# IUCN TORTOISE AND FRESHWATER TURTLE SPECIALIST GROUP NEWSLETTER

December 1988 = n°1 or 2?

## FIRST CAPTIVE REPRODUCTION OF PODOCNEMIS EXPANSA

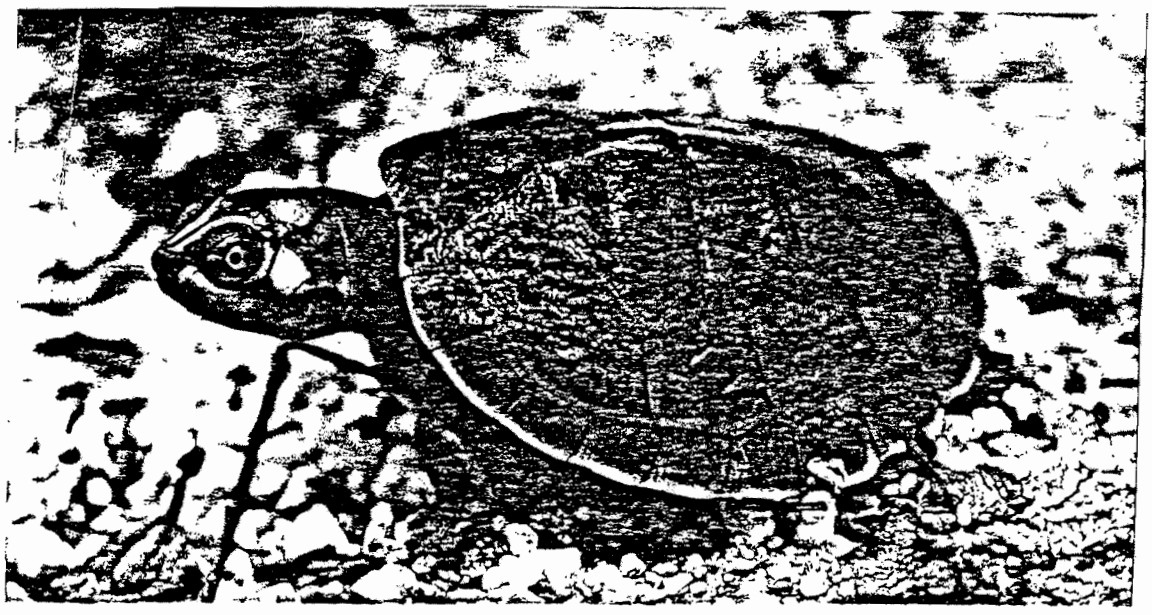
One of the most challenging of freshwater turtles, as far as captive breeding is concerned, is surely the South American giant river turtle, Podocnemis expansa. The very size of the adult females (60-80 cm in carapace length) presents problems enough for most zoos even to house, let alone to breed; the species, and its great sensitivity to cold requires that it be kept in a heated indoor facility in any zoo located outside the lowland tropics. Moreover, reproduction in this species is highly colonial, and appears to be cued, at least in part, by the falling of the water levels during the dry season in the Orinoco and Amazon River systems.

It is therefore a remarkable achievement of the Emperor Valley Zoo in Trinidad to have successfully produced 37 healthy hatchlings of this species in April and May 1988, and Zoo Director Hans Boos and Head Keeper John Seyjagat are to be congratulated on this achievement.

The breeding stock at the Emperor Valley Zoo consists of three females and one male, housed in a relatively small, concrete-lined, outdoor pool. The animals are the survivors of a larger group obtained 63 years ago -- even before the Zoo was established. For many years they made no attempt to breed. However, during the last few years, Boos and Seyjagat have manipulated the water level in the enclosure to simulate seasonal fluctuations in the wild, and they also created an artificial nesting habitat in the form of a large pile of deep, clean sand close to the water's edge. In the course of five years, non-viable clutches were produced on five occasions, and four other attempted nestings were witnessed.

Finally, on February 20 1988, a viable clutch of 42 eggs was deposited. Three hatchlings emerged on April 25, four on May 1, three on May 2, and 27 on May 9. Only one egg failed to develop, but in five cases full-term embryos died in the egg. The young (see enclosed photograph) were vigorous and healthy, and showed no mortality as of mid-June 1988.

P.C.H.Pritchard



NEWS OF PSEUDEMYDURA UMBRINA

The situation of the last wild animals of P. umbrina becomes more and more critical. Beginning of March 1988 a bush fire started in the Ellen Brook Reserve, and all the turtle habitat was burnt. One month later, in April, the south west swamp of the second reserve, Twin Swamps, was burnt after an airforce training aircraft crashed into it. We hope that the last dozen P. umbrina were buried deeply underground to escape damage - they aestivate during this time of the year. Ellen Brook has not been burned since 1962/63, Twin Swamps since 1974. The Department of Conservation and Land Management will now start an erradication programme of foxes and dogs in the two reserves, because there will be no cover or vegetation shelter when the turtles emerge from aestivation in May or June.

A brick company plans to open a new clay pit close to the Ellen Brook Reserve. The Environmental Protection Authority of Western Australia recommended that clay may be excavated about one kilometer from the reserve, but not as close as 50 m, because this could change water flow and ruin the habitat of the last turtles. The decision of the W.A. Minister of the environment has not yet been announced.

The improvements of the captive breeding situation of P. umbrina which were proposed in September 1987 (Kuchling, IUCN Tortoise and Freshwater Turtle Newsletter No 2) seem to have had a positive effect. By the end of October and the beginning of November 1987 two of the females in captivity ovulated. Clutches of three and four eggs were laid in November/ beginning of December, and all eggs have been incubated at 24° C. Six eggs started to develop, but unfortunately all died at an early stage. Possibly they were insufficiently equipped by the mother animals because of long-term deficiencies in nutrition. The temperature of 24° C is close to that recorded in the field at presumed nesting sites and should not have been a problem.

Although no hatchlings could be produced, the fact that some eggs have been laid after a standstill of seven years is a step fore ward and shows that the animals are not too old to reproduce. Another effect of the changes in captive condition due to the proposal was that all adult females left the water by the end of December and started to aestivate on the dry land. This normally happens in the wild, but up to now the captive animals have not aestivated regularly without being forced to and most have remained in the water during the whole year. The present captive conditions therefore seem to reflect more closely the natural ones.

It is clear that this first step is not at all sufficient for the persistence of P. umbrina. WWF-Australia, the W.A. Department of Conservation and Land Management, the Australian National Parks and Wildlife Service, Perth Zoological Gardens and the Department of Zoology of the University of Western Australia all agreed to support and fund a joint project with G. Kuchling as principal investigator to rescue the Western Swamp Turtle from extinction. Using the last 17 captive specimens, two captive breeding colonies will be established in Perth to produce as many offspring as possible. New enclosures and nurseries for young animals will be built during the next months. An ecophysiological approach to captive breeding will be tried.

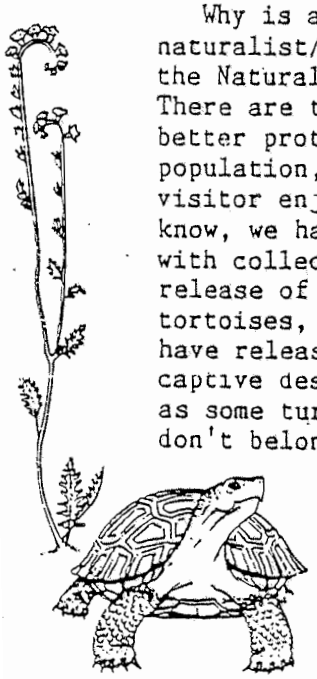
G. Kuchling, A.A. Burbidge, S.D. Bradshaw, J. DeJose

# FULL-TIME NATURALIST URGENTLY NEEDED FOR DESERT TORTOISE NATURAL AREA NEXT SPRING

The Desert Tortoise Preserve Committee's Board of Trustees recently identified a very high priority project for fund-raising with members, donors and new supporters. Our goal for 1988 and early 1989 is to raise at least $20,000 from our membership to support a full-time, skilled naturalist/manager at the Natural Area interpretive area next spring and to purchase an attractive motorhome to park at the interpretive area as a temporary visitor headquarters and living space for the naturalist.

Our project has the full support of the Bureau of Land Management and hopefully will become part of the federal Challenge Grant Program. Under the Challenge Grant Program, funds raised for our project will be matched with an equivalent amount of federal funds. Thus, if we raise $20,000, our dollars can be matched with $20,000 from the Bureau of Land Management for a total of $40,000. We are very optimistic about being included in the Challenge Grant program and will receive final word late this month.

Why is a full-time naturalist/manager essential for the Natural Area next spring? There are two critical reasons: better protection of the tortoise population, and enhancement of visitor enjoyment. As you already know, we have some serious problems with collecting of wild tortoises, release of unwanted captive tortoises, and vandalism. Visitors have released sick and injured captive desert tortoises, as well as some turtles and tortoises that don't belong in the desert!



Tour guides and Bureau of Land Management employees have reported finding a Texas tortoise, a box turtle, several sick captive desert tortoises, and even a large captive with its cracked shell covered with fiberglass. The presence of a naturalist/manager on site 5 days a week between March and June and at other heavy visitor use periods could substantially reduce the incidence of such problems.

Visitor use has increased tremendously at the Natural Area in the last few years. Several thousand people are now coming to the Natural Area each spring. For example, in mid-week this spring, often 50 to 75 people visited the kiosk in a three-hour period. Visitors unfamiliar with deserts can quickly become disappointed if they do not see tortoises or other animals, not realizing that tortoises and many other desert animals have very limited activity periods above ground. The naturalist/manager could enhance visitor enjoyment by greeting visitors, leading tours, answering questions, showing brief slide programs in a visitor area at the motorhome, and selling tortoise T-shirts and other Committee products.

Please join the Committee in our new project to protect the desert tortoise and increase visitor enjoyment. A form for your special contribution is provided in the newsletter. The sooner we can establish a full-time presence at the Natural Area, the more quickly we will be able to stabalize and protect the tortoise population.

Kristin H. Berry

## VIETNAMESE BOX TURTLES HATCH AT THE BRONX ZOO

Two Vietnamese box turtles (Cistoclemmys galbinifrons) hatched at the New York Zoological Park on 18 July after a 73-day incubation period. It is believed to be the first zoo hatching of this species. The parents were imported into the United States in 1985 and have been exhibited in Wild Asia JungleWorld. On 6 May, the female laid two 51-56mm-long china-like eggs on the tan bark substrate of her 40-square-foot enclosure that she shares with the male and two other females. Later the eggs were found covered by a small mound of the substrate material. They were removed and incubated at 27-28° C in vermiculite at a 1:1 by weight ratio with water. The 20g hatchlings had carapace lengths of 48 and 50mm. Five previous clutches, four single-egg and one two-egg, laid between December 1987 and May 1988 were infertile.

Little is known of the natural history of this species, and its reported range is restricted to the Tonkin region of Vietnam. The species first became available via Hong Kong dealers four years ago. It appears to be omnivorous, favoring conditions of high humidity and preferring temperatures ranging between 26-31° C.

(John Behler)



# MALAYSIAN TORTOISES QUESTIONNAIRE

Prepared by Dr. Edward O. Moll

Operation Tortoise is a project of the Tortoise and Freshwater Turtle Specialist Group of the IUCN aimed at determining the distribution and conservation status of the tortoises of the world. I have been assigned by the group to review the status of tortoises in tropical Asia. In order to obtain the most current information on the Malaysian species, this questionnaire is being sent to persons who may have direct information on these rare animals. Dr. Kiew Bong Heang of the University of Malaya has kindly agreed to serve as a repository for the completed questionnaires.

Three species of tortoises are known from peninsular Malaysia -- the Asian brown tortoise (six-legged tortoise), Manouria (Geochelone) emys, the impressed tortoise, Manouria (Geochelone) impressa, and the elongated tortoise, Indotestudo (Geochelone) elongata. To facilitate identification of these species a key and IUCN species identification sheets are included. If you have information on any of these tortoises, please take a moment and fill out one of these questionnaires. Your assististance will be greatly appreciated.

## Key to Malaysian Tortoises

1 Supracaudal scute single (undivided). Conical scutes on posterior of thighs small .....Elongated Tortoise, Indotestudo elongata.
1' Supracaudal scutes divided. One or more elongated spurs or pointed, conical scales at posterior of thigh.....2

2 Pectoral scutes reduced and do not contact at midline of plastron.....Asian Brown Tortoise, Manouria emys.
2' Pectoral scutes meet at midline of plastron. Anterior and posterior marginals usually strongly serrated....Impressed tortoise, Manouria impressa.

# General Notes

The carapace is covered with horny shields, frequently with distinct growth rings, and is usually strongly domed. It is connected by a broad bridge to the usually flat plastron.

The plastron of the male is usually concave.

The typical land-tortoise is easily recognized by its feet.

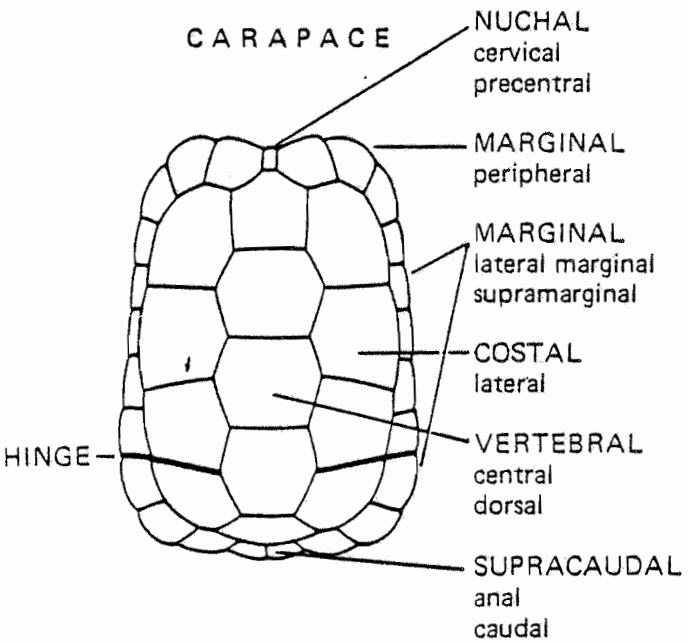
The digits are short, and show no trace of webs.

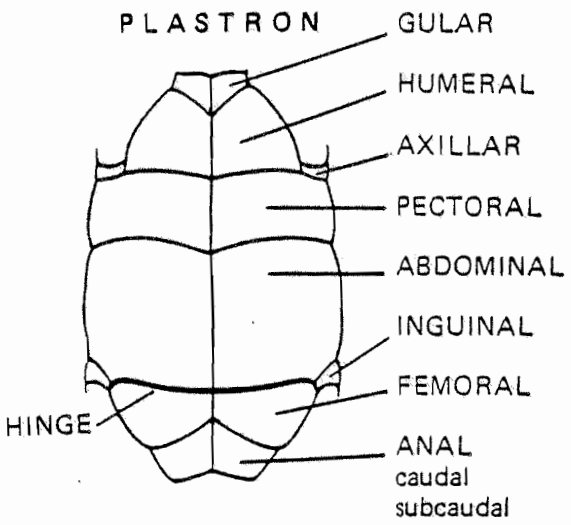
The hind feet are club-footed. The skin of the anterior side of the fore-limb is covered with strong horny scales.

The top of the head is covered with shields. The tail is relatively short. Head and neck are completely retractible within the solid shell.

Distribution: Tropical, subtropical and temperate zones, except Australia.

All members of the Family *TESTUDINIDAE* are terrestrial.




The epidermal shields of the turtle shell, shown on a hypothetical shell.

QUESTIONNAIRE

1. Have you seen any of the three species of terrestrial tortoises in the wild over the last five years? If so identify the species that you saw and provide as precise locality information as possible (State, District, Village, etc.)

2. Describe the area where each tortoise was seen in respect to vegetation (forest, grassland, agricultural land), altitude (foothills, mountain, lowlands), and moisture (wet, dry, near stream etc.).

3. When was the tortoise seen? Provide dates if possible otherwise month or season.

4. In your lifetime which of the three species of tortoises have you seen most often? Which have you never or only rarely seen? Do you see these three species as often, less often or more often today than you did 10 years ago? 20 years ago?

5. Have you seen any of these species being sold in markets or shops of animal dealers? If yes answer the following.
   a. Which species have your seen (include numbers if possible).

   b. How often are they present in the market or shop (always, commonly, rarely)?

   c. Are they being used for food or some other purpose (explain).

6. Do you have any observations about the following? If so be sure to indicate the species to which your observations apply.
   a. When do tortoises mate (dates or season)?

   b. When and/or where do tortoises lay their eggs?

   c. When do young hatch from nests?

   d. What do the tortoises eat?

   e. What eats tortoises (animals, Orang Asli etc.)?

7. Please add any other observations on Malaysian tortoises which are not covered above (Use the back if necessary).

Return this questionnaire to:

Dr. Kiew Bong Heang
Jabatan Zoologi
Universiti Malaya
Kuala Lumpur 22-11

Thankyou for your assistance.

Order Testudinata / Family Testudinidae

APPENDIX II

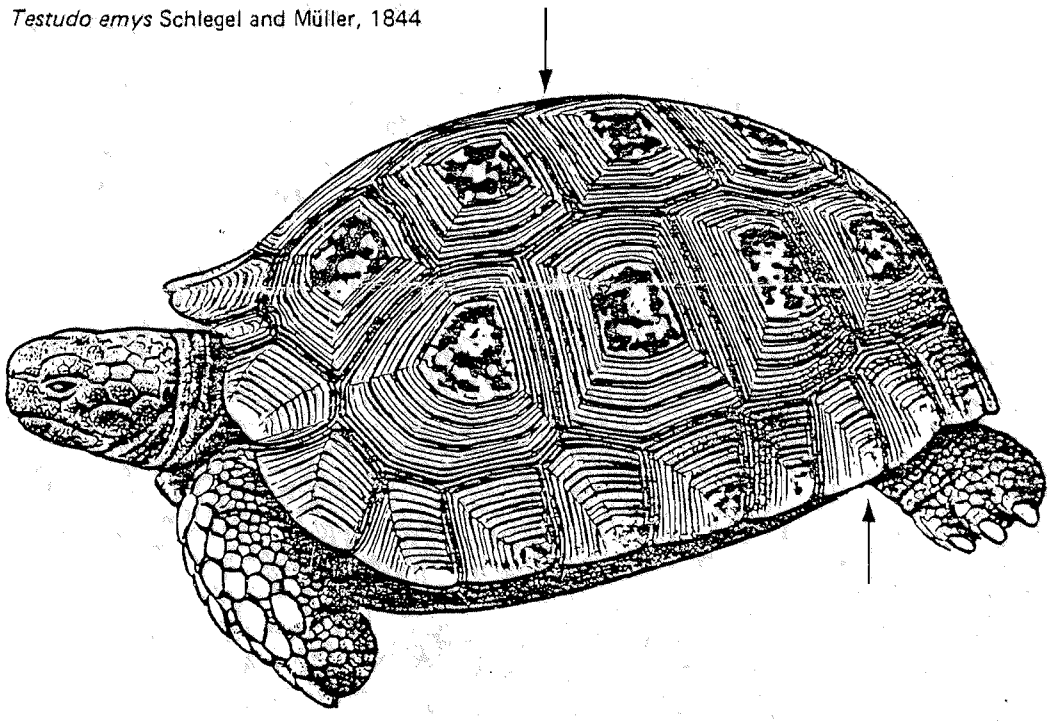
# Geochelone emys

(Schlegel and Müller, 1844)

**Common names:**

engl.: Burmese Brown Tortoise, Six-footed Turtle
esp.: Tortuga marron de Burma
fr.: Tortue brune de Burma
de.: Braune Landschildkröte

**Scientific synonyms:** *Testudo emys* Schlegel and Müller, 1844



**Characteristics:**

*Adult:*

Carapace: Depressed, flattened on vertebral region.

Plastron: Large, sometimes larger than carapace owing to the extended gular shields. The pectorals are widely separated.

Nuchal shield: present

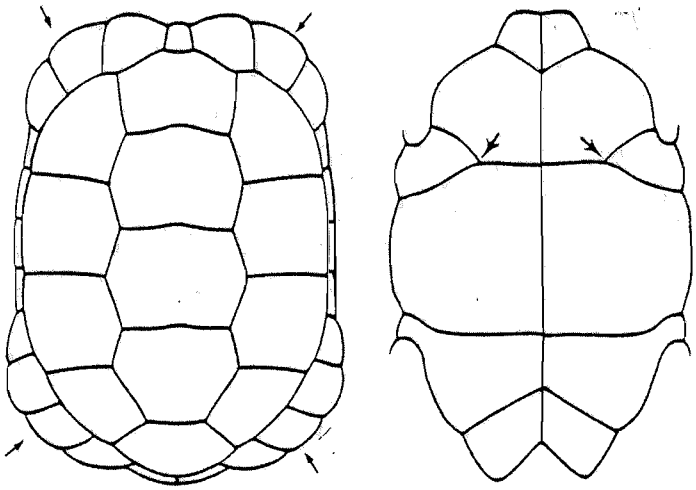
Supracaudal shield: divided

Tail: Terminating in a grooved spur-like tubercle.

Color: Shell dark brown or blackish, sometimes relieved by orange areolae. Head and limbs blackish. Carapace less strongly pigmented.

Extremities: Massiv; adults have a greatly enlarged conical scute on the back of the thigh (i.e. six-footed tortoise). Forelimbs with five claws, hind limbs with four claws.

Head: Massiv.

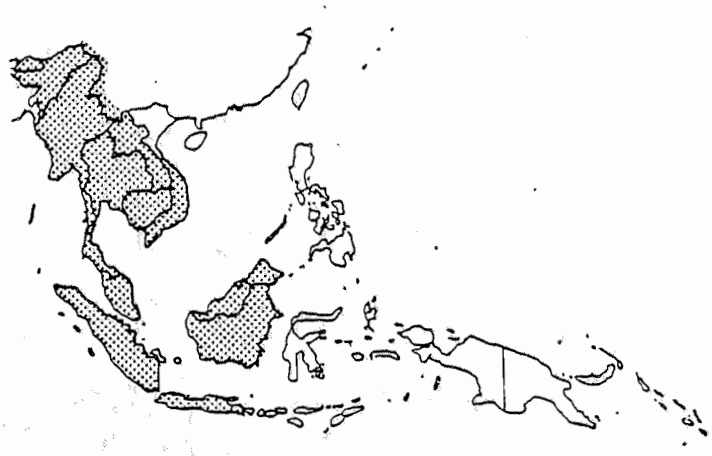


*Juvenile:*

Areolae lighter in color.

**Distribution:**

*Burma, China (?), India* (Assam), *Indonesia* (Sumatra, Borneo), *Kampuchea, Laos, Malaysia, Thailand, Viet Nam.*



**Population:** no data

**Trade:** main exporting state: Thailand
main importing states: United States of America, Federal Republic of Germany.

Trade volumes: 1740 specimens recorded by CITES Parties in 1978
20 specimens imported by Switzerland from 1975 to 1979

**Intraspecific variation:** none

**Similar species:** none

**Bibliography:**


Rooij, de N. (1915) The reptiles of the Indo-Australian Archipelago. I + II. Leiden

Taylor, E.H. (1970) The turtles and Crocodiles of Thailand and adjacent waters. U. Kansas Sci. Bull. 44: 87–179



Text: René E. Honegger, Zurich
Drawings: Urs Woy, Zurich
Submitted by the Management Authority of Switzerland

Order Testudinata / Family Testudinidae

APPENDIX II

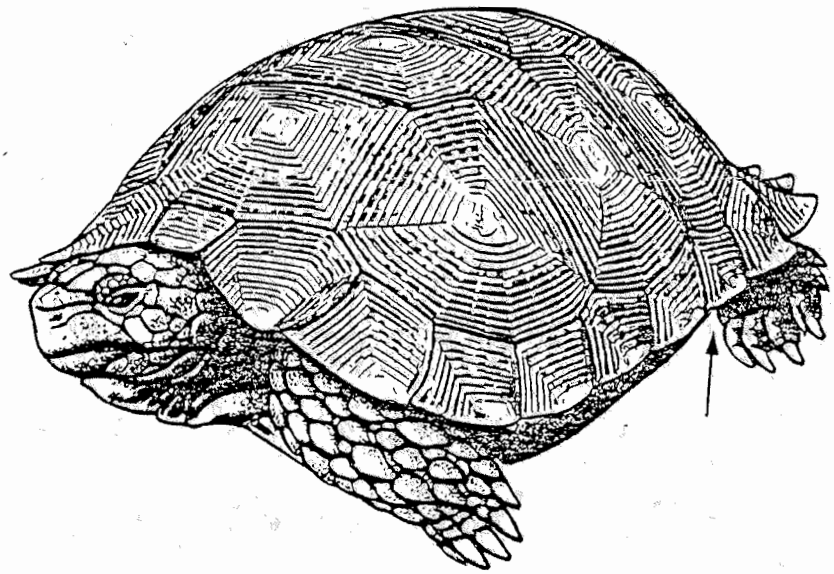
# Geochelone impressa

(Günther, 1882)

**Common names:**

engl.: Impressed Tortoise
esp.: Tortuga marron de Burma
fr.: Tortue imprimée
de.: Hinterindische Landschildkröte
ital.: Testuggine impressa

**Scientific synonyms:** *Testudo impressa* Günther, 1882



**Characteristics:**

*Adult:*

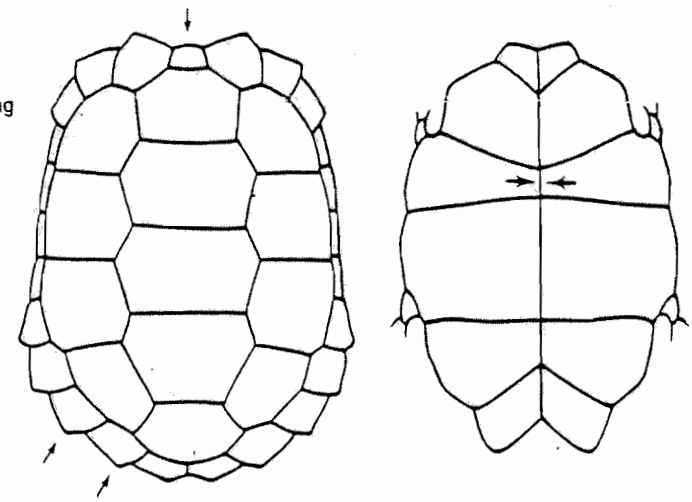
Carapace: Much flattened on vertebral region. Vertebral shields flat or concave. Marginals posteriorly and anteriorly splayed out and deeply serrated.

Plastron: Large, however not longer than carapace.

Nuchal shield: present, wide

Supracaudal shield: divided

Color: Carapace: dull brown to yellow, sometimes with some dark radiating marks or striking black edgings. Marginals lighter in color than the rest of the shell.
Plastron: yellowish-brown, with few darker brown markings. Some specimens have strongly defined dark rays on the plastron.



Extremities: limbs dark, covered with heavy scales.

Head: Top of head with distinct symmetrical shields. Color light-yellow.

*Juvenile:*

Strikingly fine black specks over carapace and head. Light yellowish-brown above, finely speckled with black.

**Distribution:**

*Burma, China (?), Kampuchea (?), Laos (?), Malaysia, Thailand, Viet Nam*

**Population:** no data

**Trade:** main exporting states: Thailand, Malaysia
main importing states: United States of America, Federal Republic of Germany

Trade volumes: 2015 specimens recorded by CITES Parties in 1978,
176 specimens imported from Thailand by Federal Republic of Germany in 1979
9 specimens imported by Switzerland from 1975 to 1979

**Intraspecific variation:** none

**Similar species:** none

**Bibliography:**


Smith, M.A. (1931) Fauna of British India. Reptilia and Amphibia. Vol. I

Taylor, E.H. (1970) The turtles and crocodiles of Thailand and adjacent waters. U. Kansas Sci. Bull. 44: 87–179



Text: René E. Honegger, Zurich
Drawings: Urs Woy, Zurich
Submitted by the Management Authority of Switzerland

Order Testudinata / Family Testudinidae

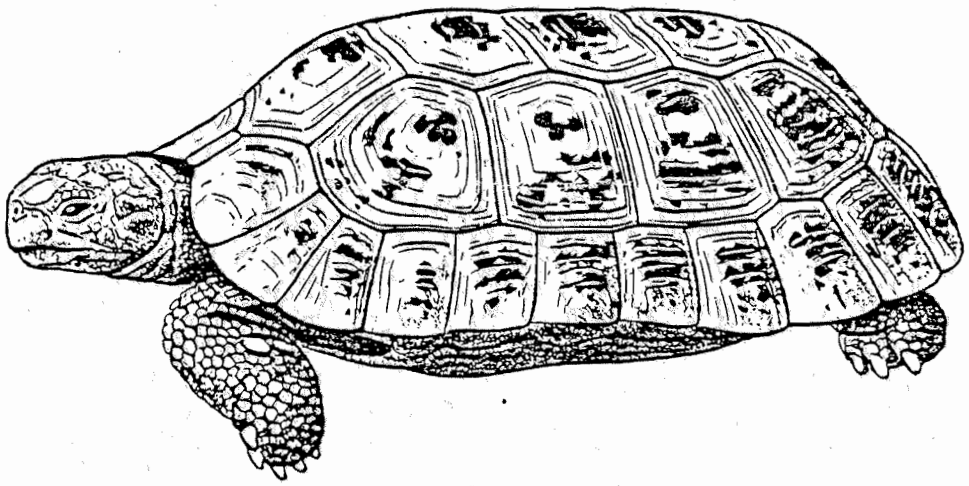
APPENDIX II

# Geochelone elongata

(Blyth, 1853)

**Common names:**
engl.: Red-nosed Tortoise, Yellow Tortoise, Yellow-headed Tortoise
esp.: Tortuga dorada de Burma, Tortuga de nariz roja
fr.: Tortue à tête jaune
de.: Gelbkopfschildkröte
ital.: Testuggine a testa gialla

**Scientific synonyms:** *Testudo elongata* Blyth, 1853



**Characteristics:**

*Adult:*

Carapace: Elongate, narrow; flattened on the ventral part in the adults. Marginals sometimes serrated and flared posteriorly.

Nuchal shield: present (elongate)

Supracaudal shield: undivided

Tail: Terminating in a large horny tubercle.

Color: Carapace yellow or greenish-yellow, with variable amounts of black irregular markings. Large dark spots on marginals.

Extremities: Forelimbs with large imbricate, pointed scales. Spurs on thighs small.

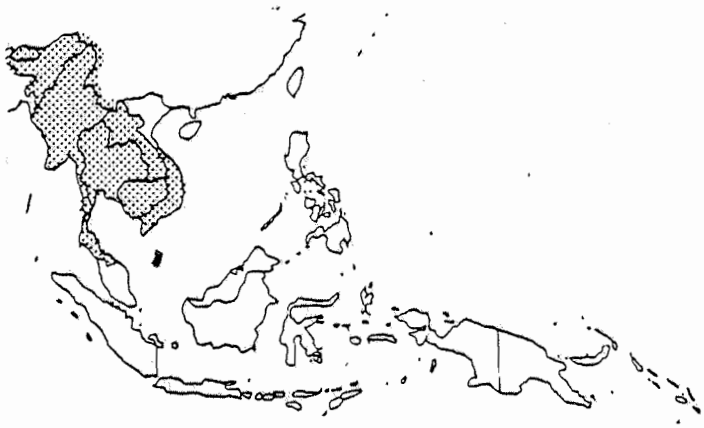
Head: During the breeding season males develop a reddish coloration around the front of the whitish-yellow head. Top of head with symmetrical scales.

*Juvenile:*

Carapace pure yellow, with few black markings on vertebralia and costalia; marginals markedly serrated and flared.

**Distribution:**

*Bangladesh, Burma, China, India, Kampuchea, Laos, Malaysia, Nepal, Thailand, Viet Nam.*



**Population:** no data

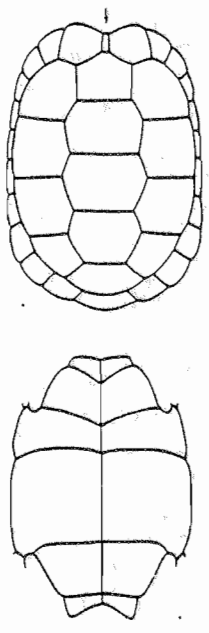
Code A-301.011.003.006

**Trade:** main exporting state: Thailand
main importing states: United States of America, Federal Republic of Germany, Switzerland, United Kingdom

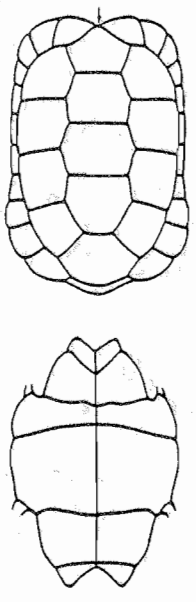
Trade volumes: 2774 specimens recorded by CITES Parties in 1978,
260 specimens imported from Thailand by FRG in 1979
150 specimens imported by Switzerland from 1975 to 1979

**Intraspecific variation:** none

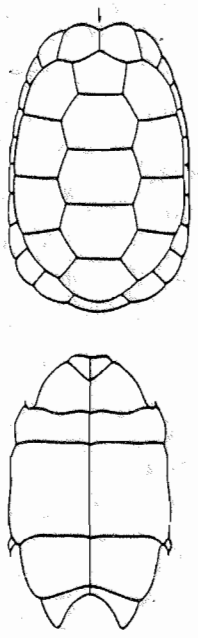
**Similar species:** *Geochelone forstenii*
*Geochelone travancorica*



*Geochelone elongata*



*Geochelone forstenii*
(see A-301.011.003.008)



*Geochelone travancorica*
(see A-301.011.003.015)

**Bibliography:**


Taylor, E.H. (1970) The turtles and Crocodiles of Thailand and adjacent waters. U. Kansas Sci. Bull. 44: 87–179

Smith, M.A. (1931) Fauna of British India. Reptilia and Amphibia. Vol. I.



Text: René E. Honegger, Zurich
Drawings: Urs Woy, Zurich
Submitted by the Management Authority of Switzerland

# FIRST WORLD CONGRESS OF HERPETOLOGY

**University of Kent at Canterbury (UK) 11–19 September 1989**

Ecology Research Group, Rutherford College, University of Kent, Canterbury, Kent CT2 7NY, U.K. Telephone (0227) 764000 x 3501 Telex 965 449

June 1988

Dear Colleague

I am delighted that you are considering coming to the First World Congress of Herpetology which promises to be the largest herpetological meeting ever held with over 2000 enquiries from over 60 countries. Many people have provisionally registered already but if you want to be sure of a place please complete the registration form now and mail it to me without delay. We only have places for 1000 delegates and 600 accompanying partners and there is every indication that we will easily exceed this number of applications.

Every conceivable topic is covered by our scientific programme whether you are most concerned about conservation, taxonomy, advances in behavioural and evolutionary ecology, or the problems facing herpetological field research, to name but a few areas in the 44 symposia, roundtables and workshops. The poster sessions are a prominent and important part of the Congress and I do urge you to consider sending a completed abstract form to the posters manager, or, if you want to present a spoken paper, then send the abstract form to the senior convenor of the appropriate symposium (addresses inside this booklet). Many trips and tours are planned for those who want to see the UK, Europe and other parts of the world, and the Congress has an extensive social programme. Everybody will find something relevant to their interests and concerns, and all will be welcome.

On behalf of my UK colleagues and the First World Congress of Herpetology I look forward to greeting you in Canterbury in 1989, and if you have any difficulties or problems regarding the Congress please do not hesitate to contact me,

with best wishes,

yours sincerely,

Ian R Swingland

Dr. Ian R. Swingland



**FIRST WORLD CONGRESS OF HERPETOLOGY**
University of Kent, Canterbury, Kent, England
11-19 September 1989
*Patron*: HRH Prince Philip, The Duke of Edinburgh, KG, KT
*Hon. President*: Professor Angus d'A Bellairs
*Director*: Dr. Ian R. Swingland

The First World Congress of Herpetology will be held in Canterbury, England from 11 to 19 September 1989 under the auspices of the World Congress of Herpetology and organised and managed by the Secretariat and National Executive of the UK Organising Committee and the Ecology Research Group at the University of Kent. If you would like to register please fill out the enclosed registration form and send the appropriate deposit together with the registration form to the Director:- Dr. Ian R. Swingland, First World Congress of Herpetology, Ecology Research Group, Rutherford College, University of Kent, Canterbury, Kent CT2 7NY, United Kingdom, tel (0227) 764000 ext 3754/3501; telex 965449; fax (0227) 459025. If you pay by using a credit card please specify the type AMEX, Visa, Diners, Access or MasterCard and your billing address for the card if it differs from your professional address. If you use the mail transfer slip please tear it off and send it to your Bank - it is the cheapest form of payment.

If you want to contribute a paper or poster please fill out the enclosed abstract form and follow the instructions.

**Stewards**
Those who may be interested in assisting with the day-to-day routine work of the Congress, and who read and speak fluent English apart from other languages, may apply for reduced registration fee and accomodation. Positions will be very limited. Those interested in acting as a steward are asked to write for an application form to Dr. Richard Griffiths, Department of Biological Sciences, NESCOT, Reigate Road, Ewell, Epsom, Surrey KT17 3DS. Enclose a brief *curriculum vitae*.

**Subsidy for Students and Delegates**
Subsidies to attend the First World Congress of Herpetology may be available. For further information and application forms please write to Dr. Marinus S. Hoogmoed, Chairman, Subsidy Panel, Rijksmuseum van Natuurlijke Historie, Postbus 9517, 2300 RA Leiden, The Netherlands. The panel will favour those who provide evidence that they have sought funding locally.

## SCIENTIFIC PROGRAMME

**Plenary lectures**

P1.Carl Gans (USA), State of herpetology

P2.Ilya Darevsky (USSR), Evolution and ecology of parthenogenetic lizards

P3.Zhao Erml (China), Biogeography of South America

P4.Russ Mittermeier (USA, presenter) & Ian Swingland (UK), International Conservation

P5.Tim Halliday (UK), Sexual selection

P6.Linda Maxson (USA), Systematics and phylogeny

P7.Armand de Ricqles (France), Palaeoherpetology

P8.Stephen D. Bradshaw (Australia), Ecological physiology

P9.Eric Pianka (USA), Community ecology

P10.David Wake (USA), Evolutionary biology of salamanders.

John Maynard Smith (UK), Evolutionary ecology

Gerald Durrell (UK), Conservation and captivity

**Symposia**

S1. Conservation and management of species
- Brian Groombridge (UK) and Emilio Balletto (Italy)
- IUCN Conservation Monitoring Centre, 219c Huntingdon Road, Cambridge CB3 0DL, UK

S2. Effects of environmental pollution on herpetofauna
- Arnold Cooke (UK) and Claes Andren (Sweden)
- Nature Conservancy Council, Northminster House, Peterborough PE1 1UA, UK

S3.Captive management
- Rene Honegger (Switzerland) and Romulus Whittaker (India)
- Zoo Zürich, CH-8044 Zürich, Switzerland

S4.Health and disease
- John Cooper (UK) and Fredric Frye (USA)
- Royal College of Surgeons, 741 Plum Lane, 35-43 Lincoln's Inn Fields, London WC2A 3PN, UK

S5.Sexual selection and communication in amphibians and reptiles
- Murray Littlejohn (Australia) and Stevan Arnold (USA)
- Department of Zoology, University of Melbourne, Parkville, Victoria 3052, Australia

S6.Environmental Sex Determination
- Claude Pieau (France) and Nicholas Mrosovsky (Canada)
- Institut de Recherche en Biologie Moléculaire, CNRS, Université Paris VII,Tour 43, 2 place Jussieu, 75251 Paris cedex 05, France

S7.Orientation, navigation, nervous system and senses in amphibians and reptiles
- Hans Schneider (Germany) and John Phillips (USA)
- Zoologisches Institut, Poppelsdorfer Schloss,5300 Bonn 1, West Germany

S8.Long-term studies of reptiles and amphibians
- Whitfield Gibbons (USA) and Henk Strijbosch (Netherlands)
- Savannah River Ecology Laboratory, Drawer E, South Carolina 29801, USA

S9.Snake behaviour and ecology
- Hubert Saint-Girons (France) and Richard Shine (Australia)
- Laboratoire d'Evolution, 105 Blvd. Raspail,75006 Paris, France

S10.Ecology and adaptations in extreme environments
- S.D. Bradshaw (Australia) and L.J. Borkin (USSR)
- Department of Zoology, University of Western Australia, Nedlands, WA 6009, Australia

S11.Amphibian and lizard community ecology
- Robert Barbault (France) and Masafumi Matsui (Japan)
- Laboratoire d'Écologie, E.N.S., 46 rue d'Ulm, 75230 Paris cedex 5, France

S12.Herpetofaunas: explorations and studies
- Zhao Erml (China) and Don Broadley (Zimbabwe)
- Chengdu Institute of Biology,Academia Sinica, Chengdu, Sichuan, People's Republic of China

S13.Evolution and phylogeny of frogs
- Raymond Laurent (Argentina) and Michael Tyler (Australia)
- Fundacion Miguel Lillo, Miguel Lillo 205, San Miguel de Tucuman, Argentina

S14.Origin of the amphibia and reptilia - paleontological evidence
- Leonid Tatarinov (USSR) and Robert Carroll (Canada)
- Paleontologichesky Institut AN SSSR ,Profsoyuznaya 113,117321 Moscow, USSR

S15.Paleoherpetology; impact on neoherpetology
- Richard Estes (USA) and Borja Sanchiz (Spain)
- Department of Biology, San Diego State University, San Diego, California 92182, USA

S16.Island herpetofaunas
- Thomas Schoener (USA) and Ronald Nussbaum (USA)
- Department of Zoology, University of California, Davis, California 95616, USA

S17.Chelonia: life history evolution
- Justin Congdon (USA) and Colin Limpus (Australia)
- Savannah River Ecology Lab,Drawer E,Aiken, South Carolina 29801, USA

S18.Molecular systematics
- Herbert Dessauer (USA) and Eviatar Nevo (Israel)
- Department of Biochemistry, Lousiana State University, Medical Center,New Orleans, Louisiana 7011: 1393, USA

S19.Cytogenetics
- Ettore Olmo (Italy) and Midori Nishioka (Japan)
- Università Degli Studi di Napoli, Dipartimento di Biologia Evolutiva e Comparata, Facolta di Scienze, V Mezzocannone 8, 80134 Napoli, Italy

S20.Parthenogenesis and hybridogenesis
- John Wright (USA) and Rainer Gunther (Germany)
- Section of Herpetology, Museum of Natural History,Los Angeles, California 90007, USA

S21.Systematics and phlogeny
- William Duellman (USA) and Olivier Rieppel (Switzerland)
- Museum of Natural History, University of Kansas, Lawrence, Kansas 66045, USA

S22.Biology and genetics of *Pipidae*
- Richard Tinsley (UK) and Linda Trueb (USA)
- School of Biological Sciences, Queen Mary College, Mile End Road,London E1 4NS, UK

S23.Energetics
- Warren Porter (USA) and Raymond Huey (USA)
- Department of Zoology, University of Wisconsin, Madison, Wisconsin 53715, USA

S24.Ecological Physiology
- Harvey Pough (USA) and Roger Seymour (Australia)
- Section of Ecology and Systematics, Cornell University, Corson Bldg., Ithaca, New York 14853-2701 USA

S.25.Functional morphology
- Carl Gans (USA) and Jean-Pierre Gasc (France)
- Division of Biological Sciences, University of Michigan, Ann Arbor, Michigan 48109, USA

S26.Reproductive physiology
- Paul Licht (USA) and Louis Guillette (USA)
- Department of Zoology, University of California, Berkeley, California 94720, USA

S27.Development processes
- Angus Bellairs (UK) and James Hanken (USA)
- 7 Champion Grove, London SE5 8BN, UK

**Workshops**

W1.Skeletochronology
- Jacques Castanet (France) and Ella Smirina (USSR)
- Université Paris VII, Laboratoire d'Anatomie Comparée, 2 Place Jussieu, 75251 Paris cedex 05, France

W2.Field methods and biotelemetry
- Jan van Gelder (Netherlands) and R.S.Mackay (USA)
- Zoölogisch Laboratorium der KU, Toernooiveld, 6525 ED Nijmegen, Netherlands

W3.Molecular techniques
- David Hillis (USA) and Craig Moritz (Australia)
- Department of Zoology, University of Texas, Austin, Texas 78712-1064, USA

W4.Amphibian larvae
- Richard Wassersug (Canada) and Barry Valentine (USA)
- Anatomy Department, Tupper Building, Dalhousie University, Halifax, NS B3H 4H7, Canada

W5.Phylogenetic analysis
- Roger Thorpe (UK) and Garth Underwood (UK)
- Department of Zoology, University of Aberdeen, Tillydrone Avenue, Aberdeen AB9 2TN, Scotland, UK

W6.Photographic techniques
- David Curl (UK) and David Dennis (USA)
- Ecology Research Group, Rutherford College, University of Kent, Canterbury, Kent CT2 7NX, UK

**Roundtables**

R1.IUCN Herpetology Specialist Group and SEH/BHS Conservation Committee open meetings
- Keith Corbett (UK)
- Pinetree Lodge, 30 Endfield Road, Moordown, Bournemouth, BH9 1TH, UK.

R2.Conservation problems
- Arne Schiotz (Denmark) and Gustavo Aguirre (Mexico)
- Denmarks Akvarium, Charlottenlund, Denmark

R3.Egg Games; optimal egg size and clutch size
- Henry Wilbur (USA) and Laurie Vitt (USA)
- Department of Zoology, Duke University, Durham, North Carolina 27706, USA

R4.Mimicry and predator/prey behaviour
- Edmund Brodie (USA) and Harry Greene (USA)
- Department of Biology, University of Texas, Arlington, Texas 76010, USA

R5.The ecology of the tuatara
- Michael Thompson (New Zealand) and Marie Charlotte Saint Girons (France)
- Department of Zoology, Private Bag, Victoria University, Wellington, New Zealand

R6.Herpetoblogeographic review of the continents
- Jay Savage (USA) and Charles Blanc (France)
- Department of Biology, University of Miami, P.O. Box 249118, Coral Gables, Florida 33124, USA

R7.Caecilian biology and evolution
- Michel Delsol (France) and Marvalee Wake (USA)
- Faculté Catholique des Sciences, 25 rue du Plat, 69288 Lyon cedex 1, France

R8. to be announced

R9.Field research and National regulations
- Harold Cogger (Australia) and Stephen Edwards (USA)
- The Australian Museum, P.O. Box A285, Sydney South, NSW, Australia

R10.Amateur contributions to herpetology
- Wolfgang Bohme (Germany) and Ray Ashton (USA)
- Bonn, Germany or write Ashton, Massachusetts Audubon Society, Lincoln, MA 01773, USA

R11.Medical and research aspects of venoms
- Jose Cei (Portugal) and Sherman Minton (USA)
- Rancho Somuncura, Rua Fausto de Figueiredo, Birre-2750-Cascais, Portugal

**General Meetings**

African Amphibian Working Group - 7th Symposium (Jay Savage, Convenor)
Society for the Study of Amphibians and Reptiles - 1989 AGM (Henri Seibert, President)
Herpetologists' League - 1989 AGM (James R. Dixon, President)
Societas Europaea Herpetologica - 1989 OGM (Ulrich Joger, General Secretary)
IUCN Amphibian and Reptile Specialist Groups (closed) - (David Stubbs)

ACKNOWLEDGEMENTS

The Director acknowledges the help and support he has received from the New York Zoological Society Personal Bibliographic Software Inc.; Zoological Society of London; Kirin Computing Ltd.; Care for the Wild; Fauna and Flora Preservation Society; People's Trust for Endangered Species; Midland Bank particularly Mr. Peter Wheatley and Mr. George Harvey; British Airways. Various people have been especially supportive Mr. Derek Butler, Mr. Chris Lancaster and Ms. Lesley Farr, Estates Office and Print Unit, UKC; Ms. Liz Cable and Mr. Peter Jordan, Conference Office, UKC; Mr. Peter Moss, Mr. D'Arcy Lowdell and Ms. Linda Ellis, EcoTravel; School of Continuing Education, UKC; Prof. Angus Bellairs; Dr Roger Avery; Mr. Thomas Langton; and members of the Organising Committee and National Executive. He is especially grateful to the Vice Chancellor of the University of Kent without whom the First Congress would not have been possible.

He would particularly like to thank his wife without whose support the last five years planning and preparation would have been impossible.