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THE BRITISH HERPETOLOGICAL SOCIETY

BULLETIN

No. 15 March 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:
John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW

REMAINING MEETINGS 1986

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

MARCH 18th	A.G.M. (see separate Agenda), followed by Dr. M.R.K. Lambert (Chairman, BHS): Some more herpetofauna of the Commonwealth. II. Ethiopian Zone (as time allows).
APRIL 24th	Dr. Paul Verrell (Dept. Biology, Open University, Milton Keynes): Sexual cycles and breeding dynamics of smooth newts in southern England.
MAY 28th	*Conservation of rare herpetofauna and their habitats:* work of the Conservation Committee. *Speakers:* G.A.D. Haslewood (Chairman); T.J.C. Beebee (amphibians); J. Webster (reptiles); K. Corbett (Conservation Officer's work).
JUNE 19th	**Amphibia and reptiles Worldwide: their care and breeding.* A discussion organized by the Captive Breeding Committee (Chairman: Simon Townson).
JULY	Meeting and date to be arranged (see announcement in *Bulletin).*
SEPTEMBER 23rd	Topic to be arranged by Captive Breeding Committee.
OCTOBER 23rd	*Conservation and Ecology of Mediterranean Tortoises.* Dr. Ian Swingland (School of Continuing Education, Univ. Kent, Canterbury, and Chairman, IUCN/SSC Tortoise Group) and David Stubbs (Founder, Station d'Observation et de Protection des Tes Maures, France): 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.
NOVEMBER 18th	John Buckley (Member, BHS Conservation Committee): Natterjack conservation, including reintroductions, in East Anglia.

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

CORRECTION TO BULLETIN 13

The third paragraph on Page 22, Bulletin 13 (D. Billings, The Care and Breeding of the Common British Reptiles and Amphibians — Part IV, The Palmate Newt, *Triturus helveticus*) should have read:—

> "Meanwhile, the eggs, having been removed from the original tank to prevent the adults eating them, were developing well and began to hatch approximately four weeks after being laid. The newly hatched tadpoles were really minute, no more than 8mm long. I started by feeding them on infusoria, graduating to cyclops, daphnia and bloodworms as they grew larger."

THE EDWARD ELKAN REFERENCE COLLECTION OF LOWER VERTEBRATE PATHOLOGY
A PROGRESS REPORT

Dr. Edward Elkan, who was recognised internationally for his work on the pathology and diseases of reptiles and amphibians, died in July 1983, at the age of 88.

Following Dr. Elkan's death a Memorial Fund was established in order to perpetuate his name and work and to preserve and maintain his unique collection of pathological specimens and other material. The latter is housed at the Royal College of Surgeons of England, London. Thanks mainly to the hard work of John and Wendy Thorpe-Dixon and with the assistance of others, a preliminary catalogue has now been drawn up and this shows the Collection to consist primarily of:—

a) microscope slides — large numbers of histological sections of reptiles, amphibians, fish, invertebrates and mammals.

b) 35mm transparencies — many of them of pathological material but others depicting normal biology

c) books — an excellent library of zoological and herpetological texts, some of which are now out-of-print but remain reference texts

d) mounted pathological specimens

e) assorted reprints, papers, line drawings and notes

While some of the items above have already been sorted and listed much remains to be done and assistance with this task would be much appreciated. The microscope slides, in particular, warrant careful examination preferably by someone with knowledge and experience of histology or pathology.

The preliminary catalogue will be available shortly. Copies will be sent to each of the major herpetological societies but anyone wishing to have his or her own is welcome to write for one.

In due course it is hoped to add new material, especially books and papers but also pathological specimens, to the existing Collection. This should help to ensure that the Edward Elkan Collection not only remains viable but also expands and evolves.

Contributions to the Fund continue to be welcomed. Cheques should be made payable to "The Edward Elkan Memorial Fund" and forwarded to the address below.

This is only a progress report and further information will be published in due course. It is our hope and intention that the "Edward Elkan Reference Collection of Lower Vertebrate Pathology" should be widely used for study by herpetologists, pathologists and research workers from a range of disciplines.

J.E. Cooper
Royal College of Surgeons of England
35-43 Lincoln's Inn Fields
London WC2A 3PN

REPORT ON THE HERPETOLOGY IN WALES MEETING, NOVEMBER 1985

On 30th November 1985 over 40 people participated in the first (at least in recent years) 'Herpetology in Wales' meeting, at Llysdinam Field Centre, Powys. The programme consisted of seven short talks by different speakers plus a demonstration of local amphibians and reptiles. After Dr. Fred Slater, Curator of the Field Centre, had formally welcomed participants, Dr. Richard Griffiths explained that the meeting had been called for two reasons: (1) to enable all those with an interest in herpetology in Wales to get together and discuss the range of herpetological activities that are going on in and around the principality, and (2) to give all those who wanted to find out more about herpetology the opportunity to do so.

The first talk was by Lionel Kelleway, formerly a researcher at University College, Swansea, and now a BBC broadcaster on natural history topics. In a highly entertaining presentation, Lionel discussed the general ecology of snakes and lizards in Wales and highlighted the need to fill the gaps in the distribution maps for these species in the principality. Richard Griffiths then spoke on survey techniques for amphibians, emphasizing the importance of getting the time of year and time of day right for the different species, and how with simple equipment, valuable field surveys can be carried out. This was appropriately followed by Martin Noble (a BHS member and wildlife manager for the Forestry Commission) who talked on how to go about surveying for reptiles. Martin also discussed habitat management and captive breeding projects for conservation. After lunch, Simon Mickleburgh (FFPS) spoke on the ecology and distribution of crested newts in mid-Wales, followed by Pat Wisniewski on establishing breeding colonies of amphibians in captivity. Pat, who runs his own amphibian breeding centre, has a collection of some 200 amphibians and has managed to obtain a 100% success rate in raising tadpoles to metamorphosis in some species, a remarkable achievement. Dr. John Davenport, of the University College of North Wales, then discussed his turtle research programme at the Marine Station at Menai Bridge. On his recent trip to Malaysia, John investigated how estuarine turtles manage to cope with the salinity changes which occur in estuaries. Dr. Elizabeth Pulford, also of U.C.N.W., concluded the series of formal talks with a discussion of the habitat destruction problems facing tortoises in Alyki, Greece, illustrated by some fairly horrific slides of tortoises maimed by road vehicles and fire.

Records and recordings featured prominently in the general discussion which followed. Wales is a very under-recorded area as far as reptiles and amphibians are concerned and all naturalists are encouraged to make records of even the common species in their areas. Some participants showed an interest in learning more about field techniques.

In order to obtain some idea of the interests of those attending the meeting, participants were asked to complete a questionnaire. The results of this exercise are summarized below in the hope that they may enable other potential organizers in the planning of regional meetings, and to give some idea of the interest in herpetology at the 'grass roots' level.

The distance which people had travelled to reach the meeting varied from 1 mile to 200 miles, with an average distance of 64 miles. Potential participants therefore appear to be willing to travel surprisingly long distances to attend herpetological events (even in treacherous weather conditions!). Some 37% of those attending were members of a herpetological society, whilst 70% belonged to a local Nature Trust or other natural history organisation. When asked what particular aspects of herpetology interested them, 37% replied keeping/breeding reptiles and amphibians in captivity, and 77%

field studies of native species. Some 80% were interested in conservation, and 63% wanted to find out more about herpetology in general. 27% had an interest in work on foreign species. When asked if they would be willing to attend such meetings on a regular basis all of those who replied said 'Yes', with about half preferring an annual meeting and half a biannual meeting.

To a large extent, the results of this survey probably reflect (1) the much larger membership of general natural history organisations compared with the more 'specialised' societies such as the BHS, and (2) the appeal of the talks on offer. However, it does seem that the general naturalist is not necessarily preoccupied with buttercups, birds and butterflies, and that there exists a basic underlying interest in herpetology waiting to be tapped. Perhaps the BHS should attempt to make itself more accessible to such people by publicizing herpetology through the larger, more general natural history organisations (as is currently being done through the FFPS, for example). In order to attract as wide an audience as possible it therefore seems a good idea to try and keep future regional herpetological meetings as broad as possible. Are there any offers to organize 'Herpetology in Wales '86'?

Richard Griffiths
Department of Applied Biology
UWIST, Llysdinam Field Centre
Newbridge-on-Wye, Powys

MEMBERS' ADVERTISEMENTS

* **Wanted:** Marbled Newts (*Triturus marmoratus*), Caucasian Banded Newts (*T. vittatus ophryticus*), Green Toads (*Bufo viridis*), Midwife Toads (*Alytes obstetricans*), European Fire-Bellied Toads (*Bombina bombina*).
S.R. Hartley, 'Hillside', Milford Lane, Tamerton Foliot, Plymouth, Devon PL5 4LU.
Tel: Plymouth 707094.

* **Wanted:** European Fire-Bellied Toads (*Bombina bomina*) and Marbled Newts (*Triturus marmoratus*).
John Dowling, 164 Rudston Road, Childwall, Liverpool L16 4PJ. Tel: 051 722 1555.

* **Free:** *Triturus alpestris*, Metamorphosed July 1985. A small number available to members willing to collect.
D.J. Palmer, 7 Woottens Close, Comberton, Cambridge CB3 7DA. Tel: 9826 3845.

* **For Sale:** Adult pair of common garter snakes and four captive bred two year olds.
Simon Culpin, 10 Summerhouse Road, Godalming, Surrey GU7 1PY. Tel: Godalming 6845.

* **Wanted:** Striped Fire Salamanders, *Salamadra s. terrestris* or *S.s. fastuosa.*
John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW. Tel: 01-508 6624.

* **Information Wanted:** Dr. Franco Andreone of Turin is undertaking a thorough study of *Pelobates fuscus* in collaboration with Dr. Kurt Grossenbacher of Bern, and the University of Pavia. They require living specimens of *Pelobates fuscus fuscus.* Anyone able to help should contact Dr. Franco Andreone, via Molino 10/1, 10040 Caselette, Torino, Italy.

RECENT PUBLICATIONS

Proceedings of the Northern California Herpetological Society and the Bay Area Amphibian and Reptile Society Conference on Captive Propagation and Husbandry of Reptiles and Amphibians (1985). Price $18.00 post paid.

Proceedings of the NCHS Conference on Captive Propagation of Reptiles and and Amphibians (1983). Price $13.00 post paid.

Annotated Outline of Captive Care of Snakes and Lizards by Dr. Pat Morris. Price $5.00 post paid.

All three titles available from: Northern California Herpetological Society, 706 Arnold Street, Davis, California 95615.

RIVERBED HIBERNATION IN THE COMMON TOAD, *BUFO BUFO*

CHRIS LISCOE

Rose-Lea Cottage, Main Road, Kilsby, Rugby, Warwickshire CV23 8XR

Whilst scuba diving at midday in the rivers of Dochart and Forth in Scotland, single common toads respectively 10 and 8cm long were found apparently hibernating on the river bottom. In both cases the toads were half buried, head down, in the mud. After examination at the river surface the toads were replaced at the site they were found. Details of the depths of the toads and the river conditions are as follows:—

	River Dochart Near Luib, Stirlingshire	River Forth Near Kippan, Stirlingshire
Date	12th March 1985	17th March 1985
Water temp. (°C)3.5	3.0	
Visibility (m)	4.0	2.0
Current (k/h)	0.5	0.5
Depth of river (m)	8.0	3.0
Depth of toad (m)	8.0	2.0
Riverbed state	Fine clay with large scattered eroded lumps of clay	Fine clay, eroded gullies, human refuse

UNUSUAL TAIL REGENERATION IN A SAND LIZARD — *LACERTA AGILIS*

MARCUS LANGFORD

30 Redhoave Road, Canford Heath, Poole, Dorset BH17 9DV

On the 22nd September 1985 I caught, under N.C.C. licence, an adult female sand lizard basking on dead gorse on a site near my home on Canford Heath, Dorset. Her snout-vent measurement was 6.8cm and her tail measured 6.7cm of which 4.1cm was regenerated.

On closer examination I found that a second, smaller, tail was present approximately 2.2cm down the regenerated portion of tail. This smaller tail pointed vertically downwards and must have caused a certain amount of hindrance to the lizard when moving through the vegetation.

The presence of this offshoot suggests that later damage must have occurred to the tail in the regenerated portion.

REPEATED SPAWNINGS IN *HYPEROLIUS MARMORATUS*

CHRISTOPHER MATTISON

138 Dalewood Road, Beauchief, Sheffield, 8

Hyperolius marmoratus is a polymorphic reed frog from southern Africa. Adults are usually coloured brown and cream, the colours being arranged either as brown mottling on cream, or as brown stripes on cream (i.e. 'humbug-style') but occasional males apparently retain the plain brown juvenile markings into maturity. In an attempt to investigate the genetics and significance of these variations, a small group of adults was obtained from Mtuzini in Natal. Unfortunately, the work was never completed but the reproductive data obtained may be of some interest.

12 adults from the same locality had the following markings:

males — 6 striped; 1 brown
females — 3 striped; 2 mottled

All possible combinations of these markings were paired, but the brown male never attempted to breed and was not heard to call — this may or may not be significant.

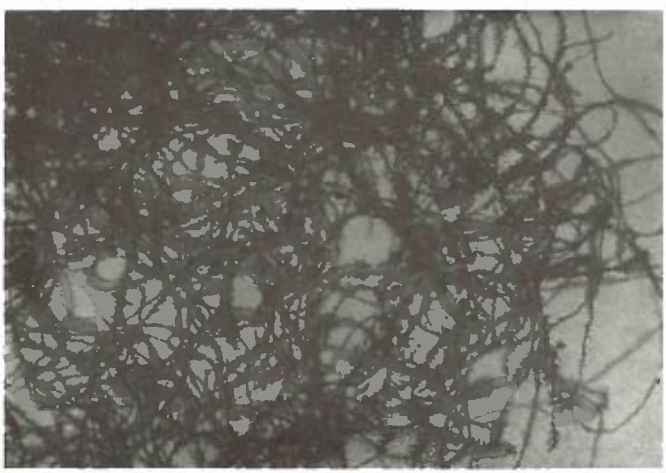


Plate 1. Eggs of *Hyperolius marmoratus* on Java Moss.

The animals were originally housed in large plastic lunch boxes containing a pad of damp filter paper and a small petri-dish of water. This method was used successfully by Richards (1977) to breed *H. viridiflavus,* the only previous report of captive breeding in *Hyperolius.* However, both productive pairs laid infertile clutches on the bottoms of these boxes and were subsequently moved to larger cages. These consisted of glass aquaria measuring 18 x 10 x 10 inches, containing about 2.5 inches of water. A thin styrofoam platform was wedged across the tank at surface level to give a dry area (for the introduction of food) without affecting the volume of water. A small clump of Java moss (*Vesicularia dubyana*) was placed in the water and this was changed each time that spawning occurred. The adults were fed daily on crickets and houseflies dusted with 'Vionate', a powdered vitamin-mineral supplement.

Temperature was kept at a constant 72 degrees F and the photoperiod was 14 hours light: 10 hours dark. As the room received no natural lighting only a single flourescent lamp, a covered desk lamp was left on permanently in order to avoid total darkness at night.

Males (whether paired or not) began calling soon after 'lights-out' each night, usually while clinging to the glass sides of the aquarium. The call was a high-pitched 'peep-peep-peep', best likened to a squeaky wheelbarrow being moved about. Spawning was never observed and invariably occurred during the night, the spawn being deposited in several small clumps, attached to the Java moss, each containing about 20 eggs.

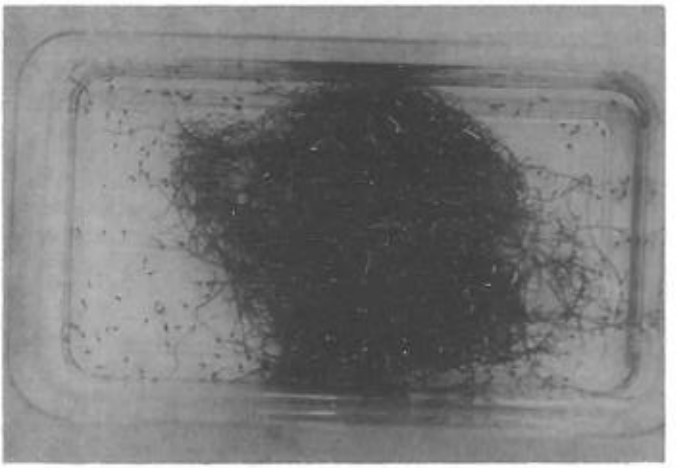


Plate 2. Young larvae of *Hyperolius marmoratus* in rearing container.

Spawn and tadpoles were raised in small plastic boxes containing 'their' Java moss; aeration was provided via a hypodermic needle attached to a plastic air line. The tadpoles were fed on a good quality tropical fish flake and were kept clean by periodically changing about 30 per cent of their water. Local tapwater (Ph 6.6) was used throughout. At metamorphosis they were transferred to an 18" x 10" x 10" aquarium lined with moist tissue and fed on small crickets. Although they grew rapidly, it was necessary to dispose of the colony before any reached reproductive size. All juvenile *Hyperolius marmoratus* are brown in colouration.

HYPEROLIUS MARMORATUS –BREEDING DATA

	Date laid	Date hatched	No.	Date first metamorphosed
Female 1	29.12.81	infertile*		
	16. 1.82	infertile*		
	26. 1.82	30. 1.82	200	7. 4.82 (66 days)
	5. 2.82	9. 2.82	241	Died
Female 2	4. 1.85	infertile*		
	22. 1.82	26. 1.82	333	31. 3.82 (64 days)
	1. 2.82	6. 2.82	230	12. 4.82 (65 days)
	13. 2.82	17. 2.82	190	24. 4.82 (66 days)
	28. 2.82	3. 3.82	186	10. 5.82 (61 days)
	11. 3.82	15. 3.82	179	26. 5.82 (62 days)
	22. 3.82	26. 3.82	—	
	6. 4.82	10. 4.82	—	
	16. 4.82	infertile**		
	26. 4.82	infertile**		
averages	11.2 days	inter-clutch	223	64 days

* clutches of eggs laid in plastic boxes

** male died shortly after the last of these two infertile clutches

DISCUSSION

Hyperolius marmoratus breeds readily and prolifically under simple conditions (although I have since been unable to induce commercially obtained specimens to reproduce or even to stay alive for any great length of time). Their enormous breeding potential and polymorphism could be of value to geneticists and behavioural ecologists (as well as to persons requiring large numbers of small frogs as snake-food etc.). It would be of great interest to see if this reproductive potential occurs in the wild as well as under controlled conditions — if so, this, and other similar species undoubtedly contribute a significant biomass to the lower and middle trophic levels of the eco-system.

ACKNOWLEDGEMENTS

The animals were collected for me in South Africa by Arthur Stevenson of the University of Wales, Cardiff.

REFERENCES

Richards, C.M. (1977). Reproductive potential under controlled conditions of *Hyperolius viridiflavus,* a Kenyan reed frog.

Journal of Herpetology **11** (4): 426-428.

NEW REPTILE BREEDING CENTRE IN THE CANARY ISLANDS

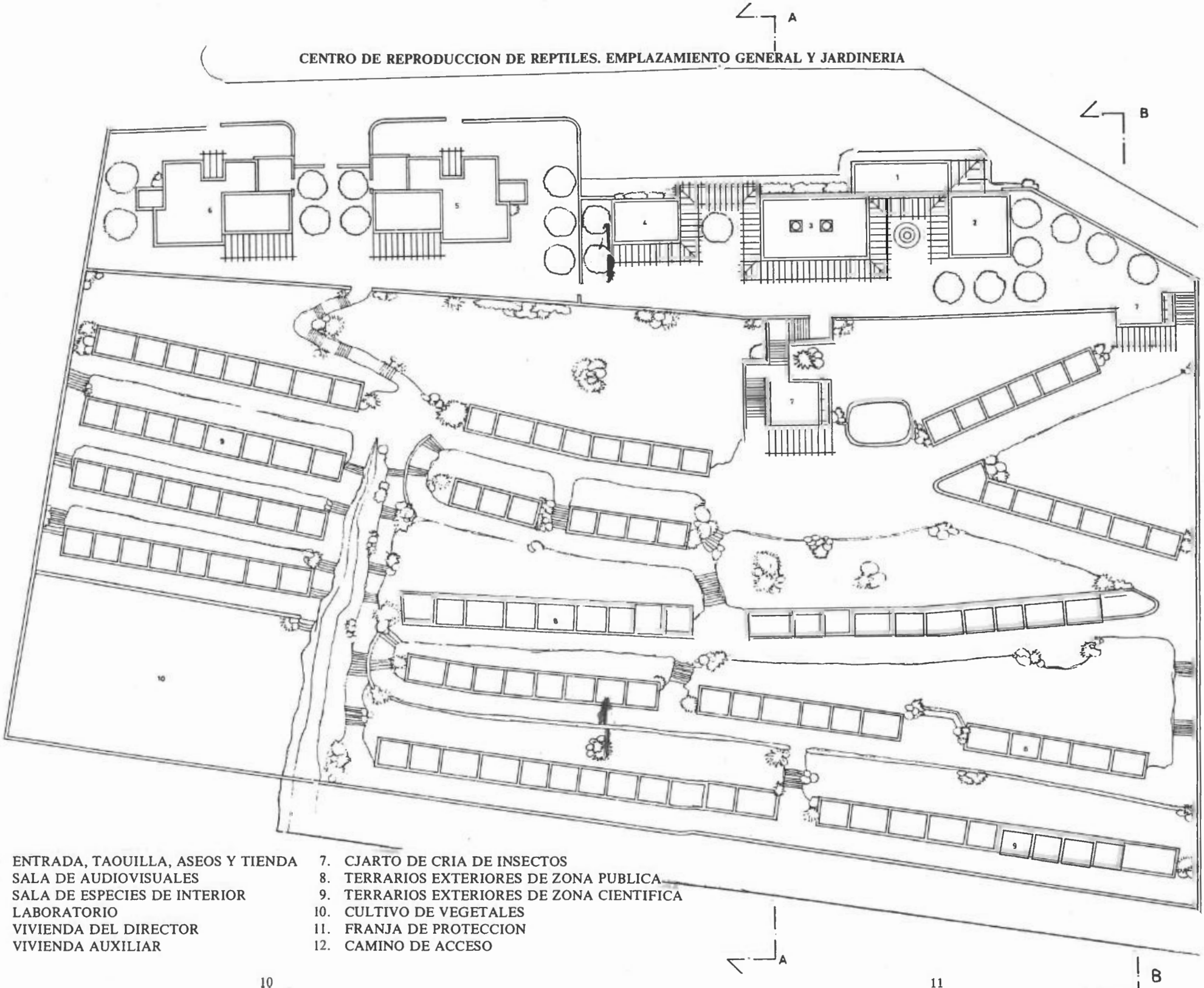
Mr. Bert Langerwerf, the well known Dutch breeder of lizards, has moved to Grand Canary, Spain, to establish the "Centro de Reproduccion de Reptiles". The Centre will include extensive outdoor enclosures, covered areas for tropical species, a laboratory and accommodation for visiting herpetologists, and a lecture theatre and library. The Centre will have a wide scope, breeding a great variety of reptiles and amphibians from all over the world. The Centre has been financed privately by Mr. Langerwerf and his Spanish and English colleagues, Luis Felipe Lopez Jurado and James Pether. It will be completely independent and financially self-sustaining, mainly from income from tourists. Surplus animals bred at the Centre will be supplied to foreign herpetologists and institutions. The emphasis of the Centre will be educational. All profits will be used to sponsor conservation projects around the world.

Because of the unique native fauna of the Canary Islands, great care is being taken to ensure that no alien species can escape from the Centre. The area will be enclosed by a secure outer wall.

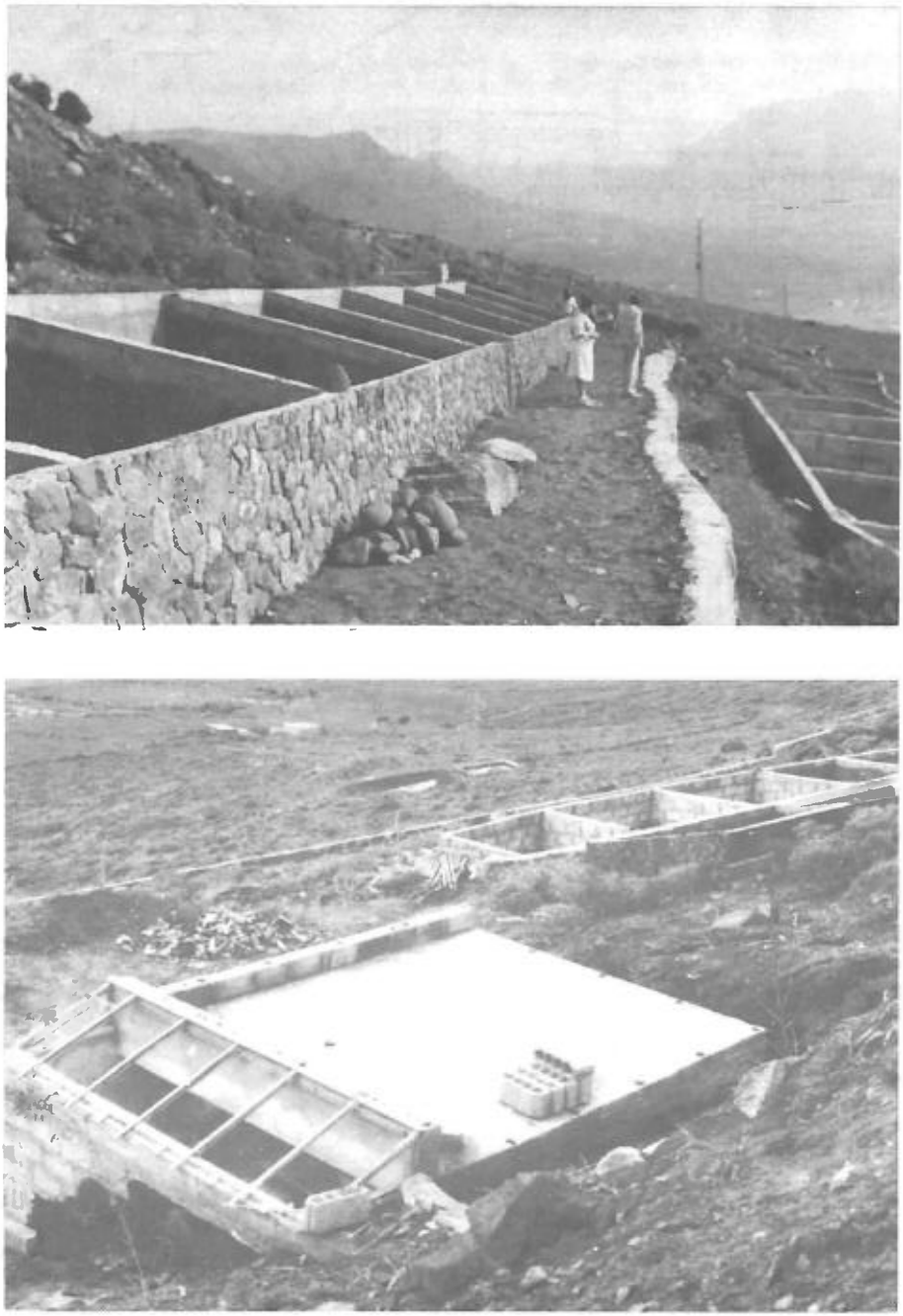
Construction work at the site, at Galdar, is well under way, and the first part of the Centre will be open to the public in the summer of 1986. Reports on the progress and work of the Centre will appear regularly in this Bulletin.

Mr Bert Langerwerf building enclosures at the
Centro de Reproduccion de Reptiles, Galdar, Gran Canaria.

CENTRO DE REPRODUCCION DE REPTILES. EMPLAZAMIENTO GENERAL Y JARDINERIA



1. ENTRADA, TAQUILLA, ASEOS Y TIENDA
2. SALA DE AUDIOVISUALES
3. SALA DE ESPECIES DE INTERIOR
4. LABORATORIO
5. VIVIENDA DEL DIRECTOR
6. VIVIENDA AUXILIAR
7. CJARTO DE CRIA DE INSECTOS
8. TERRARIOS EXTERIORES DE ZONA PUBLICA
9. TERRARIOS EXTERIORES DE ZONA CIENTIFICA
10. CULTIVO DE VEGETALES
11. FRANJA DE PROTECCION
12. CAMINO DE ACCESO



Enclosures and terraces under construction at the
Centro de Reproduccion de Reptiles, Galdar, Gran Canaria

REPTILES OF CENTRAL NEPAL

R.P.T. COX

Christ Church, Oxford, OX1 1DP

INTRODUCTION

The herpetofauna of Nepal comes from four zoogeographical subregions — the Indian, Indo Chinese, West Chinese and Mediterranean.

The dominant plains, lower foothills and Valley species are from the Indian subregion and generally do not extend into the mountains. The Indo Chinese are largely coexistant with these. From the Mediterranean subregion come species that extend in range down to Nepal from Kashmir and in some cases the Red Sea. These species on the whole have a wide altitudinal range. Representatives of the Chinese subregion are found mainly at higher altitudes.

BIOTOPES

The areas of Central Nepal I visited were the Royal Chitwan National Park, Tharu (a village outside the Park), the Kathmandu and Pokhara Valleys and the Langtang National Park.

The Royal National Chitwan Park is mainly comprised of sal forest, elephant grass and tropical deciduous rain forest. The latter two occur on the lower, wetter ground along the river courses. The temperature varied from 27/28°C on cloudy days to 30°, sometimes perhaps a little more, on sunny.

Where not cultivated the forest of the Kathmandu Valley and surrounding hills is predominantly of pine and oak species with some mixed temperate broad-leaved trees. At the height at which I found lizards in the Langtang Park, six to seven thousand feet, the slopes were grass covered with the odd juniper and rhododendron shrub or conifer.

LIST OF SPECIES

Sauria

Gekkonidae

Cosymbotus platyurus (Schneider)
Found living in and on buildings in the Kathmandu Valley (in Kathmandu, Patan and Godawari). Most abundant in Godawari.

Hemidactylus brooki (Gray)
The commonest gecko I found, occuring in the Chitwan Park, Tharu, Trisuli Bazaar, Pokhara and Kathmandu and often living in association with other geckoes in buildings.

Hemidactylus flaviridis (Rüppell)
Found in Pokhara in or on houses only. As with all geckoes I came across, except *H. garnoti,* it is nocturnal emerging at dusk from the eaves or roofs of buildings.

Hemidactylus frenatus (Schlegel)
Found in Tharu living in association with *H.brooki.* Both species abundant.

Hemidactylus garnoti (Duméril and Bibron)
A shy gecko only seen in buildings when empty. It is diurnal, most sightings occurring between 9 and 10 in the morning. Found in the Chitwan Park.

Agamidae

Agama tuberculata (Hardwicke and Gray)
Occurs in fairly large numbers in the Langtang Park at heights of six to seven thousand feet, living in rocks on grassy slopes.

Calotes versicolor (Daudin)
A diurnal, arborial lizard found in sal and riverine forest and elephant grass in Chitwan. Also common in gardens where it was found in Tharu, Kathmandu and Godawari.

Scincidae

Mabuya dissimilis (Hallowell)
Several individuals found in the garden of Tharu Lodge foraging through the leaf litter. Males had red flanks indicative of it being the breeding season (sightings were in early July).

Scincella sikkimensis (Blyth)
One individual seen on a patch of bare earth on a grass bank at Tharu.

Varanidae

Varanus bengalensis (Schneider)
One individual seen in Patan.

Serpentes

Colubridae

Lycodon aulicus (Linnaeus)
One individual seen moving down a wall of the lodge at Tharu. This is one of the most common snakes of the Indian plains and is often found living near human habitations, sometimes even in houses between the ceiling and roof.

Crocodilia

Crocodylidae

Crocodylus palustris (Lesson)
Found in the Chitwan Park along the water courses and in pools in the swampier parts of the elephant grass.

Gavialis gangeticus (Gmelin)
Two individuals seen on a mud bank of the Narayani River, Chitwan. As approached they slipped into the water.

DISCUSSION

Of the thirteen species listed queried identifications are *Hemidactylus garnoti* and *Scincella sikkimensis*. *H.garnoti* appeared in some aspects to be intermediate between *H.garnoti* and *H.karenorum*. The similarities with the latter were in having postmentals contacting infralabials and perhaps in stronger colouration, but their lack of enlarged tubercules placed them with *garnoti*. Both species are parthenogenic. *S.sikkimensis* was a tentative identification, the *Scincella* being a difficult group that is currently undergoing revision.

Though *Mabuya dissimilis* has been previously recorded from North India, Pakistan and Kashmir and Jammu this is the first firm record of them in Nepal. *Calotes versicolor* and *Hemidactylus brooki* were the most frequently observed species; the

Calotes can be found in most biotopes up to a height of approximately six thousand feet. *Gavialis gangeticus,* though rare in Nepal generally, is becoming common in the Chitwan Park due to a breeding programme being carried out there.

ACKNOWLEDGEMENTS

I would like to thank A.V.J. Edwards, J. Edwards and ITNC for their financial support; R. Potter and Dr. B. King of Stowe School; and Dr. Arnold and Dr. McCarthy of the British Museum (Natural History) for their help both with the writing of the project and with the identification of the lizards.

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LETTERS TO THE EDITORS

Dear Sirs,

Democracy and Council Elections

Every year I receive with my Bulletin a list of names, proposed ordinary members of Council, and we then have the farce of an election at the A.G.M. I say this is a farce because we are presented with no information on the views or interests of the candidates, or their motives for wanting to be Council members. Surely the result of this practice is that many members do not vote as they know nothing about the candidates. This is something which cannot be good for democracy or the Society.

Furthermore at the last A.G.M. new Council officers were appointed without any prior notification of the posts being vacant. In this case I have no reason to doubt that the new officers will do a good job, but their method of election was fundamentally unfair. No-one else had a chance to volunteer their services, while members who live outside commuting distance from London were not even consulted.

Could the Council of *our* Society please consider the proposition that in future all nominees for any council posts, other than the representatives of the sub-committees, should write a short account of their interests and motives for standing for Council, and that when posts are vacant there is a fair chance for any member of our Society to stand for them. Surely this is not too much to ask of a supposedly democratic organisation?

Brian Banks
1 Brownings Cottages, High Street
Blackboys, East Sussex

Dear Sirs,

No Toads in North Essex: An Appeal for Spawn to Establish New Colonies

In recent years I have investigated dozens of farm and private ponds in order to map local breeding sites for the great crested newt in mid/north Essex. In the course of my survey work I have only once encountered Common Frogs breeding in the wild. However, I have yet to see or hear of the existence of a Common Toad breeding site.

In order to form a more complete picture of this local demise of the species, I appealed to the public through our local newspaper as to whether any breeding waters are still known to exist, to which I received a nil response. On the plus side however, six individuals who shared my concern over the toads' disappearance did contact me. As a result of this we now intend to establish colonies in our garden ponds from spawn obtained elsewhere. If we are successful, we may then use spawn deposited in our garden pools to re-generate other larger and more public waters. As we have no known local supply of spawn and the Essex Naturalist Trust has refused assistance, I would like to appeal to other B.H.S. Members, particularly those in East Anglia and South East England, to contact me and donate some toad spawn. My telephone number is 0376 25602 (home) or 01-488 2333 (office).

Philip Merrin
30 Acorn Avenue, Braintree, Essex

BOOK REVIEW

A DIRECTORY OF CROCODILIAN FARMING OPERATIONS

by R.A. Luxmoore, J.G. Barzdo, S.R. Bond and D.A. Jones,
International Union for Conservation of Nature and Natural Resources, Wildlife Trade Monitoring Unit, IUCN Conservative Monitoring Centre, 219(c) Huntingdon Road, Cambridge CB3 0DL, England: 1985. Paperback. 204 pages. Price not given. Approximately £9.

This is a detailed compilation of information on all known crocodile farms, commercial, non-commercial and proposed. The book's own introduction summarises its scope well: it "attempts to list all commercial crocodilian farms giving details of their stock, production, breeding success and husbandry". It fulfils this task admirably. The work was undertaken "partially to assist in the enforcement of CITES controls by identifying captive breeding operations and so-called 'farms' which are not breeding crocodilians, and also to ascertain the extent of farming so that its effect on crocodilian conservation can be assessed".

Those resolutions of the Convention on International Trade in Endangered Species which govern trade in captive-bred and ranched animals are usefully reprinted in full

The bulk of the book consists of accounts of individual farms, country by country. These accounts give information under such headings as Date of Establishment, Species and Numbers, Production and Trade, Source of Animals, Breeding, Husbandry and, interestingly, Finances.

The Introduction, in English, French and Spanish, gives general information and comments on CITES controls on trade and their interpretation as they affect the farming and ranching of crocodiles, and discusses the financial side of these activities, and the effects on the conservation of the species.

Considering the controversial nature of the farming of reptiles, and the general antipathy shown towards it by conservation organisations, this book is remarkably objective and unbiased in its commentary. It is a credit to the authors and the IUCN. The unbiased, cautious, and generally constructive approach is an example to others. It is much more persuasive than the anti-trade propaganda which we have become familiar with in the last few years.

The objective nature of the study is especially notable in the discussion on the effects of crocodile farming and ranching on conservation. The arguments for and against farming are carefully put. They are much the same as those for and against Turtle farming, and with which readers of BHS publications may be familiar. Arguments for farming are that it will meet some of the demand for products and reduce the need for hunting, that by reducing the prices of skins and improving the quality and dependability of supply, the profitability and extent of hunting will be further reduced. Against, are the arguments that the availability of farmed products may stimulate demand and thereby increase pressure on wild populations, that it is difficult to prove that produce is from genuinely farmed animals, and that control of trade in illegal products is rendered more difficult by the introduction of legal, farmed products into the market.

In addition to these arguments, other aspects of the effect of trade on the conservation of crocodiles are discussed. The authors make some positive, though cautious remarks about ranching and how it may benefit wild populations, and the economy of rural communities. These comments deserve to be quoted:

"Crocodilians have in the past been persecuted as vermin, and their swampy habitat is frequently destroyed to make way for 'more positive' forms of land use. The demonstrable ability of crocodilians to generate income may help to promote the conservation of healthy wild populations. This is particularly so with ranching, where the whole operation depends on the maintenance of a wild breeding stock, but to a much lesser extent captive-breeding farms may encourage the conservation of wild stock for periodic cenetic enhancement. The maintenance of a wild population of crocodilians necessitates the preservation of their habitat, which benefits the other organisms in the same environment. The financial incentive of crocodilian exploitation therefore also reduces the economic pressure for wet land reclamation ...

... Crocodilian ranching techniques can be adapted to conditions of village technology suitable for integration in the culture and economy of rural communities. The ranching programmes in Papua New Guinea and Northern Australia have the declared objectives of providing employment for indigenous peoples. Alternative schemes for the generation of income frequently entail far greater technological input and social disruption ..."

They conclude:

"... Commercial captive breeding, as discussed earlier, does less to further conservation, and it should not be seen, as it often is, as an alternative to habitat conservation. Ranching, on the other hand, may be far more beneficial as it requires the maintenance of a healthy wild population and the habitat which supports it. In essence it is little different from a controlled harvest of larger animals for skins; in the USA and Papua New Guinea the two types of exploitation run side by side. Ranching has some advantages over a direct harvest as it may be easier to regulate, particularly if, as in Zimbabwe, the USA and Australia, the collection of eggs is carried out entirely by Government staff or under their close control. The maintenance of a separate ranched stock also provides a degree of insurance in the event of an environmental disaster or breakdown of effective control of harvesting, owing, for instance, to political instability.

The cause of crocodilian conservation may therefore best be served, not by a cessation of all wild harvesting and a development of farming, but by the implementation of effective management plans, for wild populations, involving ranching, direct harvest, or a combination of the two. The success of any such management plan is entirely dependent on thorough background research to determine existing population levels, and on the ability to conduct the exploitation in a controlled manner. The high levels of illegal trade in crocodilian products suggests that the current degree of control is far from adequate in many parts of the world."

This cautious optimism is not based on theory alone: the well established practical success of crocodilian farming and managed harvests in Louisiana and Papua New Guinea is sound evidence of the benefits of such exploitation for the conservation of crocodiles and wild landscapes. Thorough studies of the management of wild and captive populations of the Mississippi Alligator in Louisiana began in 1959. In 1981, in an address to the International Herpetological Symposium at Oxford, England, John Tarver of the Louisiana Department of Wildlife and Fisheries described how their rigorously applied managed harvest of alligators, in conjunction with alligator farms and ranches, has ensured the survival of flourishing alligator populations and the wetlands in which they live. In conservation terms it has been a great success. Such success is difficult to object to.

Crocodile farms are now being established throughout the world, in increasing numbers. This book has entries for 51 countries. Though not all of them have true farms or commercial farms, it nevertheless indicates a great and rapidly growing interest.

The main species farmed or ranched are *Alligator mississippiensis, Crocodylus porosus, Crodylus niloticus,* and *Crocodylus novaeguineae,* chiefly in the USA, Australia, Thailand, Zimbabwe, South Africa and Papua New Guinea. Commercial farms produce, currently, about 12,000 skins out of a possible total trade of 82,000 (excluding Caimans). However, leather is not the only commercial basis for farming: a consistent feature is the importance of tourism as a source of revenue. In many instances income from tourism is the major income; most farms combine both features to some degree. There are other variations. An unexpected one is Taiwan, where 35 farms are recorded, producing about 2,000 hatchlings yearly, all the Common Caiman (*Caiman crocodilus*), the most valuable product of which is meat sold as food. Stocks of Gharials (*Gavialis gangeticus*), False Gharials (*Tomistoma schlegelii*), and Salt-water Crocodiles (*Crocodylus porosus*) are also being raised on the Taiwan farms for future breeding. Some farms are pure conservation exercises, such as the Madras Crocodile Bank Trust, breeding animals for release.

Nearly all of the world's species are being bred somewhere, many only in small numbers. The notable exception is the Black Caiman, *Melanosuchus niger,* which does not appear to be bred anywhere. This is the forgotten species of crocodilian conservation, neglected by farmers and conservation workers alike, its status scarcely known.

Reading the book, one is surprised by the extent and rapid development of farming. What is the future? Will farms and ranches finally replace wild hunting? With the current trend, probably. Much depends on the politics of conservation and its influence on international law. Each meeting of the members states of CITES results in some change in the law governing trade in the products of farms and ranches. It is by no means certain that the Convention will continue to permit this trade, as there is strong opposition to it from some conservation bodies. Witness the continuing hostility at CITES meetings to the Cayman Turtle Farm and the turtle ranching project in Suriname. Resolutions at the last CITES meeting in Buenos Aires in 1985 to permit trade in their products were defeated. Strangely, the same hostility has not been shown towards similar projects for crocodiles. Crocodile farming has, happily, avoided the same bitter controversy. But perhaps the existence of so many farms in so many of the states cannot be ignored by governments, and farming will be better allowed for in the future.

Another problem is that while farming is showing its benefits for conservation, preservationist organisations are campaigning to end sales of products made from crocodile skins, and appealing to the public not to buy them. Perhaps, when only legitimately farmed and ranched products are traded in, then, in the interests of conservation we will be encouraging people to buy crocodile skin bags! Consumer boycott campaigns will have to be reversed.

My own feelings are that crocodile farms are on the whole beneficial and it is to be hoped that their future development continues to be constructive, and not unnecessarily impeded.

Apart from its excellence as a source of information on crocodile farms, this book is useful in another respect: it indirectly reminds us that conservation is not merely the preservation of fragments of nature in a stable state, but the conservation of wild animals and plants as a renewable resource, integrated into local economies.

John Pickett

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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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