(r+1)^2 (r+2)$$

These formulae are appropriate for single exercises involving less than 20 recaptures (as these did).

Table 2. Breeding activities of frogs and toads in the garden ponds

YEAR	SPECIES							COMMON TOAD No. Strings In Pond	EDIBLE FROG First Spawn Laid
	COMMON FROG			No. Clumps	No. Frogs Killed		Total		
	First Spawn Laid	Last Spawn Laid	Spawn Period (Days)		M	F			
1978	—	—	—	1(4)	—	—	—	(1)	June 17
1979	March 14	April 21	38	32	0	0	0	(3)	None laid
1980	Feb 21	March 24	33	56	0	0	0	(20)	None laid
1981	Feb 16	March 11	25	56	6	4	10	(1)	May 25
1982	March 4	March 21	17	130	2	1	3	1(2)	May 29
1983	Feb 23	March 19	24	110	23	12	35	2	June 9
1984	March 4	March 23	19	92	20	9	29	1(2)	June 9
1985	March 5	March 31	26	86	6	2	8	(5)	May 25
1986	March 16	March 31	15	105	22	9	31	1	June 17
Average	March 2	March 25	23	83*					June 6

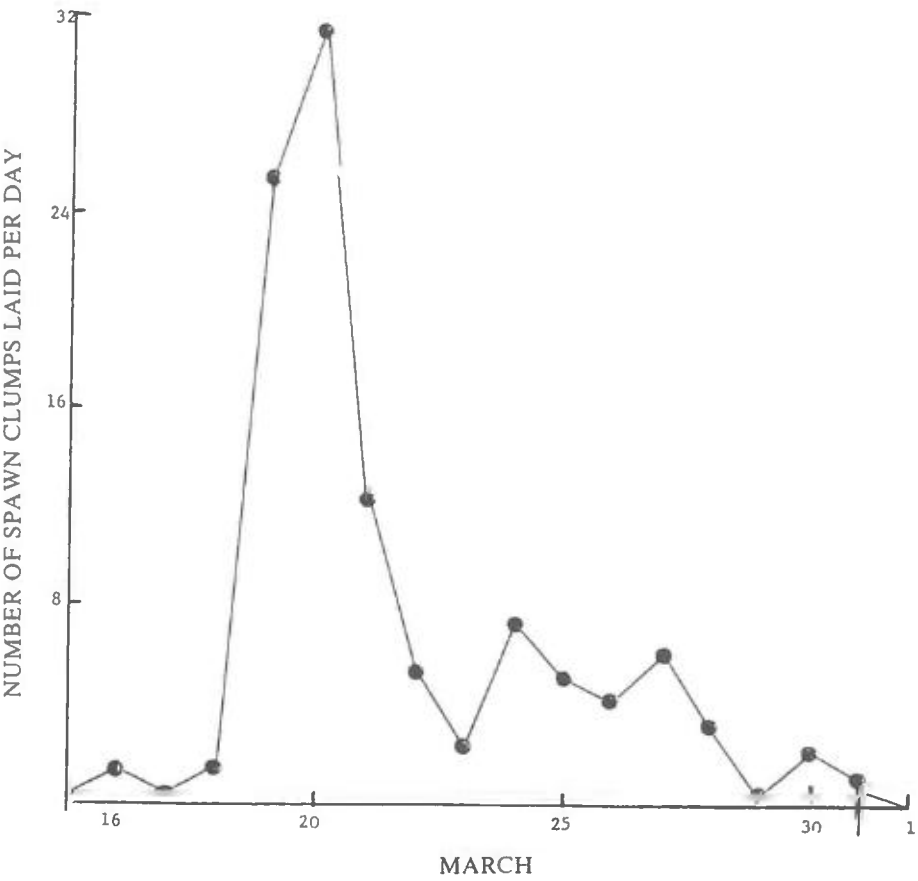
*Excludes 1978. M=Male, F=Female

THE AMPHIBIAN STORY

The fate of frog and toad introductions is outlined in table 2. Common frog introduction actually began in 1977, with 11 clumps of spawn. This may not have been necessary, as there were

certainly “native” frogs in the garden and 1 pair of these spawned in pond 1 in 1978. After a small booster of more spawn in 1978 I have added none since. The first progeny (from 1977) seem to have returned in numbers in 1979, where most still spawned in pond 1 though a few latecomers used the new pond 3. Since 1980 pond 1 has been completely abandoned for spawning, though it is still popular as an overwintering site, and all frog breeding (with occasional exceptions of odd clumps in pond 2) has subsequently been in the warmer pond 3. Numbers seemed to increase to a peak in 1982, fall off somewhat and most recently (after the severe winter of 1985/6) resurge again. Pond 3 teems with frogs in March, and breeding has been successful — with froglets emerging — every year so far. This success has not been without cost to the frogs, however. The breeding activity attracts predators, and in the peak years of 1983-4 considerable numbers, mainly males, were killed and left near the ponds. The cause turned out to be a vixen which had taken up residence at the end of the garden; she was caught in a live-trap and moved, since which time mortality rates from predation have apparently dropped sharply. However, this may be deceptive because foxes kill wastefully; sometimes only the head was eaten, often nothing at all (the frog just being bitten through). Other predators eat the lot and leave no trace and in the last 3 years I have watched a pair of crows visiting the pond and doing just that. These figures also do not include frogs dying from no obvious cause — presumably exhaustion — during or shortly after spawning. There are always a few of these, say 2 or 3 visible each year on average, but murky water and weed growth has prevented serious estimation. They seem to be mainly females. In the last 2 winters deaths from suffocation under ice have been significant, dramatically so in 1986. Almost all the visible mortality this year (see table 2) was from this cause, again selecting for females. Interestingly, no dead frogs were seen in pond 3 after the ice melted but 16 in the small pond 2 (including 6 immatures not listed in table 2) and 21 in pond 1.

Figure 1. Frog spawning pattern in 1986.



The starting date for spawning has varied by a full month, from mid-February to mid-March, over the past decade. The duration of spawning has also varied, from about 2 weeks (after the late thaw of 1986) to more than a month. Delays are of course often caused by intervening cold spells, but the pattern of 1986, a sharp peak with 2-4 nights of frantic activity, followed by a series of stragglers, is quite typical (figure 1). Usually 1/2 to 2/3 of the spawn is laid during the peak, which in turn usually comes within 4-5 days of the first spawn clump sighting. 1981 was unusual in this respect, with a gap of more than a fortnight between first spawn and the main activity.

The situation with common toads could scarcely be more different or less satisfactory. Despite persistent attempts, sometimes with substantial amounts of spawn (e.g. in 1980, when many toads were rescued from a cracked pond and spawned in captivity) there are no signs of a colony establishing. Odd pairs and males do turn up, and in recent years I have had 1 or 2 spawn strings laid; interestingly the toads always use pond 1 and avoid pond 3 completely, perhaps because there are so many frogs there. The spawn, however, has never given rise to tadpoles. Sometimes it just dies (as this year), other times it develops slowly, tadpoles grow very slowly and disappear when about half-grown.

I first released edible frogs back in 1977 (8 adults from France); these bred in 1978 and then disappeared. In 1980 I introduced about 20 adults and juveniles caught in a Surrey claypit and these have spawned every year subsequently (always in pond 3). This too, however, has never come to anything. I suspect hatchlings are eaten or inhibited by the high density of common frog tadpoles, but even spawn put in tanks has fared poorly with slow growth rates and only once did I produce (tiny) froglets indoors. The colony is thus slowly diminishing, with only 6 adults in 1986. Their behaviour is interesting; males dominate pond 3 but females migrate to ponds 1 and 2 before and during the breeding season, except for a brief visit to pond 3 to mate. When the males calm down (usually by July) the females return to pond 3 until late summer; then there is a general move to pond 2, which receives a lot of afternoon sun in autumn, before disappearing into hibernation. Some females certainly overwinter in pond 3, because every spring I rescue at least 1 from amplexus by male common frogs.

Newts have, on the whole, fared better than anurans in my ponds. These have always been introduced as adults rather than spawn or tadpoles; in Spring 1977 I released about 20 smooth newts, 10 palmates, 5 great crested and 5 alpine into the newly-created pond 1. This was supplemented in 1978 with another 5 crested newts, and in 1981 with about 20 or more palmates. There were conspicuous increases in numbers of smooths, palmates and crested newts coming to the ponds in the spring of 1979, suggesting that these species can become mature (both sexes) within 2 years. Alpines, on the other hand, took off a year later implying a longer growth period for this newt in Sussex. Table 3 shows the first dates each year when I observed individuals of each species in my ponds. Careful observation, along with extensive netting and weed removal in November and December every year, has convinced me that there is essentially no overwintering by newts in my ponds; I have never seen a single adult of any species at this time, though a few larvae do remain. There were no significant differences between the 3 British species on this basis, but I am sure this measure is not really sufficient to describe what is going on. It has long been my impression that the bulk of the palmate population arrives earlier than the other 2 natives, and the mortality figures this year tend to confirm this notion. When the ice melted in March, there were 8 palmate newt corpses (4 of each sex) but only 2 male smooths (and no crested or alpines). These undoubtedly migrated in January before the severe weather descended. Alpine newts always arrive much later than the other 3, usually well into March. In the mildest winters of the decade (1983 and 1984) I watched female crested newts laying eggs in pond 1 well before the end of January.

I refrained from any serious attempts to estimate the size of my newt populations until this last year. The results of the mark/recapture exercise are shown in table 4. Since this was a single attempt, the numbers reflect only the newts present at one particular time in Spring (albeit when I judged numbers were near their peak, at the end of April) and should therefore be thought of as minimum figures. Smooth newts are obviously the commonest type, with several hundred present spread across all 3 ponds but especially abundant in warm pond 3. Alpine newts have done extraordinarily well, with at least 100 again using all 3 ponds. Palmates are outnumbered by smooth newts by at least 10:1, but seem to maintain a viable population at this low level. None

Table 3. Dates of first newt sightings

YEAR	SPECIES			
	Smooth	Great Crested	Palmate	Alpine
1978	Feb 26	Feb 26	Feb 26	April 9
1979	Feb 11	March 1	March 4	March 25
1980	Feb 3	Feb 4	Feb 5	March 2
1981	Jan 16	Jan 22	Jan 25	March 6
1982	Jan 23	Jan 30	Jan 30	March 9
1983	Jan 3	Jan 5	Jan 3	March 14
1984	Jan 2	Jan 2	Jan 2	No recorded
1985	Jan 28	Feb 2	Jan 28	March 4
1986	Jan 18	March 15	March 17	March 10
AVERAGE	Jan 25	Feb 4	Feb 4	March 14

were trapped in pond 2 but 5 subsequently netted there. Crested newts seem to have stabilised at low 10s of adults and, interestingly, seem to select slightly for the original pond 1. Adults are rarely seen in the small pond 2, and never stay there long. Certainly it is noticeable that far more large crested newt larvae are seen every year in pond 1 than in pond 3, and I believe that for some unknown reason most crested newt recruitment is still from this pond. It may be that newt eggs in pond 3 are predated by the large number of frog tadpoles and smooth newts present there.

Table 4. Newt population estimates

SPECIES	A					
	POND					
	1		2		3	
	No(SD)	% of Total	No(SD)	% of Total	No(SD)	% of Total
Smooth	115(32)	22	48(15)	9	364(111)	69
Palmate	8(3)	31	(5)	(19)	13(4)	50
Great Crested	12(4)	63	0	0	7(2)	37
Alpine	43(12)	44	16(8)	16	39(21)	40

SPECIES	B					
	M:1 Sex Ratio Estimate		Mark:Torching Estimates Ratio *	Numbers Counted Ratios**		
	In Traps	By Net		By Trap	By Net	By Torch
Smooth	1.3	1.2	1.89	1	3.4	4
Palmate	—	1.8	2.00	1	17	13
Great Crested	3.0	0.8	0.95	1	0.75	2.5
Alpine	3.5	1.3	2.00	1	1.2	1.8

* = Ratio of total numbers estimated to be present (in all ponds) by mark-recapture to the highest count of the species by torching (all ponds) on a single occasion.

** = Ratios of animals caught or seen by the 3 methods (totals for all ponds) during the mark-recapture study, setting the usual lowest (trap figure) at 1. This assumes torching counts of females can be divided into smooth: palmate at the proportion estimated by mark-recapture.

It was interesting to compare the population sizes calculated from mark/recapture with those measured directly by netting, torch counting and trapping. Torching stands out as a powerful and simple method for these small pools; essentially all of the large great crested newts can be seen directly, and probably about half of the smaller species. Trapping also produces a sex ratio which is probably inaccurate (biased towards males) for all 4 species.

DISCUSSION

It has been fascinating to see the enormous population densities that can build up, at least for some species, in the garden environment. Frogs are so abundant that many individuals show signs of poor health; those seen foraging in summer are often skinny and look in poor condition, and limb mutilations are frequent, suggesting pressures of food supply and predation. It is easy on a warm summer evening to find 30-35 adult frogs trying to scratch a living in a garden (to which they are not of course confined) of less than 1/6 acre. Interesting questions have also arisen, such as why do toads and edible frogs fail to breed, and what determines the relative numbers of the newt species? Only 7 hours up the road is a large pond with a thriving toad colony, probably assisted by pond size and the presence of fish (which predate competing frog tadpoles). But I suspect there are also more subtle problems, difficult to address, of water chemistry and suchlike. It is notable that pond 1 has become a miniature dewpond in terms of the amphibians using it (no anurans, lots of smooth newts, some crested and palmates). Frog and toad spawn simply will not survive in this pond now, though pressure from newts is less than in pond 3. It has proved possible to crop the amphibians doing well for the benefit of others wanting specimens; I have lost track of how many clumps of frogspawn, alpine and crested newts I have supplied over the years. I reckon that the ponds can withstand the abstraction of at least a couple of pairs of crested and a dozen or so alpines each season. Certainly the pleasure derived from these pools has been out of all proportion from the work involved installing and stocking them.

THE HERPETOFAUNA OF JERSEY

SIMON TONGE

Jersey Wildlife Preservation Trust, Les Augres Manor, Trinity, Jersey, Channel Islands

The most recent and comprehensive report on the reptiles and amphibians of the Channel Islands is that of Le Sueur (1976). Unfortunately most herpetologists are not aware of that account and usually cite Frazer (1949) as being the most recent authority on the subject. This article has been written partly to draw attention to Le Sueur's work but also to update it and to discuss some of the conservation problems facing the herpetofauna of Jersey.

AMPHIBIA

Three species of amphibians occur on Jersey. These are the Common Toad (*Bufo bufo*), the Agile Frog (*Rana dalmatina*) and the Palmate Newt (*Triturus helveticus*). No other species have been reliably reported from the island.

Common Toad (Bufo bufo). This is the best known amphibian on Jersey. Although less common than it was, the toad can still be found almost throughout the island during the summer when the adults have dispersed from their breeding ponds. As pointed out by Le Sueur (1976) toads are commonly found using garden ponds as breeding sites, probably as a result of the destruction of more natural sites. This is certainly the case near built-up areas, but toads breed in large numbers in natural ponds at places like Les Landes in the north-west of the island and Noirmont and Quaisné in the south-west. Most of the inland valleys of Jersey have been flooded to provide water for the human inhabitants and the reservoirs so created are not suitable breeding sites for toads though the small ponds and streams that once existed in the valleys undoubtedly were. At Mont Cochon, just west of St. Helier, migrations of significant numbers of toads to their breeding ponds still occur during late February and March. A warning sign has been installed as part of the FFPS Toads on Roads campaign.

Agile Frog (Rana dalmatina). The only site known to the author where agile frogs breed is at Ouaisné Bay. Mont Mado ponds mentioned by Frazer (1949) were filled in some years ago. Although Le Sueur (*op. cit*) mentions six other localities where spawn has been laid these are tiny populations, if indeed they still exist and are probably not viable in the long term. This places great importance on the site at Ouaisné which, unfortunately, does not seem to be as secure as its biological importance merits.

The site consists of a pond about 1000m² adjoining an area of gorse heath. In winter the pond is fairly open and Agile Frogs can be seen in it during March, but by June it is almost completely choked with reeds and, although it is very difficult to check, it seems likely that few tadpoles are able to survive. On the gorse heath there are, or were, several smaller ponds of varying dimensions up to about 100m². These ponds remain relatively free of vegetation throughout the year and in February and March are full of breeding toads and frogs.

In the years 1980-86, it became progressively harder to find frog spawn in the gorse ponds, presumably due to a decrease in the numbers of frogs breeding. In early June 1986, the ponds dried out completely killing several thousand tadpoles of both toads and frogs. Despite the wet summer of 1985, the ponds had only just filled up by the end of January, 1986. Usually they are full all winter. It seems that there may be a problem with the water table at Ouaisné. The amount of gorse on the heath has increased during the last 3 years and some ponds that were accessible are no longer so, while others appear to have become completely overgrown. If this trend continues the Agile Frog will become extinct at Ouaisné within the next 5 years.

Ouaisné supports populations of all the Jersey herptiles, bar the Wall Lizard (*Podarcis muralis*) as well as some plants that are found nowhere else on the island. Preliminary work has begun on a Management plan for Ouaisné Common (Charmaine Chapon *pers. comm.*), but a detailed study of the hydrology of the area and the ecology of the Agile Frog is sorely needed. Although frogs are no longer used for dissection in Jersey schools, and therefore spawn is not collected by teachers, the author knows of several people, who really should have known better, who have

taken frog spawn for 'conservation purposes' during the 1980's. Almost needless to say, not a single frog was put back to Ouaisné as a result of these initiatives.

Palmate Newt (Triturus helveticus). Very little can be added to Le Sueur's account of this species. It is very widespread and probably common in many places on the island. It occurs at Ouaisné, at St. Brelades, and there is a small population breeding in a pond at the Zoo in Trinity. Specimens that have just emerged from hibernation and are walking to their breeding ponds are sometimes mistaken for lizards which may account for the occasional anomalous record of the latter.

REPTILES

Four species, three lizards and a snake, appear to be native to Jersey and a feral species of terrapin occurs at St. Ouen. Four species of marine turtles have been recorded stranded on Jersey beaches.

Slow worm (Anguis fragilis). This is the most widespread reptile in Jersey. Le Sueur (op. cit.) states that its numbers have decreased this century but it is still common. The author found neonate specimens in a garden in the centre of St. Helier in 1982 and the species occurs on the dunes at Les Meilles, along the north coast cliff path, in the Zoo and doubtless throughout the island in the suitable habitat.

Wall Lizard (Podarcis muralis). Of the three Jersey lizards the one with the most enigmatic distribution is the wall lizard. It is found in the north-east corner of the island between Gorey Castle and Bonne Nuit Bay and is restricted to rocks along the cliff sides. There is also a thriving population on St. Aubin's Fort. The Lizards were introduced there some years ago. Why the species does not occur naturally west of Bonne Nuit Bay in apparently suitable habitat has never been explained, but the matter is currently under investigation by Chris Perkins of the University of Bristol and hopefully an answer will be available in two or three years time. The most readily visible population is on the walls of Gorey Castle.

Green Lizard (Lacerta viridis). This attractive species is probably the best known of all Jersey reptiles. With regards to its distribution the map in Le Sueur (1976) is still substantially correct but there may be small populations scattered along the north coast which have not been recorded before. The species stronghold is the south west of the island on the dunes, and in the heath along the cliff tops at Noirmont and Corbiere.

In 1984 the Education Department of the States of Jersey provided a grant, in honour of the 25th anniversary of the founding of the Jersey Zoological Park, for someone to undertake an ecological study of the Green and Wall lizards. This was in response to widespread concern that the former species, in particular, may be declining. Chris Perkins started preliminary work in October 1985 and 1986 was the first full season in the field. First results indicate that some of the populations, especially those near built up areas, have become extinct and that the overall distribution of the species has become more fragmented. However, the fact remains that in some places, e.g. on the dunes at Quennevais or in the gorse and broom at Petit Port it is possible to see many lizards of all ages without difficulty. Habitat destruction and the depredations of domestic cats have undoubtedly contributed to any decline that may have occurred.

Frazer (1949) commented on the colouration of Jersey Green lizards and drew attention to the fact that they differ markedly from specimens on the mainland of Europe. His observations have been borne out by other people familiar with both Jersey and European Green lizards. (Roger Avery pers. comm.) Jersey lizards are much darker, sometimes appearing to be almost black with green spots. Lest this should encourage someone to describe the Jersey population as a new race it must be said that no particular distinguishing characters have ever been noted. It seems likely that the Jersey population is simply a well marked local variety that falls within the total variation that occurs on the mainland.

Grass Snake (Natrix natrix). The grass snake is probably the most inconspicuous herptile to be found in Jersey and it is consequently easy to underestimate its numbers. However, it does appear to be rare even in the few places where it is definitely known to occur (e.g. St. Ouen's pond). Although it has been found at widely scattered localities on the island in recent years the overall status of the population is a complete mystery. Frazer (1949) pointed out the resemblance between Jersey specimens and those of the Iberian peninsula.

Red-eared Terrapin (*Pseudemys scripta elegans*). There is a large, feral, population of this species in the south canal, just south of St. Ouen's Pond. It is undoubtedly derived from 'liberated' pets, but whether any reproduction has occurred, is not known. Specimens are frequently caught by anglers.

Kemp's Ridley Turtle (*Lepidochelys kempi*). One record, a specimen found alive at Beaumont on 10th December 1938. Now in the British Museum.

Loggerhead turtle (*Caretta caretta*). Five records: La Mare Slip, 17th November, 1950 (specimen was alive and taken to London Zoo, in early 1986 it was transferred to the Blackpool Tower Aquarium); St. Ouen's Bay, December 1954 (immature female, now in the Jersey Museum); St. Aubin's Bay, 5th February 1955 (now in the British Museum); Le Groun Point, St. Brelades, 21st February 1960 (now in the Jersey Museum); Bel Royal, St. Lawrence, 3rd February, 1977, (freshly dead, specimen now lost).

Hawksbill Turtle (*Eretmochelys imbricata*). One record of a dead specimen (now lost) in St. Ouen's Bay during 1948.

Leatherback Turtle (*Dermochelys coriacea*). Two records: a live specimen in the sea off Jersey in August or September 1965 and a long dead specimen in Giffard Bay on the north coast from 30th October 1985.



DISCUSSION

Although conventional wisdom has it that the reptile and amphibian fauna of Jersey has suffered a population decline during the post-war period, it is very difficult to produce hard evidence of the nature or extent of this decline. Compared with Frazer's (1949) account, it appears that some species (e.g. Slow worm and Wall lizard), are still found in more or less exactly the same places that he described while others (e.g. Green lizard and Agile frog) appear to have become much less common. As a first step towards understanding these population trends a field study of the Green and Wall lizards has been undertaken and we should have some results in a few years time. However, a far more urgent conservation problem appears to be the Agile frog. This species is found at only one site on the island, Ouaisné Bay, and this site appears to be undergoing ecological changes that are not yet understood and are only now beginning to be studied. As all the other Jersey reptiles and amphibians, bar the Wall lizard, occur at Ouaisné, the importance of this site cannot be overstated. It would be tragic if an island of such comparative wealth and sophistication were to allow Ouaisné to be lost through neglect.

As long as the sand dune system at St. Ouen is protected there will be Green lizards in Jersey. Likewise the Wall lizard is thriving in several places, particularly man made ones. While these places are protected the wall lizards will survive. The problem in Jersey is that human pressure on all natural resources, particularly land and water, is intense and it is hard to see how the long term safety of some of the more fragile sites can be absolutely guaranteed. Jersey, like most other places, has its pro-development lobby and their star seems to be in the ascendant at present.

All Jersey's reptiles and amphibians are protected from being bought, sold, killed or exported by the Wildlife Protection Law of 1947. However the protection of certain habitats, particularly at Ouaisné which is on common land, is much less rigid. Currently, the Island Planning Law is being amended to bring it into line with the U.K. Wildlife and Countryside Act concerning sites of Special Scientific Interest.

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HERPETOLOGY IN CYPRUS

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Ed. note: This is another of a range of articles published in the BHS Bulletin on herpetological studies in Commonwealth countries.

Cyprus, a European member of the Commonwealth since 1960, is the third largest island in the Mediterranean Sea (exceeded in size by Sicily and Sardinia). Its eastern Mediterranean situation places it at Cape Kormakiti about 45 miles (75 km) distant from the nearest point in Asia Minor — Cape Anamur (Turkey) — and it is effectively embraced by the land mass comprising Turkey, Syria and Lebanon, with whose faunal and vegetational elements it has the closest affinity. Topographically it is characterised by a narrow limestone range of mountains (Kyrenia mountains) forming a backdrop to the north of Nicosia, the capital, and extending in an unbroken chain for about 90 miles (140km) along the north coast at an average height of 2000 feet (600m); a broad central plain (Mesaöria Plain) running for some 60 miles (95km) from west to east; an extensive igneous massif (Troödos mountains) rising to over 6000 feet (1800m) in the west of the island, and narrow coastal plains set between the mountains and the sea. It is a dry island with rivers little more than mountain torrents and there is no stream of any volume. The somewhat intense Mediterranean climate has a hot, dry summer and variable warm winter, and is defined bioclimatically by UNESCO/FAO (1963) as being thermo- and xerothermomediteranean, with the xerothermic index ranging from 100 to 200.

As an island, Cyprus does not yield a big herpetofauna and, really, rather surprisingly, quite little work has been done on them. Boulenger (1910) listed three amphibia and 21 reptiles:— Amphibia: *Rana esculenta/ridibunda*, *Hyla arborea* and *Bufo viridis*; Reptilia: *Mauremys caspica rivulata*, *Gymnodactylus kotschy*, *Hemidactylus turcicus*, *Agama stellio*, *Lacerta laevis*, *Acanthodactylus schreiberi*, *Ophisops elegans*, *Mabuya vittata*, *Ablepharus pannonicus*, *Eumeces schreiberi*, *Chalcides ocellatus*, *Chamaeleo chamaeleon*, *Typhlops vermicularis*, *Natrix natrix*, *Coluber gemonensis*, *C. dahlii*, *C. nummifer*, *Contia collaris*, *Tarboophis fallax*, *Malpolon monspessulanus* and *Vipera lebetina*. Since this list was published, a few other herpetologists have collected in Cyprus e.g. Werner (1936), Knoepffler (1963), Clark (1973), Warmelo (1983) and Schmidtler (1984). Several visits have been made recently by the Swiss herpetologist, Beat Schätti of Zürich University, who has just described an endemic new snake species, *Coluber cypriensis* n. sp. (Schätti, 1985). The commonest lizard, as in Anatolia of nearby mainland Turkey, is *Ophisops elegans*, and *Coluber jugularis* (not included as such in Boulenger's (1910) list) is also very common on the island. *Vipera lebetina* is very common near Paphos, but *Natrix natrix*, through the use of DDT insecticide, probably became extinct in the 1960s. *Eumeces schreiberi* is now very scarce. The common chameleon is locally abundant and has even been found in the grounds of the Agricultural Research Station at Athalassa about 2km east of Nicosia. Populations of *Mauremys caspica rivulata* are low in number and occur in isolated waterholes of dry river beds (Demetropoulos & Hadjichristophorou, 1981). Attempts are being made to reintroduce the chelonian to pools where it once occurred by translocation from elsewhere on the island. Isolated specimens, probably introduced, of *Testudo graeca ibera* and *T. marginata* have been recorded since the 1970s. These species have probably arrived from Greece through translocation by Greek Cypriot residents and students, who attend universities there.

On a return journey from Tanzania and Kenya in December 1985, Lambert had the opportunity to visit Cyprus and meet Demetropoulos, who is Cyprus's delegate to the Mediterranean Action Plan of the United Nations Environment Programme. The Action Plan's coordinating unit is

based in Athens, and marine pollution and conservation of the coastal environment are two of its concerns.

At the present time, probably the most significant herpetological activity on Cyprus is connected with the project to conserve a breeding population of turtles on Cyprus's western coast at Lara, 22km north of Paphos (Fig. 1). Turtles are protected in Cyprus and the green turtle (*Chelonia mydas*) and loggerhead (*Caretta caretta*) breed fairly regularly on the island's beaches. Both were more abundant in the past. With a colleague, Merula Hadjichristophorou, in the Department of Fisheries of Cyprus's Ministry of Agriculture and Natural Resources, whose training was also received at the University College of North Wales at Bangor (specializing in marine biology), a conservation project was launched in 1978 and a hatchery set up to increase hatching success and survival (Demetropoulos & Hadjichristophorou, 1982). It is the first and only hatchery in the Mediterranean and Europe. Since 1980, the work has received substantial help from the World Wildlife Fund as IUCN/WWF project no. 1815. A station as a seasonal camp (Plate 1) has been set up at the Lara Reserve and the turtle populations are being studied through tagging and surveys and the restocking of the sea through hatchery work and head starting. Hatchery work includes collection of eggs and hatching by various methods, primarily by burying the eggs in the sand by the station beach, but also by laboratory hatching. Data on the environment, hatching conditions and hatchlings are also being collected. Natural nests in situ are being protected and where protection cannot be adequate, eggs are removed to the turtle hatchery at Lara. Since 1978, 3-4000 eggs have been collected yearly and hatching success is in the region of 75%, which although lower than in wild nests is many times the number that would have reached the sea from unprotected nests.



Plate 1. The observation station set up at the Lara Reserve for the Turtle Project, Cyprus (Summer 1985), looking inland

Using 1983's results as a case in hand (Demetropoulos, 1984), the breeding season started in early June and 43 nests with 4605 eggs were hatched under complete protection either at Lara in the sand, as laid by the female adult turtle, or in the laboratory. Of these, 16 were green turtle nests holding 2065 eggs while 27 were loggerhead's holding 2540 eggs. From these nests, 1650 green turtle hatchlings and 1901 loggerhead hatchlings were obtained, giving 79.9% and 74.8% hatching success, respectively. Another 284 hatchlings obtained from nests disturbed by foxes and collected for hatching were also released bringing the total number of hatchlings to 3835.

MONITORS IN SRI LANKA

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Water Monitor, *Varanus salvator*



Plate 1. Photographed on an estuary near Nugumbe, only a few hundred yards from a hotel, where they were regular scavengers. The monitors are most active early in the morning at about 6 a.m., when they can be seen swimming along river edges and estuaries hunting for small fish, or sometimes small birds. Towards midday, they tend to leave the water and bask in branches over the river bank. The Water Monitor is locally common in Sri Lanka: sometimes it is possible to see as many as 15 or 16 in a morning. Examples of 6 feet in length are frequent.

Bengal Monitor, *Varanus bengalensis*



Plates 3 and 4. Photographed in Yala, where it was sometimes possible to see seven or eight at once foraging on a plain of grass and purple flowers. The Monitors averaged 4-5 feet in length. An eagle was observed carrying off a young specimen. Monitors in Sri Lanka are not persecuted by man: there does not seem to be any human interference. They are also in good physical condition: they are generally healthy, heavily built and well nourished, even obese.



View from this side.

Plate 2. Photographed on a sea beach about twenty miles south of Colombo, where Green Turtles (*Chelonia mydas*) lay eggs during the night, and Monitors dig up the nests by day. Rangers transfer the turtle eggs to protected areas; the Monitors attempt to dig under the protective wooden barriers to reach the eggs.



Some nests were also transplanted from the North coast (Latchi-Polis) and those at Lara were left in situ unless endangered by being laid too low down on the beach.

Appreciating that incubation temperature determines sex in turtles, females, which are considered to be more important for population recruitment, were produced at 33°C in tanks in the Department of Fisheries's wet laboratory at Paphos in 1981 and on-growing of green turtles is carried out in cages in Paphos harbour.

Turtles from the Department of Fisheries in Nicosia (12 yearlings in 1979; six hatchlings in 1981) have also been loaned to the Marine Science Laboratories at Menai Bridge of the University College of North Wales for nutritional and oxygen consumption studies and the results have since been published (e.g. Hadjichristophorou & Grove, 1983; Davenport & Oxford, 1984), the background to this cooperative venture having been described by Dr John Davenport in *BHS Bulletin* No. 9: 15, June 1984.

Yearling turtles in their so called "lost year" do not seem to lose it in Cyprus and some yearlings and two-year olds have found their way into Paphos harbour and into fishing nets off the Paphos coast. This would seem to bode well for the future of *Chelonia mydas* in Cyprus, especially since patrols both by scientific and Law enforcement staff of the Department of Fisheries cover all of the west coast beaches and the Latchi-Polis area. The killing of a loggerhead in 1983 led to the Department of Fisheries carrying out long investigations, which although inconclusive prompted newspaper coverage.

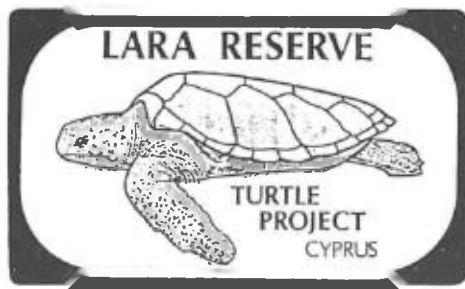


Figure 1. Logo sticker for the Lara Reserve Turtle Project on the west coast of Cyprus

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NOTES ON SOME FROGS OBSERVED IN WEST MALAYSIA

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From October 3-9, 1985 I photographed and observed frogs in and around the University of Malaya's Field Study Centre at Gombak. The area consists of lowland rain forest situated about 15 miles north of Kuala Lumpur, between the old road to the Genting Highlands and the new East — West Highway. Apart from primary forest, disturbed habitats are present alongside the old road, and a small river, the Sungai Gombak, and numerous small tributaries run through the area providing a number of distant habitats. Generally speaking, the rain forests of South-east Asia are poor in species compared with similar areas in Central and South America, but since several of the species observed will be unfamiliar, I feel that this note may be of some interest.

No specimens were taken (with the exception of some eggs — see below) and all identifications were made in the field using P.Y. Berry's 'The Amphibian Fauna of Peninsular Malaysia' — unfortunately, this proved inadequate when dealing with some of the small ranids and some of the identifications are therefore tentative: these species are asterisked in the following list.

Pelobatidae

Megophrys nasuta. This spectacular toad is an inhabitant of primary forest and is a classic and well-known example of disruptive camouflage. Three males were found, calling alongside a small forest stream. Calling begins at dusk, but only if rain has fallen, and continues sporadically for several hours, individuals spacing themselves at a distance of 20 metres or more.

Bufonidae

Bufo asper. Four of these large toads were seen. With the exception of one juvenile, all were found several feet above the ground: one on a large rock near the river; one on a palm frond and one on a tree-trunk. No calling was heard.

Bufo melanostictus. Heard calling in a pool alongside the old road. This common species is rarely found in natural habitats.

Bufo parvus. Several of these small toads were seen on the forest floor. In a small marsh near the old road, three males were calling from concealed places, e.g. beneath dead leaves. One of these was in amplexus with a female a little later.

Ranidae

Amolops larutensis. This species is adapted to living in torrents and waterfalls. The adults and juveniles have expanded discs on their digits and cling to wet rocks above the water; the tadpoles have an adhesive abdominal disc and graze algae just above and below the waterline of large boulders in mid-stream. All stages (tadpoles, juveniles and adults) were common along the Sungai Gombak.

Rana erythraea. A very common species in disturbed habitats. Numerous calling males were in the pool alongside the old road.

Rana hosii. Common alongside the river. One individual was found at night resting in a hollow tree-trunk several feet above the ground.

Rana doriae. A streamside species. Two 'phases' were seen, one with a broad cream vertebral stripe and one without.

*Rana laticeps**. A single male was seen, calling from a rock bordering a small stream which flowed beneath old road.

*Rana nitida**. Several males and females were seen in the marshy area near the old road.

Rana plicatella. A male and several females* were seen in the marshy area alongside the old road. Males of this species are remarkable for the bony knob protruding from their skull just behind the eyes. Its function seems to be a mystery. (See also note.)

Rhacophoridae

Polypedates (= *Rhacophorus*) *leucomystax*. Numerous in the pool alongside the old road: another species which appears to favour disturbed habitats.

Microhylidae

Kalophrynus pleurostigma. A single female was found under a dead leaf in a thicket of low shrubs. Many other toads, presumed to be of this species, were calling here and in similar situations elsewhere but were never tracked down despite many attempts. It seems that they call from hidden places, possibly burrows, and may spawn there also as water was not present in these localities.

Microhyla berdmorei. A single specimen was found in the toilet block of the field station. this is probably not its natural habitat.

Microhyla butleri. Numerous, but difficult to locate from its calls, in grassy roadside puddles alongside the old road, especially near the pool.

Microhyla heymonsi. Found with *M. butleri* but not so numerous and even more difficult to locate.

Note: In the marsh near the old road, several small (walnut sized) crater-like depressions were found in the mud, invariably under dead vegetation. In one of these a frog (possibly *Rana plicatella*) was disturbed but leapt away before it could be identified. Several others contained small quantities of spawn (about 20 eggs each). Some, which were beginning to disintegrate, contained newly hatched tadpoles. Two batches of eggs were collected and are being reared for positive identification. At present, a total of ten frogs have metamorphosed at a miniscule size.

Frogs observed in other areas of the peninsular

Pelobatidae

Leptobrachium hasselti. A single specimen of this strange orange-eyed spadefoot was found in an oil-palm plantation in Kelantan.

Megophrys longipes. A single calling male was found in a forest clearing in the Cameron Highlands, altitude approximately 5,000 feet. This species is believed to deposit spawn on moss etc. and the larvae undergo direct development. This ties in with the location of this breeding individual, where there was no free-standing water.

Bufo

Bufo melanostictus. Ubiquitous throughout the peninsular (and on Samosir Island, Sumatra), but only around human disturbance.

Ranidae

Amblops larutensis. Also found in the Cameron Highlands near a high waterfall.

Rana glandulosa. Numerous on the roads which crossed paddy fields along the east coast.

Rana hosii. Several were seen by day along a stream draining from Lake Cini.

Rana macrodon. A large specimen was found at night on the road below Tanah Rata, Cameron Highlands.

Rhacophoridae

Polypedates leucomystax. Ubiquitous, especially around disturbed habitats. A pair were found spawning above a concrete water tank (this is a foam-nest builder) very early one morning, near the Thai border, and remains of foam nests were found in several other similar situations elsewhere.

Rhacophorus bimaculatus. Several males and a female were found at night on the road below Tanah Rata, Cameron Highlands.

Microhylidae

Kaloula pulchra. One specimen found in a gutter in the town of Temerloh, many were calling vociferously beneath the 'rest' house near Jeli, and several were calling near a pool in the University of Malaya campus, Kuala Lumpur.

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CAPTIVE RIVER TERRAPINS OF A SUNDERBANS VILLAGE

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Situated at the mouth of the great rivers, Ganga and Brahmaputra is the vast, unbroken tract of mangrove forest that stretches for over 250km along the coast of West Bengal, in India and western Bangladesh. Called the Sunderbans, the region is remarkably underpopulated because of the highly saline soil and water, impenetrable forests that harbour wild animals sometimes destructive to crops, livestock and human lives, and a large number of rivers and creeks, which criss-cross the area, before draining into the Bay of Bengal. The northern parts are continuously being reclaimed for agricultural purposes, while new islands appear in the south.

Communication for the locals living in a number of islands in the Sunderbans is by boat. In the Indian Sunderbans, a 2,585 sq. km. area has been set aside as a Tiger Reserve, where human settlements are absent. Bands of fishermen, woodcutters and honey collectors enter the 1,255 sq. km. buffer area of the Reserve, after obtaining permits from the Tiger Project range offices. Outside the Reserve, in places the salinity is low, some agricultural activities are practised and human settlements appear.



Figure 1.
Map of the Sunderbans
of India, showing loca-
tion of Kumirmari
village.

Found within this unique wetland is the river terrapin *Batagur baska*. This species attains a large (60 cm) size and has for long been an important source of protein for the local people. Over a hundred years ago, Edward Blyth, then Curator of the Museum of the Asiatic Society of Bengal at Calcutta, reported that the species was abundant at the mouth of the Hooghly and significant numbers were brought to Calcutta for food. However, as a consequence of overexploitation and excessive habitat alteration, the once large river terrapin population suffered a decline that was so drastic that the species was no longer reported from the Indian subcontinent in this century, and coupled with political upheaval in the region, this unusually important animal, long the source of soup and soap, was forgotten. Considered extinct in this part of its range, the river terrapin does not figure in the Indian Wildlife (Protection) Act of 1972, which covers threatened species. However, at the turn of this decade, several river terrapins were found in village ponds, in the Sunderbans of India and reports of the species being caught in adjacent Bangladesh began to appear. Recognising the potential of the river terrapin to provide a cheap, protein-rich food to the Southeast Asian people, the IUCN Red Data Book listed the species as endangered, while the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

classified it under Appendix I, indicating that the river terrapin is threatened with extinction and international trade is prohibited. Conservation action for the species was also given highest priority status by the IUCN/SSC Freshwater Chelonian Specialist Group.

Conclusions derived from a survey of turtle markets of the Sunderbans are that the turtle resource of the region is greatly depleted, as it is elsewhere in the state of West Bengal, primarily due to their use as food. Freshwater turtles arriving at the local markets of the Sunderbans, during winter and early summer, are largely from the neighbouring states. Entry is through Howrah, the country's largest turtle market, situated adjacent to the city of Calcutta. A large number are also smuggled across the border from Bangladesh as the principal religion in that country, Islam, prohibits the consumption of turtle meat.

The river terrapin is referred to as 'katha' in the Sunderbans of West Bengal. In a number of large, slightly brackish ponds, often choked with vegetation, pet terrapins are doing remarkably well. Keeping pet terrapins is clearly the hobby of the few who are comparatively affluent. Besides the aesthetic pleasure of watching these large, graceful animals swim, feed and bask, owners demand nothing else in return. Terrapins may live long in captivity. Particularly interesting is a large (approximately 50 cm) specimen, which was reported to have been kept for about 22 years. When it hatched out of an egg collected from a Sunderbans seabeach it was then the size of a 50-paise coin. Though illegal, egg-collection sometimes takes place from a number of seabeaches and sandpits bordering the Bay of Bengal, between November and March, for food or to be hatched artificially. Specimens may also be obtained by the villagers from fishermen, when caught in 'baghda-jal' a long funnel-shaped net used in catching the tiger prawn *Penaeus monodon*. The wide mouths of these nets are strung between two long poles anchored in the river bottom, so that terrapins entering the open end become entrapped.



Plate 2. A river terrapin pond in Kumirmari showing the dense aquatic vegetation near the banks.

Captive specimens are shy, non-aggressive and highly aquatic, rarely if ever wandering far from ponds where they are kept and never leaving for similar bodies of water or escaping into the nearby creeks and rivers. In winter, terrapins bask on the banks or on floating tree-trunks. During the dry months in April and May, when the water level decreases, captive terrapins evidently undergo brumation, burrowing into the mud at the pond's bottom and becoming inactive till water level rises at the advent of monsoons. Small specimens are sometimes maintained by the owners in large earthen jars during the summer months to prevent predation by mongooses and monitor lizards. River terrapins living in village ponds graze on the aquatic vegetation growing abundantly in their artificial home, including the water bindweed *Ipomoea reptans* and dog grass *Cynodon dactylon*. Also accepted in captivity are prawns and what appears to be a great favourite, the red flowers of hibiscus.



Plate 1. View of mangrove vegetation of the Sunderbans.

The wild population of the river terrapin in the Sunderbans of India, however, is small, possibly as a result of continued overexploitation and high salinity of water. Bangladesh Sunderbans appear to have a larger population of terrapins, perhaps because the area receives a greater inflow of fresh water, and is therefore less saline. Though some numbers are caught in this part of the Sunderbans, human pressures should not be as great as in Bengal where turtle meat is considered a delicacy and no religious beliefs are strong enough to save them.

Nesting takes place during the winter, on deserted beaches and sandspits of the Bay of Bengal, along with the olive ridley *Lepidochelys olivacea* which migrates to the Sunderbans for that purpose. Though most of the present day nesting areas of both these species fall within the core area of the Tiger Reserve where human interference is banned, nests continue to be robbed by man. Another significant number of nests are destroyed by natural predators, such as wild boars and water monitors. Although adult terrapins are still caught both in offshore and tiger prawn nets, fishermen report a decline in population in recent years.

To bring back what was once an important part of the diet of the local people requires concerted effort on the part of the forest department, research workers, wildlife managers and the local people. Measures in this direction include enforcing existing legislation by preventing the intentional capture of turtles and collection of turtle eggs. Hatcheries could be established, perhaps using the captive stock already available, as it creates no further drain on the wild population. The usual precautions should be taken, such as avoiding production of unnatural sex ratios of hatchling turtles by carefully controlling the incubation temperature, and resisting the often strong desire to keep hatchlings for 'head-starting' (as it is possible that with age the natural instincts which may help young turtles become imprinted on some of the beach characteristics, may disappear). Further research on the species is needed, which will throw light on many poorly understood aspects of the river terrapin's biology.

Education programmes are of especial importance. If locals can be convinced of the need for conserving an important protein source and enlisted in its protection, what could be better?

The author's survey of the river terrapin in the Sunderbans of India was supported by the World Wildlife Fund — India. Many persons and institutions have contributed to this study for which he is grateful, including Dr. Edward O. Moll, IUCN/SSC Freshwater Chelonian Specialist Group for his advice and encouragement throughout the project, Ms. Bonani Kakkar, Project/Education Officer, WWF-India (Eastern Region) for getting the survey started, Mr. Jonathan Rao for photographic assistance and the West Bengal Forest Department for providing the logistical support.

A NOTE ON THE "WHISTLING FROG" IN CAPTIVITY

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Eleutherodactylus johnstonei (Barbour, 1914), is a member of the Leptodactylidae, and is native to the numerous islands of the West Indies, for example, Antigua, Barbados, and Martinique. It is a small, plainly coloured species, the females up to 2.5cm in length, the males slightly smaller. However, it is fair to say that what it lacks in size, it more than makes up for with vocal prowess. In fact, it is rumoured that a remarkably similar species, *E. martinicensis*, was introduced to Barbados by an irate local to annoy a neighbour, with whom he was no longer on speaking terms. Anybody who has heard these anurans calling can easily understand why they could be an annoyance!

An interesting aspect of their life history, along with many other *Eleutherodactylus* species, is that they are terrestrial breeders, i.e. the larvae complete the cycle on land, bypassing a free swimming tadpole stage. Few eggs, (each of about 4mm diameter), are laid on damp soil, (Plate 1), and development of the young frogs occurs within the egg, until fully formed froglets emerge, using their egg tooth, and are immediately ready to feed. The only major hazards facing the developing young in the egg are dessication and fungal attack. Both are prevented to a certain degree by the parent, in choice of egg laying site being clean and free from spores, and the presence of the male remaining with the eggs to moisten them with a watery excretion should they become too dry.



Plate 1. View of egg cluster at 7 weeks. Close examination of the top egg will reveal two hind limbs of the developing froglet

I happened to have my first experience of these animals in September of 1985 when a rather dry, neglected vivarium of size 48 by 15 by 12 inches, was given to me to maintain in our department foyer. At that time it contained 5 unknown frogs, (*E. johnstonei*), and a large female Warty newt, (*Triturus cristatus*), all huddled together in the only moisture available, underneath the empty water tray. The newt was released into a pond containing a breeding population, the frogs transferred to a temporary holding tank whilst the other was cleaned out. Fresh soil, plants (including 'Maidenhair' and *Nephrolepis* sp. ferns), logs, water container were added, and a layer of muslin was placed across the top of the tank, under the tube, to reduce the light intensity.

Although no heater was installed the tank remained at the temperature of the foyer, (about $23^{\circ}\pm 2^{\circ}\text{C}$), and the animals were fed a constant supply of *Drosophila*, and various other invertebrates.



Plates 2 and 3. Adult female *E. johnstonei*

After a period of about 2 to 3 weeks in their new, damp environment, the males were heard calling. This only occurred at night at what appeared to be a regular calling site, on the leaves of an exposed fern about 6 inches off the tank floor. No amplexus was observed, and it was assumed none had occurred. However, on the morning of February 25th 1986, a small, (5 to 6mm), froglet was found drowned in the pool, which was then lowered to make it very shallow, and a search of the tank was undertaken. This revealed a further two froglets and a clump of approximately 15 to 20 fresh, unpigmented eggs laid under one of the logs. Bayley (1950) states that *E. martinicensis* froglets hatch after 10 days, however, the eggs in my care took just over 8 weeks, to eventually hatch on the 18th April. The froglets remained hidden and secretive until a week after hatching, and were 2 to 3mm long. Contrary to the adult behaviour, the froglets were not nocturnal and were often seen foraging during the day. Being so small they could not eat the adults' food and were fed on invertebrates contained in floor sweepings from a nearby copse. The two older froglets were now 6 to 7mm long, and could be sexed via their markings, which corresponded with the adults. (Females being a drab, uniform, light brown, (Plates 2 and 3), the males having a darker, dorsal stripe extending from the midline of the eyes to the vent, (Plates 4 and 5)). It is hoped that these juveniles will grow to a breeding stock.



Plates 4 and 5. Adult male *E. johnstonei*

In order to maintain these amphibians in a healthy condition with the ultimate view to breed, the following is worth remembering:

1. The frogs must feel comfortable in their tank, and this is best achieved by emulating their natural conditions. In this case it involves a vivarium with shaded light levels, a variety of hiding places, damp soil, (a shallow water container can be added, but it is not essential), correct temperature of about 23°C, and a plentiful food supply. However, it must be realised that as these are nocturnal animals, and if sufficient hiding places are available, you are unlikely to see them at all during daylight hours, and any forced exposure to daytime activity will decrease the chances of breeding.

2. During the night period *E. johnstonei* is a very active and agile animal. It is, therefore, essential that a secure, tight fitting lid is used, otherwise escapees will be inevitable!

3. The natural breeding season on the islands is the rainy season between April and May, the stimulus being an increase in humidity and rainfall. This can be mimicked in the vivarium by periods of relative dryness, lasting about three months, interspersed with a wetter period involving regular spraying with de-chlorinated water to increase the humidity.

4. If the eggs are obtained it is a good idea to transfer them to a rearing tank, in case the adults eat the emergent froglets.

It is hoped that this may be of small benefit to anyone who has these, or similar, animals but is unsure of their requirements and habits.

I would like to thank Brian Banks, Colin McCarthy, and Ron Long.

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NOTES ON THE REPTILES AND AMPHIBIANS OF EPPING FOREST, PAST, PRESENT AND FUTURE

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INTRODUCTION

Changes in land use patterns in eastern England in the last few decades have had a significant effect on reptiles and amphibians, in nearly all cases a negative one. Pasture lands with cattle and horse ponds have been turned to intensive arable use, and the ponds filled in or neglected now that they no longer have a part to play in the agricultural economy. Thus the Great Crested Newt, a characteristic inhabitant of small ponds in pastureland, has lost many populations. Some areas of heath and scrub have either been reclaimed for agriculture or parkland or reverted to dense woodland unsuitable for reptiles. Much land has also been lost to urbanisation, especially in south Essex, where there has been a great increase in the human population. With these changes, which are unlikely to be reversed, Epping Forest has assumed a greater relative importance as a reservoir of wildlife than in the past.

Epping Forest, about 6000 acres in extent, is situated in the south west corner of the county of Essex, and the adjacent borough of North East London. The Forest has been protected by a special Act of Parliament, the Epping Forest Act, since 1878, making it one of the oldest natural protected areas in the county. It is owned and administered by the Corporation of the City of London, who are the Conservators of the Forest. The Act requires that the "Conservators shall at all times as far as possible preserve the natural aspect of the Forest ... and shall protect the timber and other trees, pollards, shrubs, underwood, heather, gorse, turf and herbage growing on the Forest ..." Though the Forest is therefore in effect a nature reserve, yet the Act, importantly, also lays down that "The public shall have the right to use Epping Forest as an open space for recreation and enjoyment". The Forest has an enlightened management, under the Superintendent and his staff. Management is a particularly difficult task, in view of the many interests in the Forest which must be balanced.

Physically, the Forest is a ridge with a NE-SW trend. It is based on the London clay, overlain on the ridge by Claygate Beds, capped in the higher parts by Bagshot Sand and Pebble Gravel. The southern areas, around Wanstead and Leytonstone, are on the flat, gravelly Thames terraces.

The dominant climax vegetation today is composed of Beech (*Fagus sylvatica*), Oak (*Quercus robur*) and Hornbeam (*Carpinus betulus*), with Beech predominating in the central ridge of the Forest and Oak on the lower-lying clay areas elsewhere. Depending on soil types, the Silver Birch (*Betula pendula*), Hawthorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*) are invasive on the old open plains, and form dense continuous thickets, later shaded out by the larger trees.

The plains on London clay have a rich vegetation of meadow grasses and herbs typical of rough pasture on neutral soils, with scattered thorn and oak scrub increasing to form a closed canopy.

The plains on the poorer and more acid gravels and sands of the ridge bear a wet heath vegetation characterised by Crossed-Leaved Heath (*Erica tetralix*), Heather (*Calluna vulgaris*), Purple Moor Grass (*Molinia caerulea*) and Fescue Grass (*Festuca*), now heavily invaded by birch and oak scrub, to the extent that most are really open oak-birch woodland rather than heath.

The Forest is particularly rich in ponds, on a variety of soils and with a great variety of vegetation. This is one of the most important aspects of the Forest.

THE FOREST AS AN ENVIRONMENT FOR REPTILES AND AMPHIBIANS

The first and only systematic survey of the reptiles and amphibians of the Forest was made by Wheeler, Malenior and Davidson in 1958. Further notes were published by Malenior in 1963 and by David Scott in 1979. Malenior and Pickett made a survey of a particular population of Adders in 1967/68. These notes are based on personal observations and those of friends in the period

from about 1965 to date. They are not intended to be either comprehensive, systematic or complete, and there are large gaps in my knowledge, particularly of the reptiles of the southern part of the Forest, and that part north of Epping. I hope it will be possible in the near future to make an extensive and thorough survey, to complement that made in 1958.

Main areas inhabited by reptiles

The most important sites for reptiles are in the main body of the Forest north of Loughton, chiefly on the Plains. In the last 20-30 years, most of the open plains have reverted to dense closed-canopy woodland, and the reptiles have gone or have been reduced to small, relict populations. A few years ago, the situation was very bad, and the Adder and Slow-worm seemed to be on the point of extinction, with the status of the Grass Snake and Common Lizard little better. However, because of the enlightened attitude of the Forest authorities, and the efforts of the Epping Forest Conservation Volunteers, the Epping Forest Conservation Centre, and members of the British Herpetological Society, several of the old plains are being restored to their original condition, and reptile populations are rising.

Restoration work began on Deer Shelter Plain. Once an area of open wet heath on level ground, this is now a quite beautiful birch wood, with some oak and remnant heath. In the 1950's and 60's it supported large populations of Adders, Grass-Snakes, Common Lizards and Slow-Worms. All of these species still exist there today in small numbers. Selected favourable areas are being thinned of scrub and extended to recreate good habitat for reptiles, invertebrates and heathland plants, while maintaining the attractive nature of the birch woodland. Deer, absent for some years, now visit the plain again, perhaps because of grazing and cover provided by the new rank growth of heathland vegetation and bracken. The reptiles have responded rapidly to the clearing, and numbers have begun to rise.

The Long Running is similar in character to Deer Shelter Plain. It is a fairly extensive area of open birch-oak woodland with areas of heath, mostly level and waterlogged and with a mosaic of small old pits and banks filled with water in winter, once gravel workings. There is a bomb crater from the Second World War, now an attractive small pond with a great population of Palmate Newts and Common Toads. In recent years, the Epping Forest Conservation Volunteers have cleared areas of birch scrub in the Jack's Hill area and around the pond. These areas support quite good and stable populations of Adders and Common Lizards, with some Slow-Worms and Grass Snakes. It is an important site.

Sunshine Plain is the third area of wet heath in the Forest. It is level and waterlogged. It has a well developed heath vegetation dominated by Cross-Leaved Heath and Purple Moor Grass, and rich in insect life. Some years ago in danger of reverting to woodland, it has now been completely cleared, and is closely managed by the Epping Forest Conservation Volunteers. It has a fair population of Grass Snakes, which has recovered since clearance and the thinning of the adjacent woodland. It is the stronghold of the Common Lizard in the Forest. Strangely, Adders and Slow-Worms have never established themselves here.

The fourth site of importance for reptiles is Birch Wood. Completely different from the heathland plains, this is a hillside on London Clay facing south-west, with rich soil and a vegetation of meadow grasses, herbs, bramble, Hawthorn, Blackthorn, Crab-Apple, Oak, and Birch (in parts). Invasion by thorn scrub and oak has been severe, and the populations of reptiles were almost extinct three years ago. Scrub was thinned in 1967-69 by members of the British Herpetological Society and Essex Field Club, and each winter since 1983 by the British Herpetological Society and Epping Forest Conservation Volunteers. Work will continue for years to come and has now probably progressed just far enough to save the tiny remnant populations of Adder, Grass Snake, Common Lizard and Slow-Worm. The south-west aspect, rich soil and abundant food made this an especially favourable locality for reptiles in the past. A very large population of Adders lived here. One day in 1967, when it was already in decline, I counted 32 snakes. Common Lizards and Slow-Worms also existed in good numbers. Grass Snakes, because of a lack of amphibian prey in the area, have never been abundant. It is also rich in bird, mammal and plant life, dependent like the reptiles on the continued existence of open grassland and scattered thorn bushes.

The extensive areas of grass, marsh and thorn scrub on the low-lying clay plains of Fairmead and Chingford are generally inhabited only by Grass Snakes, though Scott mentions records of

Common Lizards and Adders on Whitehouse Plain, which is continuous with Fairmead. These plains have never been intensively surveyed.

In the south, Wanstead Park assumes some importance. Despite being situated well inside suburban London and visited by large numbers of people, there are still Grass Snakes and Common Lizards and quite large populations of amphibians.

There are a number of small plains in the northern Forest which may still harbour some reptile life. Debden Slade, a small area of rough grass in a valley bottom, a delightful spot, still holds a small population of Grass Snakes, able to survive here because of recent thinning of invading oak scrub. Twenty years ago, when the area of open ground was more extensive than today, the Grass Snake population was unusually dense.

Several other plains have gone entirely, or at least are no longer able to support reptiles. These include Wake Valley, Rushey Plain, Broadstrood, Copley Plain, the Furzeground, Sandpit Plain, the marsh around Lower Goldings Hill Pond, the slopes of Baldwins Hill and Woodbury Hollow. Notable among these are Broadstrood and Wake Valley, which were very interesting areas of rich, diverse marshland, with some adjacent drier open woodland and patches of heath. I remember them as being unique in the Forest. They held large populations of the four species of reptiles. Today they are gone entirely, but perhaps they can be recreated with some effort, and it is my hope that the Conservators may undertake this task. Baldwins Hill and Woodbury Hollow were partially cleared after the reptiles were extinct and the best part of the slope of Baldwins Hill remains as dense secondary woodland. Woodbury Hollow was once a heather-covered hillside — unusual because it is on London Clay — and supported unusually large populations of Grass Snakes and Common Lizards. Copley Plain and the Furzeground, small plains set in surrounding woodlands, have recently been thoroughly cleared by the Conservators. Picturesque in aspect, on dry hillsides of grass, bracken, a little heath and honeysuckle, their animal life has gone, but they will no doubt be recolonised in time, and their restoration is heartening.

The Forest Rides, notably the Green Ride and Clay Road, have also been cleared to some extent of invading trees. Grass Snakes are found occasionally along the rides, but their grassy margins are more important as a summer habitat for amphibians. Numbers of frogs and toads can be seen along the rides on summer evenings. Affording cover and food, the rides are preferred as a habitat to closed-canopy woodland, especially by frogs.

The Forest Ponds

There are many ponds of many types in the Forest, supporting large amphibian populations. The most important ponds are best described individually. In the northern part of the Forest are the Goldings Hill Ponds, Blackweir or Lost Pond, Baldwins Hill Pond, Wake Valley Pond, Little Wake Valley Pond, Wake Valley Bomb Crater, Earls Path Pond, Strawberry Hill Pond, Fairmead Bottom Pond.

Goldings Hill Pond is a shallow pond with rich marginal vegetation. In recent years the marsh and leaf fall extended to almost fill the pond; it was partially cleared in 1985. It supports a very large colony of Common Frogs and good numbers of Smooth and Palmate Newts. Common Toads ceased breeding in the pond several years ago when it became too weed choked and sedimented.

Lower Goldings Hill Pond is smaller but deeper, now badly sedimented and shaded by invading scrub. It was once situated on an open green. Twenty years ago Grass Snakes were abundant in the *Juncus* marsh around the pond. In earlier days, Lizards and Adders were also found. Toads and frogs stopped breeding here a few years ago. I do not know if there are still breeding populations of newts: this was one of the few ponds with a colony of Great Crested Newts.

The bomb crater on Long Running, small but deep and well vegetated with *Potamogeton* and a little *Glyceria fluitans*, is the home of a very large population of Palmate Newts and Common Toads. Common Frogs occur in small numbers. Wake Valley Pond is large and deep, slightly acidic around the margins, fringed with *Sphagnum* beds and Common Reeds (*Phragmites*); the aquatic vegetation consists of *Potamogeton* and Yellow Lilies (*Nuphar lutea*). It supports the largest breeding colony of Common Toads in the Forest; the numbers of Common Frogs breeding are also high. I assume there are reasonable numbers of Palmate Newts. Blackweir

Pond is a beautiful old gravel working, now blended perfectly into the forest. It has a wonderful growth of the uncommon Water Violet (*Hottonia palustris*), the flowers of which form a blue haze over the water in May and June. There is a dense growth of *Potamogeton natans*. Around the margin are clumps of Yellow Flag (*Iris pseudocorus*), Float Grass (*Glyceria fluitans*) and a small bog of *Sphagnum* and Willow (*Salix*) at one end. It holds good numbers of Common Toads, Common Frogs and Palmate Newts. Crested Newts have been found here in the past. Baldwins Hill Pond, formed by the damming of a stream by the Clay Ride, is another rich pond. It is on the London Clay, and like Blackweir Pond has a fine growth of Water Violet and Floating Pond Weed. Its marginal vegetation consists of beds of Yellow Flag, Reed Grass (*Glyceria maxima*) and Float Grass (*Glyceria fluitans*). There are large breeding populations of Common Toads, Common Frogs, Smooth Newts and Palmate Newts. Unfortunately this beautiful pond is being steadily infilled by leaves and sediment washed in by the inflowing stream. It is now possibly half of its original size. Unless it is cleared at one end (hopefully before its established flora and fauna are drastically altered), it will be lost. Earls Path Pond, somewhat similar in nature and situation to Goldings Hill Pond, was a few years ago badly sedimented. It was restored by the Epping Forest Conservation Volunteers, but unfortunately the good growth of Water Violet disappeared after clearance, and has been replaced by a vigorous and dense growth of Canadian Pondweed (*Elodia canadensis*). The amphibians, however, have benefited from the cleaning, and there are good and successfully reproducing populations of Common Toads, Common Frogs, Smooth and Palmate Newts. Some Water Soldier (*Stratiotes aloides*), previously absent, has colonised the pond. The nearby Strawberry Hill Pond is similar in aspect to Blackweir Pond, being a gravel pond with, once, almost identical vegetation, apart from there being more stands of Willow. It was cleared with Earls Path Pond a few years ago, but unfortunately in the same way the Water Violet was destroyed, strangely not replaced by any submerged plant. There are large colonies of Common Toads, Common Frogs and Palmate Newts.

A short distance away but on the low-lying Fairmead Bottom, is Fairmead Bottom Pond, a rich pond on the London Clay, well vegetated (a little too much) with Canadian Pond Weed, Water Violet, Floating Pond Weed, Reedmace, Float Grass and Water Soldier (a new coloniser). There are thriving colonies of Common Toads, Smooth and Palmate Newts, a very small number of Common Frogs and possibly Crested Newts. Little Wake Pond, with a good colony of Common Toads, is unusual in the Forest in that its submerged vegetation consists of a good growth of Bladderwort (*Utricularia*) and Water Milfoil (*Myriophyllum*). Knighton Wood Pond is an ornamental pond fringed with Common Reeds and Reed Grass, and an aquatic vegetation of Lilies. It has large colonies of Common Toad and Common Frog. Further south in suburban London are the Oak Hill Ponds, a small cluster of small ponds on London Clay of varied character, some open and well vegetated, some shaded. Collectively they support a great population of Common Frogs, some Toads, Smooth and Palmate Newts. Bulrush Pond has a moderate population of Common Toads, and a very large one of Frogs. The ponds on Leyton Flats have small colonies of Common Frog, but no toads; the newts have not been surveyed. Wanstead Park has four large ponds of an ornamental character. There is a great deal of human disturbance in the park, situated as it is in east London, yet there are large populations of amphibians. Common Frogs are abundant, and each pond has several spawn sites. Common Toads are said to be common, but I have not had the opportunity to make any observations. Smooth Newts and Great Crested Newts are common.

SPECIES ACCOUNTS

AMPHIBIANS

Common Toad, *Bufo bufo*

The Toad is abundant and generally distributed in nearly all parts of the Forest. Its population has remained fairly stable over the years, and no doubt its numbers today are not much different from what they were a hundred years ago. It prefers larger, clean ponds for breeding. The sedimentation of some ponds, such as Goldings Hill Ponds, has rendered them unsuitable for it. Its breeding success varies from year to year, for no obvious reason. In some years, such as 1985 and 1986, enormous numbers of recently metamorphosed toads could be seen in July and August in the woods around the Wake Valley Ponds and in Monk Wood, and no doubt there

were similar numbers elsewhere. Occasionally there are so many tadpoles in the ponds that there is insufficient food, and sometimes this results in catastrophe, with the death of all the tadpoles. I have witnessed this regularly in the bomb crater on Long Running, and in 1986 in Strawberry Hill Pond. The largest single breeding population of toads in the Forest is in Wake Valley Pond; being large, clean and deep with little disturbance, it is ideally suited to them. Other breeding sites of which I am aware are the Long Running Bomb Crater, Wake Valley Bomb Crater, Little Wake Pond, Blackweir Pond, Baldwins Hill Pond, Earls Path Pond, Strawberry Hill Pond, Fairmead Bottom Pond, Warren Pond, Knighton Wood Pond, the Oak Hill Ponds, Bulrush Pond and the Wanstead Park Ponds.

Common Frog, *Rana temporaria*

In 1958 the Frog was uncommon in the Forest. Wheeler et al say of the amount of spawn: "In each case the quantity found was small, probably the product of two or three females". Since then, the population has dramatically increased, and in some ponds up to 1000 clumps of spawn may be laid in one season. The reasons for this increase are obscure. In certain cases it may be due partly to human intervention: the amount of spawn being very small and laid in vulnerable positions by the bank, most of it was collected by children, who in these circumstances were very serious predators, so for a number of years after 1958 members of the Essex Field Club systematically moved spawn found to better hidden, less vulnerable spots in the ponds. Already, in 1965, I counted about 300 clumps of spawn in Blackweir Pond; in 1958 there were only two. However, the activities of Field Club members were restricted to the northern part of the Forest, so would not explain the very large population in ponds in the urban districts in the south, where human pressure is great. Today the populations are of such size that they are not affected by the depredations of children — only a small proportion of the total amount of spawn is taken. Considering the educational value of children rearing tadpoles, and the enjoyment they obtain from it, it is not a bad thing.

The quantity of spawn laid varies from year to year. It is greatest after severe winters: the more severe the greater the amount of spawn. Cold winters do not seem to damage the frog population in any way: quite the opposite. In most ponds the amount of spawn varies between about 50 and 200 clumps. In some ponds 300-500 clumps are normal, with larger quantities occasionally. The most unusual site is a roadside marsh near the Oak Hill Ponds, the dominant vegetation of which is Float Grass. The marsh is water filled in winter and spring, but always dries up in late spring or early summer. However, the numbers of frogs breeding here are perhaps greater than anywhere else in the Forest, with up to 1000 clumps laid in one year (exceptional).

In summer, the Frog prefers to live in open grassy areas rather than dense woodland. Perhaps for this reason it is most abundant in the southern parts of the Forest where there are extensive open areas. In the northern part of the Forest it lives along the rides, on the plains, in open woodland, and gardens bordering on the Forest.

Breeding sites that I know of are Goldings Hill Pond, Long Running Bomb Crater, Wake Valley Pond, Wake Valley Bomb Crater, unnamed pond across Epping New Road, from Little Wake Pond, Blackweir Pond, Baldwins Hill Pond, Earls Path Pond, Strawberry Hill Pond, Fairmead Bottom Pond, Connaught Waters, Warren Pond, Oak Hill Ponds and Marsh, Highams Park Lake, Bulrush Pond, Eagle Pond, Hollow Pond, Whips Cross Corner Pond, Wanstead Park Ponds.

Smooth Newt, *Triturus vulgaris*

The Smooth Newt is common in the Forest, preferring ponds on clay. It can generally be assumed to occupy all the ponds except those on more acidic or gravel soils in the northern part of the Forest, where it may be absent or rare. Such is the case in the Long Running Bomb Crater, where only the Palmate Newt breeds.

Palmate Newt, *Triturus helveticus*

The Palmate Newt is most common on the gravel soils of the northern part of the Forest, but has been found as far south as the Oak Hill Ponds, and is said to be common in Knighton Woods/Lords Bushes. It seems to prefer slightly acid soil conditions, and possibly for this reason is most abundant in the Long Running Bomb Crater. It probably occurs in all ponds in

the northern part of the Forest but, apart from those already mentioned, I know it from Goldings Hill Pond, Blackweir Pond, Baldwins Hill Pond, Wake Valley Pond, Earls Path Pond, Strawberry Hill Pond, Fairmead Bottom Pond, "Speakman Pond" (a temporary marshy pond at High Beach).

Great Crested Newt, *Triturus cristatus*

This species has never been common in the Forest, surprising in view of the number of large ponds. This, no doubt, is because the newt does not favour woodland habitats. Elsewhere in Essex it is a characteristic inhabitant of semi-permanent ponds or dykes in rough pasture, usually well vegetated with Float Grass. Those parts of the Forest where it lives are not dissimilar: it has been found in the small grassy craters of Chingford Plain and Fairmead Bottom. It also colonises ornamental ponds. In 1964/65 some hundreds were removed from an artificial pond, about to be filled in, in the gardens of a house on Baldwins Hill. A few years ago quite large numbers were taken by the Epping Forest Conservation Volunteers from an old swimming pool, again due for filling, at the Kings Head, High Beach. Such instances, coupled with the occasional finding of juvenile specimens under logs in various parts of the Forest, may indicate that it is more common than we believe. The Forest ponds are large, often deep, and difficult to survey. A secretive deep water species like the Crested Newt is difficult to find.

The most surprising population of this newt is in Wanstead Park, where it appears to be common. Chris and Carol Picton saw them frequently in a pipe connecting two ponds, and in the Heronry Pond in 1986. Denis Lee reports that it bred in large numbers in Heronry Pond some fifty years ago. It is impossible to obtain an accurate picture, as the ponds are so large, with so many islands, inlets, and so much open water that they would be extremely difficult to survey.

Within the last twenty years specimens of the Crested Newt have been seen in Lower Goldings Hill Pond, Blackweir Pond, Fairmead Bottom Pond, craters on Fairmead Bottom, a small pond and ditch on Chingford Plain, and in Wanstead Park. A comprehensive survey is needed for this species.

REPTILES

Common or Viviparous Lizard, *Lacerta vivipara*

In the 1958 survey this lizard was found to be abundant and widespread throughout the northern part of the Forest, on all the plains and clearings. Regrettably, it is far less numerous today. The loss of so much open space to invading woodland has reduced the lizard population to a fraction of what it was. Under favourable conditions it could be extremely abundant; I never attempted to quantify it, but in certain spots the densities seemed incredible. Such a spot was a small clearing of bracken, honeysuckle and grass near Birch Wood, where scores of pregnant females could be seen basking along the sides of paths. Today there are none. Other places in which I knew it to be abundant but from which it has gone are Broadstrood, Baldwins Hill, Woodbury Hollow, Wake Valley Plain, Copley Plain and Dulsmead Hollow. No doubt there are many other places from which the lizard has gone. It still occurs on Deershelter Plain, Long Running, Sunshine Plain and probably Birch Wood and High Beach. Its stronghold is Sunshine Plain, where it is still numerous. I have no information on the lizard's occurrence in the southern part of the Forest.

The dominant colour phase of the lizard in the Forest is a pale, plain brown, which blends perfectly with leaf and bracken litter.

Slow-Worm, *Anguis fragilis*

George Malenoir and John Davidson, from 1958 to the early 60's, found the Slow-Worm common on Baldwins Hill and Broadstrood, with occasional specimens elsewhere. Baldwins Hill was its stronghold. On warm evenings in the 1960's, when I was a boy, it was the habit of my schoolfriends and I to look for Slow-Worms after school; we invariably found them, moving slowly through leaf litter beneath bushes, or, often, on the Fescue-covered mounds of the Yellow Ant. Invading dense thorn and oak scrub quickly made Baldwins Hill unsuitable for Slow-Worms, and I have not seen one for 15 years. Broadstrood has also gone. I see it quite frequently on Deer Shelter Plain, and occasionally on Long Running and at Birch Wood. It may still occur at Paul's Nursery, an old haunt. The Slow-Worm is a secretive animal, and is usually only seen in

numbers under certain weather conditions; its presence may go undetected for many years. Though it is certainly not abundant in the Forest, it may yet be discovered in new areas.

Grass Snake, *Natrix natrix helvetica*

The 1958 survey found the Grass Snake common and widespread in the northern part of the Forest. It is still widespread, but in much smaller numbers. Many places where it was common have now been lost to invading woodland. Such places are Strawberry Hill, Woodbury Hollow, Baldwins Hill, Lower Goldings Hill Pond, Broadstrood and Wake Plain. Formerly abundant on Deer Shelter Plain, it almost died out, but since clearance work there is increasing again. It was also abundant in Debden Slade, but again almost died out because of encroaching woodland; a small population has survived as a result of clearance. It occurs on Long Running in small numbers, but has never been very common there in spite of suitable habitat. It is frequently seen on Sunshine Plain. It is common on Fairmead Bottom, and I suspect also in the adjacent open woodland and Whitehouse Plain. In these quite extensive open areas its numbers are probably stable. Graham Walters has found specimens in Wanstead Park in recent years, and I have heard of other reports from there.

The Grass Snake is a wandering animal which will rapidly colonise favourable areas, and is able to live in open woodland. The recent extensive pollarding in Debden Slade, along Loughton Brook, and Hangboy Slade has created new open areas which I believe will provide good habitat and avenues of dispersal.

Adder, *Vipera berus*

Since the 1960's, the Adder, once common in a few places, has declined considerably. Without recent efforts to restore some of the plains it would probably now be extinct or almost so. In 1958 the Adder was found on Deer Shelter Plain, Long Running, Wake Plain and Birch Wood. Specimens released by Fred Speakman colonised Rushey Plain. I found it to be common during the 1960's on Broadstrood. John Davidson recalls Adders being found before the 1939-45 war on Sandpit Plain, a heather covered slope near Baldwins Hill, around Lower Goldings Hill Pond, and the Furzeground. Today small colonies of Adders survive on Deer Shelter Plain, Long Running and Birch Wood. The reasons for the Adder's decline is, as for the other reptiles, the loss of open space to rapidly encroaching secondary woodland. The Adder prefers areas of ungrazed grassland with scattered bushes (as at Birch Wood) or mixed heath, grass and open woodland. It is not averse to living in quite marshy areas such as Wake Valley Plain and Broadstrood. Where food is abundant it can maintain dense populations: there were probably at least 100 living on the grass covered slope of Birch Wood in the early 1960's. There are probably no more than 6 or 8 today.

Clearance of invading scrub on Deer Shelter Plain, Long Running and Birch Wood has enabled the Adder to survive in the Forest in small numbers and I believe that in future it will be able to maintain itself in these places in populations of modest size.

An interesting historical note is that Stubbs, in 1920, found the Adder very rare in the Forest. He commented: "I think their entire extinction is but a few years distant". His prediction almost came true 60 years later.

THE FUTURE

The one serious threat to the survival of reptiles in the Forest is, as already mentioned many times, the tendency of the old plains and open spaces to disappear to invading woodland. However, the Conservators have restored some plains, such as Copley and the Furzeground, have resurrected pollarding as a management policy, and have granted permission to voluntary groups such as the Epping Forest Conservation Volunteers and British Herpetological Society members to undertake various restoration tasks. The Forest Centenary Trust organises work parties of schoolchildren to clear scrub and clean ponds. These factors, and the interest in the Forest's wildlife stimulated by the Epping Forest Conservation Centre, have resulted in much progress, in terms of practical conservation work, in recent years. If this continues, the Forest will improve tremendously as a habitat for wildlife.

Tasks which I feel would be of particular benefit would be the recreation of Broadstrood and Wake Valley as open, marshy plains, as they were such rich habitats in the past.

Ponds, by natural process, become sedimented and infilled, and need occasional cleaning. The smaller ponds in Knighton Wood/Lords Bushes, now badly sedimented and overshadowed, are examples. David Scott records Crested Newts in fair numbers in the ponds in Lords Bushes in 1953-59. Baldwins Hill Pond will need cleaning regularly, a difficult task but it would be tragic if it were lost. Lower Goldings Hill Pond was also a very good site years ago, now badly in need of cleaning and the extensive removal of surrounding secondary woodland.

Direct human interference is not at present a problem, and is unlikely to become one. All of the Forest wildlife is protected by law, and the Forest is patrolled by Keepers. I am not aware of any collecting of reptiles. Amphibians are often taken by children, especially frogs and toads, but I doubt if it does any real harm in most places, and it is a good thing that children maintain a contact with nature.

The populations of reptiles are low; the collection of even a few specimens may be critical: in places the total population of a species may be no more than about 6. I therefore appeal to people to respect the Forest laws.

APPEAL FOR HELP

With the permission of the Superintendent of the Forest, Graham Walters and the author have been organising small work parties through the winter months to thin scrub on Deer Shelter Plain and at Birch Wood. We now have a small, keen group, but the task is massive and long. There is several years work to be done on each site. We are limited by lack of hands and tools. If you would like to take part, write to the author, or telephone Graham Walters on 01-521 0134. The work helps not only reptiles and amphibians, but creates good habitat for birds, mammals, insects and plants. We work on Sundays.

ACKNOWLEDGEMENTS

George Malenoir and John Davidson formed a small active group of Essex Field Club members which did regular field work in Epping Forest and other parts of Essex from 1958 to 1968. They did much to stimulate the interest of youngsters in reptiles and amphibians. For this, and as friends and colleagues — and to other members of the group, Roger Thorpe and Simon Townson — thanks are due. Graham Walters and Paul Moxey were very co-operative in helping organise the first of our clearance tasks a few years ago. Thanks are due to the Forest Superintendent for granting us permission. Appreciation should also be expressed for the efforts of those, not necessarily herpetologists, who have helped in our conservation work: Tim Green, Colin Braithwaite, Dawn Belshish, Martin Johnson, Chris and Carol Picton, Simon Townson, and others. Simon Townson has been a regular companion on excursions in the Forest for the past twenty years.



Come and join us!

Members of the British Herpetological Society at work clearing oak and thorn scrub
at Birch Wood, Epping Forest

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PICKETT'S PIECE

An irregular column of personal observations, notes, commentary, on all things herpetological.

Salamanders in paradise

Somewhere in the Apennines of Italy is a magnificent antique forest of Silver Fir, catching the moist air of the Mediterranean sea, the branches of the trees trail hairy strands of lichen. The floor of the forest is rich with carpets of flowers and ferns. There are numerous small trickling streams. In the cool and comfortable air of spring, the mossy ground and streamsides are dappled with the bright yellows of a great population of Fire Salamanders, here so numerous as to always be in sight of the human observer at whatever point in the forest he may be.

The race of salamander found here is the Apennine Fire Salamander, *Salamandra salamandra gigliolii* probably the most beautiful of the several geographic forms of this salamander. In its most distinct or strongly differentiated phase in the south of the Italian peninsular, yellow spots, blotches or stripes coalesce and extend themselves to cover almost the entire animal; completely yellow specimens are not rare. Reddish spots frequently edge or speckle the yellow. It is moderate in size, larger than *Salamandra s. terrestris*, but slightly smaller than *Salamandra s. salamandra*. It has been described as a slender form, but the specimens I have seen have been quite robust, more so than *terrestris*. Its pattern varies greatly. Though in all cases the yellow dorsal colour exceeds the black in extent, the yellow may be in the form of large irregular blotches, a solid yellow band from head to tail with black flanks, or boldly striped like *fastuosa* or *terrestris*. I have not seen such wide variation within populations of other species of the Fire Salamander. There are other differences. The larvae, though I did not measure them, seem smaller than in other types, and more numerous: four females collected one Autumn by some Italian friends of mine, gave birth in total to approximately 200 larvae during the course of the winter. If this is normal, the brood sizes of this salamander may be unusually large. A surprising behavioural characteristic of this salamander is that it is as much diurnal as nocturnal; very large numbers can be seen in broad daylight. This is in contrast again to other races. Some may also be diurnal — I would welcome other observations on this — but those I know of are more strictly nocturnal.

On some mountains, conditions particularly favour the salamander. Where forest cover is continuous, rainfall generous, and gently flowing tiny streams abound, affording safe nurseries for the young, the density of salamanders can be truly astonishing: they are undoubtedly in these places the most abundant vertebrate. At one time, before agricultural settlement, they must have been one of the most abundant of animals in Europe. Today, they are confined to the remnants of pristine mountain forest which remain. Or almost: its adaptability is such that it can surprise us: it can be found sometimes in the dry treeless Karst of Dalmatia, in open semi-arid country in Israel, and sub-alpine pastures in the Pyrenees and Cantabrians.

Back to the old forest in the Apennines. It is the habit of the salamanders of all ages to lay at the water's edge, sitting on stones or logs along the shady streams or lying partly immersed in the water; they are dotted along the banks like so many bright yellow flowers. Elsewhere they plod

slowly across the leaves of the forest floor as they must have done for thousands of years. It is an enchanting sight and an enchanted place. It is my (probably futile) hope that the trees are spared the axe, and this Paradise of Salamanders survives unchanged into the future.

Lizards and Man in the Canary Islands

The Grand Canary Lizard, *Gallotia simonyi stehlini*, is abundant on Gran Canaria. It is a versatile, tough, adaptable animal, found in all situations. Like its relatives on other islands, it is omnivorous in feeding habits. In a general sense, it is like a lizard version of a rat.

The settlement of the islands has been double edged for the reptiles. Some giant forms, like *Gallotia goliath*, a lizard of up to 1.5m in length, were almost certainly exterminated by man. It is possible that the giant tortoises known from fossil remains met the same fate. In modern times, the Lizard of Salmor was exterminated by collectors, chiefly for scientific institutions. However, most of the remaining species have benefited from the human presence. The introduction of the Prickly Pear cactus (*Opuntia*) has provided a new year-round food source for *Gallotia*: despite the protective spines, they eat the fruit. Lizards can be seen with jaws red from the juice. This has enabled the lizards to increase their number. The cultivation of bananas and tomatoes has also enabled the lizards to build up dense populations, coupled with the protective cover afforded by stone walls.

The lizards are regarded by farmers as a pest, as they damage the tomato crop, and often trap and poison them. The Spanish herpetologist, Luis Felipe Lopez-Jurado of Las Palmas, estimates that between five and ten thousand *G. simonyi stehlini* are poisoned annually by tomato growers on Gran Canaria. Despite this mortality, the lizards are not threatened. On balance, they are still benefited by human settlement and are able to maintain much higher populations in cultivated districts than under more natural conditions. This phenomenon can be observed in other places, and is not sufficiently taken into account by herpetologists. We generally assume the human influence to be a wholly negative one for wild fauna, but this is by no means always the case.

BOOK REVIEWS

THE MAN WHO WAS M. THE LIFE OF MAXWELL KNIGHT

By Anthony Masters

Basil Blackwell Publisher. 1984. ISBN 0-631-13392-5.

To any herpetologist who was alive in the 1950's or 60's the name of Maxwell Knight needs no introduction. A founder member of the BHS, Maxwell Knight was a well known broadcaster and writer, with a special penchant for reptiles and amphibians. Many of today's leading naturalists owe much to his influence and the sound and practical advice which he so skilfully conveyed in his books and on radio.

This book provides information on another side of Maxwell Knight's life and character. Anthony Masters reveals that Knight played a vital role in MI5 in the Second World War. With the help of young case officers, he was responsible for counter-subversion and was able to expose a number of important spies and (*inter alia*) uncover a Nazi plot to prevent the entry of the USA into the War.

This all makes fascinating and exciting reading. Coupled with an analysis of Maxwell Knight's contribution to natural history it could so easily have resulted in a scholarly critique of a man who lived two separate, but equally influential, lives. Unfortunately, however, Masters chose to follow the current trend of trying to discover or reveal aspects of a person's behaviour and psychology that might undermine his popular reputation by showing that, in fact, he had feet of clay. The reader does not need to be reminded that Maxwell Knight, like all of us, exhibited foibles and human weaknesses. But the "evidence" that he had homosexual tendencies is very weak and many of the allegations about his attitude and behaviour towards his wife are just not borne out by those who knew them both.

Doubt over the extent to which Masters carried out his research — or interpreted the findings — on Maxwell Knight as a person is confirmed by reading the (short) sections about the latter's contributions to natural history. There are several elementary mistakes: for example, Knight is referred to as "Uncle Max on Nature Parliament" but any listener or student of that period would know that the correct title of "Uncle Mac" was the one originally used by Derek McCullough on radio programmes during the Second World War and subsequently. No real attempt has been made to analyse Maxwell Knight's contribution to natural history. This is a pity because he played a significant part in a number of fields. Herpetology was his particular love and he produced a number of scientific papers on this subject as well as adding to national and local records and, through his books and broadcasts, encouraging an appreciation of reptiles and amphibians amongst the British public. But he was also an excellent general naturalist and made contributions to our knowledge of subjects ranging from the entomology of bird pellets to the behaviour of dormice. None of this comes out in Master's book and as a result it is of only very limited value to biologists and natural historians.

This book is of interest to those who wish to read more about MI5 in the War and to learn of the important part played by Maxwell Knight and his team in thwarting enemy agents and sympathisers. It cannot, however, be recommended to those who are anxious to learn more about Maxwell Knight the biologist. To most naturalists he will be remembered as one of a small group of enthusiasts who through their writings and broadcasting brought natural history to public attention in the 1950's. To those, like the reviewer, who knew him personally he was a kind and generous person who, despite the pressures of a busy life spared time to give advice and encouragement to others. Herpetologists would find a fully critical analysis of Maxwell Knight's work of great interest and value: regrettably this book does not provide it.

J.E. COOPER

GUIA DE CAMPO DE LOS ANFIBIOS Y REPTILES DE LA PENINSULA IBERICA, ISLAS BALEARES Y CANARIAS

By Alfredo Salvador.

Published by Alfredo Salvador, Apartado num F.D., 24080 Leon, Spain. Price 2,500 pesetas.
(FIELD GUIDE TO THE AMPHIBIANS AND REPTILES OF THE IBERIAN PENINSULA, BALEARIC ISLANDS AND CANARY ISLANDS)

This is an excellent new guide to the reptiles and amphibians of Spain. It is well printed and bound. There are beautiful colour plates (photographs) of every Spanish species. There is a complete series of detailed distribution maps, based on spots reflecting actual records: in my opinion the best and most informative way of showing distribution, even though there are some deficiencies in this. For example, *Tarentola boettgeri* in Gran Canaria has only two spots, and *Gallotia simonyi stehlini* on the same island is represented by only eight spots, yet both species, as is well known, are abundant on most parts of the island. The book has a very long, complete, thorough and up to date bibliography, which is extremely valuable in itself. In addition to the systematic bibliography, each individual species account has a list of references of its own, which can be checked against the main bibliography. This is an unusual and highly valuable feature.

The text is detailed and informative. It is divided into keys and species accounts.

The keys are clear, thorough and illustrated by drawings of exceptional quality, accuracy and detail. An impressive example is the key to the tadpoles of frogs and toads: there are separate large drawings for each species of both mouth parts and the complete animal, both finely detailed and the best possible for purposes of recognition. The scalation of the reptiles is also splendidly portrayed. These illustrated keys are unsurpassed in any field guide I have seen.

The species accounts are of the same high standard, with physical descriptions, details of geographical variations, ecology, reproduction and distribution. These are more detailed and informative than one would expect from a field guide. The sections on ecology are particularly good, with very interesting information on habitats, diet, activity cycles, including how these vary from place to place, and in the species' whole range, not just in Spain. An example of the detailed nature of the species accounts is that of the Balearic Island lizards, *Podarcis lilfordi* and

P. pityusensis. Each of the numerous variable small island populations is described individually, in body form and colour, and each of the islands is shown in the distribution maps.

This book sets a new standard in field guides. It is the best I have seen. More than a basic guide, it is a first rate general account of the Spanish reptiles and amphibians. Alfredo Salvador is to be congratulated.

JOHN PICKETT

AMPHIBIANS OF EUROPE, A COLOUR FIELD GUIDE

By Donato Ballasina

Published by David and Charles, Newton Abbot, Devon. price £7.95.

This is basically a pictorial guide to the amphibians of Europe. Its best feature is the series of superb colour plates of every species, most of which I have not seen published elsewhere. The book is worth buying for these.

Some features of the animals' body form, reproduction, habitat, activity, distribution and conservation status are expressed through symbols in a 'pictogram', instead of prose, which is restricted to a few lines to explain some points which cannot be readily included in the pictograms. Some people may find this method of description effective, but personally I think it is inadequate and confusing, and much prefer prose. I would also make a critical remark about the distribution maps: these are shaded with yellow, which is not as easy to follow visually as a darker colour would be, especially when small areas or islands are depicted. The British ranges of *Bufo calamita*, *Rana ridibunda*, and *Rana esculenta/lessonae* are missing from the maps entirely.

Apart from the species accounts there are sections on the basic biology of amphibians, conservation (extensive), legislation, useful advice on photography, and an up to date list of addresses of European herpetological societies. There is a special emphasis on conservation and protection.

The book is compact and well designed and produced.

JOHN PICKETT

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The attention of members is drawn to the various Acts of Parliament and EEC regulations governing the import, possession and sale of reptiles and amphibians. Advertisements are accepted on the understanding that animals are legally obtained and offered for sale.

- * **Wanted:** regular supply of earthworms (*not brandlings*) to feed vast collection of animals! Good prices paid.
Please contact P.J. Wisiewski, Amphibian Breeding Centre, 38 Hesketh Road, Burscough, Lancs.
Tel: 0704 894503 (evenings).
- * **Wanted:** Green Toads (*Bufo viridis*), or spawn/tadpoles.
Phil Merrin 0376 25602.
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Articles, new items, notes and letters on any aspect of herpetology are needed for the Bulletin. Contributions should, if possible, be typed. Handwritten items should be clear and legible. All contributions should be double spaced and on one side of the paper only. They should be sufficiently presentable to be given directly to the printer. Contributors are urged wherever possible to follow the "Instructions to Authors" printed on the inside back cover of the British Journal of Herpetology. Titles, headings and sub-headings should be in block capital letters, but not underlined. Only latin names should be underlined. The name and address of the author should immediately follow the main heading, except in letters. Photographs can be reproduced only from good quality black and white prints. Reprints of articles can be supplied to authors. These must be requested from the Editors before the Bulletin goes to press.

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