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SSAR BALLOT ENCLOSED

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Membership is open to anyone interested in amphibians and reptiles. Members have voting privileges in the Society. They receive the **Journal of Herpetology** (four issues per year), **Herpetological Review** (four issues per year), occasional issues of **Facsimile Reprints in Herpetology,** and **Recent Herpetological Literature.** Members may purchase other Society publications at reduced rates.

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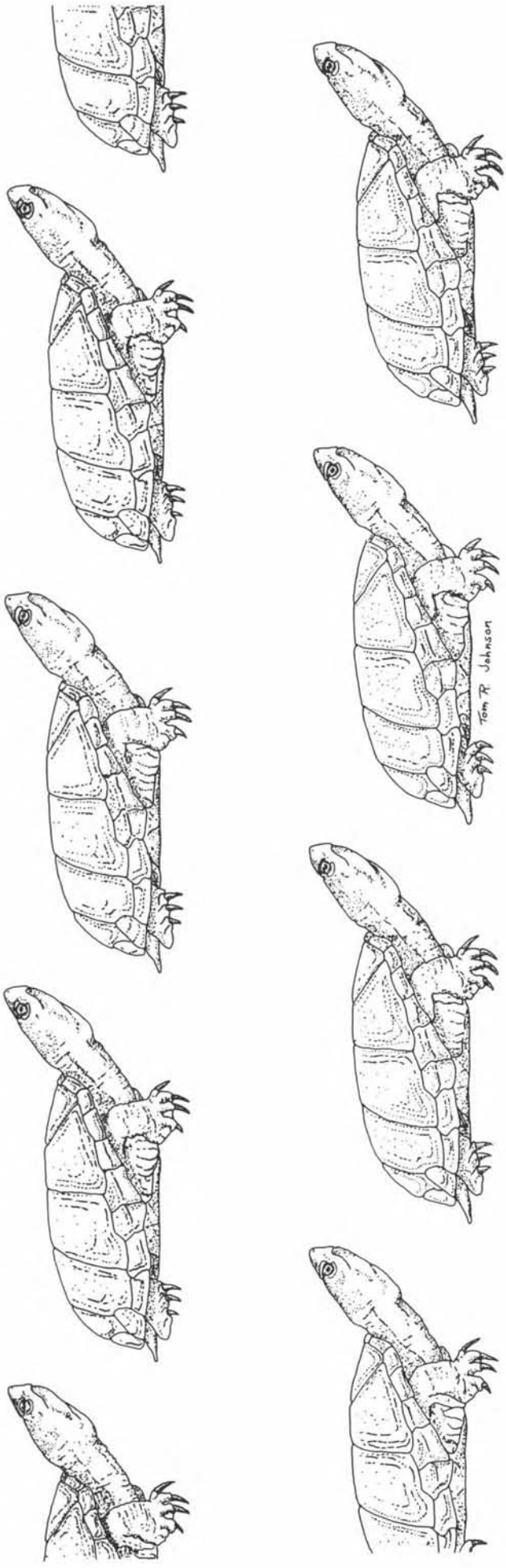

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Contents

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1985 ANNUAL MEETING

The 1985 annual meeting will take place at The University of South Florida in Tampa, 4-9 August.

SSAR members are reminded that the Tampa meeting will include the ever-popular Annual Auction of herpetologically related books and other items. It is not too early to start collecting your collectibles, forwarding them (or a statement of your intention to bring them) to meeting chairman:

Henry R. Mushinsky
Department of Biology
University of South Florida
Tampa, Florida 33620, U.S.A.

David Dennis and Kraig Adler, co-producers of the "Herpetologists Then and Now" slide presentation given at the Oklahoma ASIH/HL/SSAR meeting, request that society members send them duplicate slides of memorable (or forgettable) herpetological happenings — and their participants — for inclusion in future presentations. Anonymity of donors is guaranteed. Slides should be mailed to:

David M. Dennis
General Biology Section
The Ohio State University
1060 Carmack Road
Columbus, Ohio 43210, U.S.A. ●

SSAR BUSINESS

SYMPOSIUM PROPOSALS FOR 1986 SSAR MEETING

Proposals for symposia for the **1986** SSAR meeting are now being accepted. In order to allow for necessary planning and coordination of symposia, the *deadline* for receipt of proposals for the **1986** meeting is 1 JANUARY 1985. Further information may be obtained from, and proposals submitted to:

Dr. Lynne Houck
Department of Biology
University of Chicago
1103 E. 57th Street
Chicago, Illinois 60637, U.S.A. ●

1984 SSAR GRANTS-IN-HERPETOLOGY AWARDS

The Society for the Study of Amphibians and Reptiles is pleased to announce the following awards in the 1984 Grants-in-Herpetology Program:

GRADUATE STUDENT RESEARCH:

Trip Lamb, Department of Zoology, University of Georgia. "An investigation of introgressive hybridization between the barking treefrog *(Hyla gratiosa)* and the green treefrog *(Hyla cinerea)* using mitochrondrial DNA analysis." $280.

Martha K. Pancak, Department of EPO Biology, University of Colorado. "Endocrine regulation of oocyte development in the Bidder's Organ, a remnant ovary in male toads." $280.

REGIONAL HERPETOLOGICAL SOCIETY PROGRAMS:

Joseph C. Mitchell, Department of Biology, University of Richmond. "Reptiles and amphibians of far southwestern Virginia: a biogeographical and ecological survey." $240.

Yehudah L. Werner, Department of Zoology, Hebrew University of Jerusalem. "A gecko research facility." $350.

HERPETOLOGICAL CONSERVATION:

Robert E. Herrington, Department of Zoology, Washington State University. "The ecology, distribution, and habitat requirements of the Larch Mountain Salamander, *Plethodon larselli*." $430.

HERPETOLOGICAL RESEARCH IN ZOOS:

Michael K. Stoskopf, National Aquarium in Baltimore. "Amino glycoside kinetics in 3 families of Anura." $400.

FIELD WORK:

Calvin A. Porter, Department of Zoology, Brigham Young University. "Chromosomal variation in the iguanid lizard *Sceloporus grammicus* in central Mexico." $215.

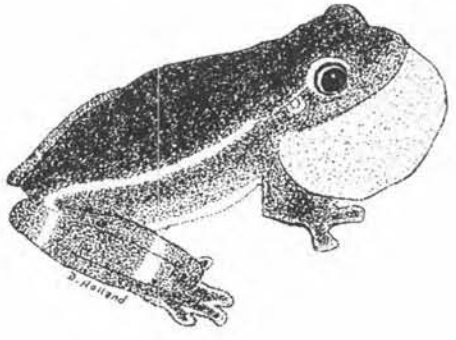
Mac F. Given, Biological Sciences Group, University of Connecticut. "Social behavior and acoustic interactions of the carpenter frog, *Rana virgatipes*." $215.

The number of proposals received in each category for this year and last year is:

	1984	1983
Conservation Research	9	15
Field Work	9	—
Graduate Student Research	33	34
Regional Herp. Societies	4	5
Zoo Research	5	0
Total:	60	54

SSAR extends its congratuations to all recipients of awards and encourages the submission of proposals for next year's program. Further details on the 1985 Grants-in-Herpetology program, and the deadline for receipt of proposals, will appear in the December issue of *HR*.

SSAR expresses its thanks to the 1984 Grants-in-Herpetology Committee, composed of Linda R. Maxson (Chairperson), James P. Bacon (Herpetological Research in Zoos), Donald C. Forester (Field Work), John B. Iverson (Herpetological Conservation), Robert W. Murphy (Graduate Student Research), and Malvin L. Skaroff (Regional Herpetological Society Programs). ●



IN MEMORIAM — FEDERICO MEDEM

On May 1, 1984, Federico Medem died of cancer in Bogotá, Colombia. He is survived by his widow, Flor Angela and daughter, Dina Maria. Not only has herpetology lost one of its most dedicated scholars, but more, the world has lost a rare human being; a man unaffected by the legend that was his life.

Friedrich von Medem Medem was born August 29, 1912 in Riga, Latvia. His family was nobility and many were notables at the Imperial Russian Court. An uncle and grandfather were generals in the Russian Army. His other grandfather had been chief of diplomatic mission from the tsar to China and so outstanding were his accomplishments, that when he died there, the other legations erected a monument to honor his memory.

In 1917, the Bolshevik Revolution obliged the Medems to flee their palatial estates and young Friedrich was taken to Berlin. From 1925 to 1928, he attended gymnasia in Namslau and Liegnitz, Silesia and then returned to Riga to receive his diploma in German humanities. Between 1936 and 1940, he studied at the Humboldt University and the University of Tuebingen. He then went to the Stazione Zoologica in Naples, Italy to research his doctoral thesis. He received his doctorate in Natural Sciences from Humboldt University in 1942 and later worked as assistant to the director of the Max Planck Institute in Hechingen, Germany. In those years, a dark star was rising over Germany and Medem watched with horror the lunatic rantings of Adolph Hitler. Although he wished only to occupy himself with science and literature, he could not dissemble his loathing for the new Nazi regime and he was eventually drafted into a special batallion of political dissidents and sent to the Russian front, where he was seriously wounded. After the war, he went to the Institute of Zoology at Berne University in Switzerland as an instructor. There he met Doctor Mario Laserna, who invited him to teach at the new University de Los Andes in Bogotá, Colombia.

In June, 1950, he arrived in Colombia. This was his first time in the Americas and although he spoke Russian, German and Italian fluently, he knew practically no Spanish. His finances were equally meager and he often referred to himself as a displaced person at that point in his life. Vicissitudes such as these never deterred him, however, and in the next thirty-four years he would establish himself as the foremost naturalist in the country and one of the world's leading experts on the natural history of crocodilians. Along the way, he adopted the name Federico, acquired Colombian citizenship and married his beautiful Colombian wife.

During his early years in Colombia, Federico lived for months among indian tribes, many of whom had probably never seen any outsider. With them, he explored the forests and rivers, submersing himself totally in the study of their exciting tropical world. His methodical nature and his absolute disregard for pain and discomfort impressed them greatly. One Guahibo tribe not only adopted him, but gave him one of the specially carved

wooden stools reserved solely for caciques. Federico was similarly impressed by the indians and identified with their spiritual kinship with Nature. Among his many stories about the tribes he had lived with were those about their sense of humor. Although they are quite prudish about personal sexual matters, they delight in the coarsest jokes and insults directed at one another and sometimes at the strange white man who was in their midst. Count von Medem, descended of a long line of nobility, was as unaffected by their stinging wit as he was by the vicious bites of the huge tabanids whose primary hosts were crocodiles and caimans. A species of this fly was named *medemi,* which not only honors him as its discoverer, but also commemorates his legendary indifference to the bite. The list of new species and subspecies named after him spans the orders of the animal kingdom, most named to honor Federico as discoverer.

Between 1953 and 1961, Medem received two separate grants from the Guggenheim Foundation to travel in the United States, to meet with colleagues and to study specimens preserved in museums and universities. In later years, he would sponsor other young scientists for similar grants. Then, for the next five years, he directed the Faunistic Section of the Corporación Autonoma Regional de los Valles del Magdalena y Sinu at Cartagena. It was there that he met and married Flor Angela Cortés.

In 1966, Federico was named director of the 'Roberto Franco' Institute in Villavicencio, which had been the site of the famous malaria research by Marston Bates and others in the 1940s. Villavicencio, at the foot of the Andes, is the gateway to the great Colombian savannahs and the rain forests to the south. Federico never enjoyed the higher altitudes and this new environment suited him perfectly. A year later, the National University appointed him full professor in a non-teaching capacity that he might devote all his time to his research. His more than ninety publications, including two books, attest to his tireless work.

In 1972-73, he traveled throughout South America gathering scientific data and studying the growing commerce in reptile hides. The trip was sponsored by the New York Zoological Society. He worked constantly to inform the world of the serious depredations upon wildlife species, especially the crocodilians. He was a born conservationist; a conservationist long before it became the thing to be. In the years to come, he would atttend international conservation congresses in Australia, New Guinea, Switzerland, India, Costa Rica and the U.S. In 1981, he was retained by FAO to go to Botswana and evaluate a management and conservation project for Nile crocodiles. For the last several years of his life, he was vice-chairman of the IUCN/SSC for all of South America. In September, 1983, the National University awarded him its highest possible academic tribute, the Medalla Al Merito Universitario. At that time, he was working on the manuscript of his third book, The Turtles of Colombia, which he was never to see completed.

For almost two decades, Fred Medem's home in Villavicencio was a mecca for colleagues, students and friends from all parts of the world. His courtly charm was denied to none and the only credentials needed was a sincere desire for knowledge. He was impatient with any sort of affectation or pretentiousness. He had none himself.

I first met Fred in February, 1979, while I was working to develop a zoo near Bogotá. In 1980, he invited me to live at the Institute and work for him as his personal secretary and librarian. I accepted this honor with alacrity and in the next year and a half, I came to know this unique and unforgettable man. After I left Colombia, we corresponded actively until shortly before his death.

MIKE WILLIAMSON
Curator - Dallas Zoo
Dallas, Texas 75203-2996, U.S.A. ●

LEGISLATIVE ALERT

COMMENTS SOUGHT ON *Sternotherus m. depressus*

The U. S. Fish and Wildlife Service announced a positive finding on a petition by the Environmental Defense Fund to list the flattened musk turtle, *Sternotherus minor depressus* (or *S. depressus*) as a threatened species (F.R. 49:67:13558-59, Apr. 5, 84). The petition was received by the Service on December 1, 1983, and a decision must be reached within 12 months of that date as to whether the requested action is warranted.

The Service is now receiving comments and soliciting data concerning the turtle; it is especially interested in information regarding "taxonomy, distribution, any recommended critical habitat for the species, and threats."

Comments and information may be submitted "until further notice" to the Associate Director — Federal Assistance, U. S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240. Additional information may be obtained by contacting John L. Spinks, Jr., Chief, Office of Endangered Species, same address as above. ●

FEDERAL REGISTER NOTICES

The SSAR Conservation Committee monitors the Federal Register and excerpts items concerning the herpetological resource. The following summaries briefly highlight those issues and identify the volume and date of publication. Those individuals interested in more detail are referred to the appropriate issue of the Register.

Volume 48, No. 161, pp. 37494-37498. August 18, 1983. 50 CFR Part 23. Proposed findings and rule for Export of . . . **American Alligator** . . . Taken in 1983-84 and Subsequent Seasons. Deadline for comments was September 19, 1983.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates international trade in certain animal and plant species. This proposed rule identifies the conditions for export for legally taken American alligator *(Alligator mississippiensis)* hides taken in Florida and Louisiana for the 1983-85 harvests.

Volume 48, No. 226, pp. 52740-52743. November 22, 1983. 50 CFR Part 17. Final Rule to Remove the Florida Population of the **Pine Barrens Treefrog** from the List of Endangered and Threatened Wildlife and To Rescind Previously Determined Critical Habitat. The rule became effective on December 22, 1983.

A final rule published on November 11, 1977 (42 FR 58754-58756) determined that the Florida population of the Pine Barrens treefrog *(Hyla andersonii)* was endangered. A critical habitat designation became effective on December 8, 1977. Subsequent investigations by the Florida Game and Fresh Water Fish Commission conducted pursuant to an Endangered Species Cooperative Agreement identified many additional sites occupied by this species. A proposed rule was published on September 15, 1982 (47 FR 40673-40676); six responses were received; five favored delisting and one opposed. This final rule officially removes the Florida population of *H. andersonii* from the federal endangered species list.

Volume 49, No. 5, pp. 1058-1060. January 9, 1984. 50 CFR Part 23. Final Findings and Rule for Export of **American Alligators** Taken in 1983-85 Harvest Seasons. The findings became effective on January 9, 1984.

The rule states the final conditions under which American alligator *(Alligator mississippiensis)* hides may be exported from Florida and Louisiana. Hides from animals taken on or before December 31, 1985 must be clearly identified as to species, state of origin and season of taking and must be tagged by a permanently attached, serially numbered tag of a type approved by the Service that is attached under conditions established by the Service. A summary of this rule is also available in the Endangered Species Bulletin (Volume IX, No. 3, March, 1984).

Volume 49, No. 11, pp. 1992-1994. January 17, 1984. 50 CFR Part 17. Final rule: Determination That the **Wyoming Toad** *(Bufo hemiophrys baxteri)* Is an Endangered Species. The rule became effective on February 16, 1984.

The Wyoming toad was discovered in 1946. It is closely related to the Canadian toad *(Bufo h. hemiophrys)* but was identified as a distinct subspecies in 1968. It is believed to be a glacial relict and occurs only in a restricted area in Wyoming. Surveys in recent years have yielded but few animals. A proposed rule was published on January 27, 1983 (48 FR 3794); five comments were received, all supportive of listing the Wyoming toad as an endangered species. No critical habitat designations have been made to date.

Volume 49, No. 12, p. 2128. January 18, 1984. 50 CFR Part 23. Notice of Amendment to Appendix and Request for Comments on: Indian Snakes Added to Appendix III of

Endangered Species Convention. Deadline for comments was February 3, 1984.

The following species were submitted by the Government of the Republic of India for inclusion in Appendix III of CITES:

Family Colubridae:
Atretium schistosum (olive keelback water snake)
Cerberus rhynchops (dog-faced water snake)
Natrix piscator (checkered keelback water snake)
Pytas mucosus (Indian rat snake)

Family Elapidae:
Naja naja (Indian cobra)
Ophiophagus hannah (king cobra)

Family Viperidae:
Vipera russellii (Russell's viper)

Volume 49, No. 41, pp. 7394-7398. February 29, 1984. 50 CFR Part 17. Final rule: Listing of Two Spanish Reptiles and the Delisting of the Indian Flap-Shelled Turtle. The rule became effective on March 30, 1984.

The **Hierro giant lizard** *(Gallotia simonyi simonyi)* is determined to be endangered. It is a large herbivorous species known only in the Canary Islands. It was believed extinct until 1975, but survives on a steep rocky arid cliff. Half of the estimated 200 individuals in 1975 were juveniles. Possible threats include proposed development, competition with goats, over-collecting and gull predation on juveniles. No critical habitat has been designated.

The **Ibiza wall lizard** *(Podarcis pityusensis)* is determined to be threatened. It is found on the Balearic Islands in the Mediterranean Sea. Threats and impacts include gull predation, scientific and commercial collecting, human-mediated hybridization of the subspecies, habitat alteration and destruction, and poisoning. No critical habitat has been designated.

The **Indian flap-shelled turtle** *(Lissemys punctata punctata)* has been removed from the endangered species list. It was listed on June 14, 1976 (41 FR 24062-24067) based on recommendations from Bangladesh that it be listed on CITES Appendix I. Subsequent investigations indicate that it is one of the most common turtles in India and there is no justification for retaining it on the endangered species list. Although provisions of the Endangered Species Act do not apply after the effective date of the rule, the species still remains on the CITES Appendix I and therefore is subject to trade restrictions.

A summary of this rule may also be found in the Endangered Species Bulletin (Volume IX, No. 3, March 1984).

Volume 49, No. 41, pp. 7416-7417. February 29, 1984. 50 CFR Part 17. Notice of: Findings on a Petition to List the **Alligator Snapping Turtle** as a Threatened Species. The Findings was made on February 10, 1984.

The Service received a petition on February 23, 1983, from Dr. Peter C. H. Pritchard, to list the alligator snapping turtle *(Malaclemys temmincki)*. The species was included in the Review of Vertebrate Wildlife for Listing as Endangered or Threatened Species published in the Register on December 30, 1982. The species appears to have declined throughout most of its range, although local populations in some areas appear stable. There was both support for and opposition to listing at this time. The Service concluded by stating there are insufficient data at this time to support listing but that it will continue to monitor the status of the turtle. An additional summary of this finding may be found in the Endangered Species Bulletin (Volume IX, No. 3, March 1984).

PATRICIA RIEXINGER
New York State Department
of Environmental Conservation
Albany, New York 12233, U.S.A. ●

SOCIETIES

OREGON HERPETOLOGICAL SOCIETY REVIVED

The Oregon Herpetological Society, which originated in 1955, has recently emerged from a decade of dormancy and finds itself alive and ready for action. A newsletter was published in June 1984 and a field trip was held in the same month. Regular meetings are held on the second Sunday of each month (except July and August), beginning at 7:00 P.M., in Eugene. Membership is $5 (regular) or $4 (corresponding) annually. For further information contact:

Mr. David Olson
OHS Treasurer
981 West 8th Avenue, #10
Eugene, Oregon 97402, U.S.A. ●

MINNESOTA HERP SOCIETY RECEIVES GRANT

The Minnesota Herpetological Society has received a grant from the Minnesota Department of Natural Resources to do field work in the Missouri River Drainage in the southwestern corner of the state. The $1500 grant is to support three field trips to the area. ●

AMPHIBIA-REPTILIA AND THE "SOCIETAS EUROPAEA HERPETOLOGICA"

In 1980, *Amphibia-Reptilia*—a major new international journal of herpetology—was established in Europe, yet many of our colleagues, especially those in America, are unaware of it and fewer still have seen copies. We take an opportunity, then, to review this journal, now completing its fourth volume in 1984, to discuss its importance for world herpetology and a potential problem for its further development.

In subject matter and geographical coverage *Amphibia-Reptilia* is quite cosmopolitan. To illustrate the diversity of coverage, the articles in volume 3 (1982) can be divided into the following categories: seven on molecular and karyotypic studies; five on ecology and behavior; five on taxonomy and systematics; three on anatomy; three distributional and faunistic papers; three on reproduction; two on development; and one other paper each on genetics, evolution, physiology, conservation and paleontology. The journal emphasizes European species (23 of the 33 papers in volume 3), but nearly one-third of the articles covered species from other regions including three on Asia; three on the Americas; one each for Africa and Australia; and with two others that are world-wide in coverage. However, whatever the geographic focus, the subject matter of most articles is of general interest. There is also a section for book reviews and newsnotes at the end of each issue. The vast majority of papers is in English (in volume 3, 25 papers) but also French (5), Spanish (2) and German (1)—the four official languages of the journal. English abstracts are provided for all papers.

The journal is quarterly, although double numbers occasionally appear. The format and typography are highly professional and the photographs are of an especially high standard. To date, each volume comprises about 400 pages. In general, the quality of the articles and of the editing is very good.

One cannot fairly review *Amphibia-Reptilia* without commenting on its sponsoring society. The "Societas Europaea Herpetologica" (SEH) is the first multi-national rather than linguistic or national society to develop in Europe. Two pivotal meetings provided the real impetus for a pan-European society, both for a society and the journal. Following discussions between French and German herpetologists, a working session was held at Montpellier, 21-23 June 1979, and the formal founding session at Bonn, 10-11 September 1979. Membership, especially among professional herpetologists in Europe, grew rapidly for several years and is now about 385 (as of March 1984). Besides the journal, biennial meetings have been held (Vienna 1981; León 1983; 1985 planned for Prague, jointly with herpetologists from Eastern Europe and the USSR) and several committees established, the most active of which is that concerning conservation.

SEH founded *Amphibia-Reptilia* in a manner quite unlike that of the comparable journals based in America. In the latter societies, for better or worse, the size and format of their respective journals developed over many years in parallel to the growing financial capabilities of the sponsoring societies. For *Amphibia-Reptilia*, on the contrary, it was decided to establish a fully professional journal at the very beginning, but in order to do so the SEH had to ask a commercial firm to publish the journal, with the society guaranteeing a certain financial support. Unfortunately, their first publisher went bankrupt during 1983 but SEH has recently contracted with the well-known firm of E. J. Brill in Leiden, to publish *Amphibia-Reptilia*. All commitments to subscribers will be honored and the journal should be back on schedule by the end of

1984. We believe that *Amphibia-Reptilia* is an excellent journal and deserves a broader readership. Compared to other journals now printed in Europe it is very modestly priced. On the other hand we note that *Amphibia-Reptilia* currently addresses itself to university and museum personnel although herpetology as a discipline is much more extensive. One would hope that the editors, in further developing their journal, will broaden the journal's appeal so that *Amphibia-Reptilia* will show up in more libraries and on more desks and, as a result, enlarge the financial base for the journal which seems necessary for its survival.

We hope that our colleagues will consider membership in SEH (which includes subscription to *Amphibia-Reptilia*), at least for a trial year. Dues for individuals are presently 75 Deutschmarks and can be paid by check, in marks, to the treasurer, Dr. Heinz Wermuth, Staatliches Museum für Naturkunde, Arsenalplatz 3, D-7140 Ludwigsburg, Federal Republic of Germany. In addition, by a special new arrangement, dues can also be paid in USA dollars, by sending a check for $32 to Dr. Wermuth.

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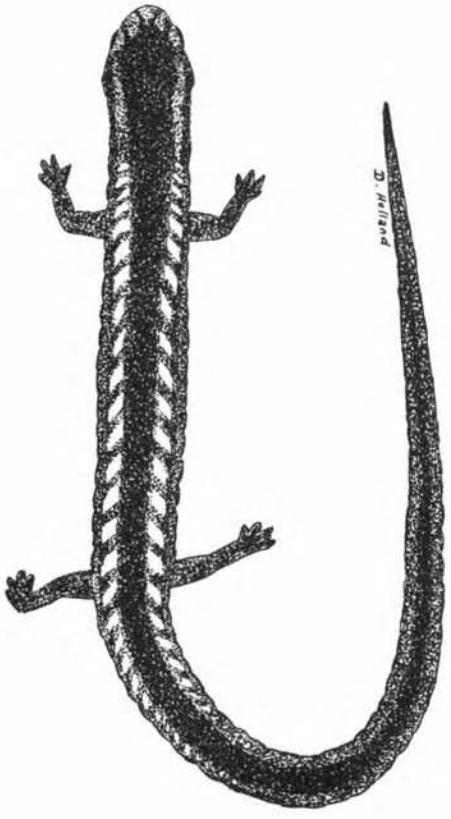

HERPETOLOGY IN AFRICA

Africa is large, and herpetologists few. Problems of distance, finance, and, not the least, politics all limit contact between us. In my capacity as Editor/Secretary of the Herpetological Association of Africa (HAA), I have been asked to attempt an 'overview' of herpetological research on the continent. Frankly my efforts are doomed. I apologise at the outset for the parochial nature of this report; it is heavily biased towards southern Africa. Not through choice, I hasten to add. It is simply where I live and work, and the area with which I am most familiar. I appeal to all herpetologists working on African reptiles and amphibians to keep me informed of their current research projects, publications and conference announcements. Through these columns I offer them an opportunity to contact, advise and inform their colleagues.

FORTHCOMING CONFERENCES

From 16-18 July 1985, the Zoological Society of Southern Africa (ZSSA) and Herpetological Association of Africa will be holding a herpetological conference, in conjunction with the ZSSA conference on "Competition and Co-existence," at the University of Natal, Pietermaritzburg. Herpetologists interested in presenting papers are invited to contact the author for further details.

Sixth Symposium on African Amphibians, Department of Biology, University of Miami, U.S.A. 13 April 1987. Organized by the African Amphibian working group, participation in the symposium will be by invitation to scientists active in the study of African amphibians. Information can be obtained from Prof. Jay M. Savage, Department of Biology, University of Miami, Coral Gables, Florida 33124, U.S.A.

PUBLICATIONS

Herpetology of Africa. A checklist and bibiography of the Orders Amphisbaenia, Sauia and Serpentes by Kenneth R. G. Welch, 1982, 293 pp, $19.50, Robert E. Krieger Publ., Malabar, Florida. This recent publication, despite its name, is restricted to African squamates, but is nonetheless a very useful checklist. Detailed, constructive reviews by Broadley and Branch appeared in J. Herpetol. Assoc. Afr., 29:22-36, 1983. A companion volume on African amphibians is in preparation.

The Transvaal Branch of the Wildlife Society of Southern Africa has printed a large colour poster illustrating all Transvaal snakes. Copies can be obtained from the Society (P.O. Box 44344, Linden, 2104, South Africa) for R3.50.

FitzSimons' *Snakes of Southern Africa*, Delta Books, Johannesburg, 376 pp, 83 maps, 209 figs., 84 col. pls., R59.65. FitzSimons' 1962 monograph has been completely revised by Dr. D. G. Broadley, and is now the definitive treatment of the subcontinent's snakes.

Die Slange van Suidwes-Afrika by P. J. and P. J. C. Buys. Gamsberg Publ., Windhoek, R7.75 (in Afrikaans).

Danie Immelman and Pietro de Lange (University of Stellenbosch) have completed M.Sc. theses on "The cranial morphology of *Phrynomerus annectans* Werner, with special reference to the systematic position of the Phrynomerinae (Microhylidae)" and "Kidney morphology in *Geochelone pardalis*," respectively.

Niel Jacobsen (Transvaal Nature Conservation Division) has completed his M.Sc. thesis (University of Pretoria) on "The ecology of the reptiles and amphibians in the *Burkea africana - Eragrostris pallens* savanna of the Nylsvley Nature Reserve" and is now completing his survey of the Province's herpetofauna.

CURRENT RESEARCH

Dr. Mike Picker (University of Cape Town) is investigating habitat selection in *Xenopus gilli* and *X. laevis*, and hybridization between the two species. *Xenopus gilli* is an endangered amphibian and Dr. Picker is a member of the Council for Cape Platanna Conservation.

'Amphibia Zambesiaca,' a study of the amphibians of Mozambique, Malawi, Zambia, Botswana, Zimbabwe, and the Caprivi Strip of Namibia, is co-authored by D. G. Broadley and J. C. Poynton. Part 1 (Scolecomorphidae, Pipidae, Hemisidae and Arthroleptidae) has recently been published (Ann. Natal Mus., 26, 1984), and Part 2 (Ranidae) is in press. Dr. Broadley is currently working on the companion monograph - 'Reptilia Zambesiaca.'

Professor Robert Capranica (Cornell University) recently completed a 4 month sabbatical, working in collaboration with Dr. Neville Passmore (University of the Witwatersrand) on mate recognition in *Kassina* and phonotaxis in *Hyperolius marmoratus*.

Jim Campbell (ex Portland State University, Oregon) has joined the Desert Ecological Research Unit in the Namib Desert to investigate body temperature regulation and digestive efficiency in *Angolosaurus skoogi* and *Aporosaura anchietae*. Physiological parameters of this investigation will be studied by Professor D. M. Mitchell, Medical School, University of the Witwatersrand.

Dr. C. W. D. Gibson (Animal Ecology Research Group, Oxford University) is continuing studies on the Aldabran giant tortoise *(Geochelone gigantea)*. Dr. Malcolm Coe, of the same department, is undertaking a survey of the Kora National Reserve, Kenya, and herpetological studies include:

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

Dr. Jim Hebrard (Department of Zoology, University of Nairobi) is studying the ecology and distribution of chamaeleons in Kenya.

NEWS

Wulf Haacke, Curator of Lower Vertebrates, Transvaal Museum, Pretoria, has won the recent Wildlife Society of Southern Africa/ Agfa Photographic competition (with a shot of an elephant!). His prize - a trip for 2 to the Galapagos!

RECENT AFRICAN HERPETOLOGICAL LITERATURE

This bibliography is published in the *Journal of the Herpetological Association of Africa*. The world literature is scanned for relevant publications. The Editor (Port Elizabeth Museum, P.O. Box 13147, Humewood 6013, South Africa) invites authors working on African Herpetology to inform him of their publications for inclusion in the bibliography.

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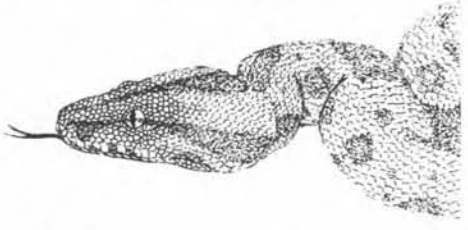

THE STATUS OF *Micrurus ruatanus* (GÜNTHER), A CORAL SNAKE ENDEMIC TO THE BAY ISLANDS OF HONDURAS

Roze (1982) recently provided a systematic and biological summary of the members of the genus *Micrurus*. In this work, Roze modified the status of a number of taxa within the genus. One of these changes involved placing the nominal species *Micrurus ruatanus* (Günther), 1895, as a subspecies within *M. nigrocinctus*, a widespread Middle American species, occurring also in adjacent Colombia. The reasoning given for this shift was as follows: "Whereas no intergradation is known (Wilson and Meyer, 1972), apparently, this subspecies is related to *M. nigrocinctus*. Some specimens of *M. n. divaricatus* from Honduras (*sic*) mainland approach the high number of black bands found in the population of Isla Roatan (*sic*)." He went on to say "is *ruatanus* already a species or not (*sic*) is an open question due to its insular distribution."

Micrurus ruatanus has been discussed several times by my coworkers and myself (Wilson and Meyer, 1972; Wilson and Hahn, 1973; Wilson and Meyer, 1982). These authors considered this coral snake to be a distinct species. I would like to reaffirm this earlier position and provide the justification below.

Roze (1982) credited Wilson and Meyer (1972) with pointing out that "no intergradation is known" between *ruatanus* and the mainland members of the *nigrocinctus* complex. These authors made no such statement, inasmuch as it is obvious that an insular form is not going to intergrade with a mainland taxon. He further stated that "apparently, this subspecies *ruatanus* is related to *M. nigrocinctus*" but provided no justification for the statement, except to note the approach in "some specimens of *M. n. divaricatus* from the Honduran mainland" in high black band count to that of *M. ruatanus*.

Wilson and Meyer (1972) pointed out that Roze, in an earlier paper (1967), had misidentified a specimen of *M. nigrocinctus* from the department of Atlántida in northern Honduras as *M. ruatanus*. In spite of the statement by Wilson and Meyer (1972) that the resemblance between the mainland specimen (TCWC 21181) and insular *ruatanus* in black body band count "is only superficial," Roze (1982), apparently, used the same specimen to support his statement that "some" specimens of mainland *nigrocinctus* have black body band counts that "approach"the high numbers seen in *ruatanus*.

It seems worthwhile to again examine the data presented by Wilson and Meyer (1972, 1982) and Wilson and Hahn (1973) in a somewhat different light in order to defend the opinion that *Micrurus ruatanus* is a distinct species.

Wilson and Meyer (1972) examined variation in *M. nigrocinctus* in Honduras in detail and concluded that recognition of subspecies in Honduras is unwarranted. They pointed out, however, that "specimens from northern Honduras generally are bicolor and have a *low number of black body bands* (italics mine) and ventrals and a long pale head band." The italicized portion of the above-quoted remarks calls into question Roze's (1982) remark about high black body bands in "some" northern species. This comment ignores much of what Wilson and Meyer (1972) had to say, i. e., that the northern bicolor populations exhibit a morphocline in the amount of deposition of black pigment on the red body bands extending from a condition where such pigment is absent or restricted to a few scattered scales through five intermediate stages to one in which the black pigment on the red bands has coalesced into a band indistinguishable from the other black body bands (i. e., the condition exhibited by TCWC 21181). Thus is explained the purported but spurious "approach" toward the condition of high black body band counts in "some" specimens from northern Honduras. Other specimens from the remainder of the country have black body band counts ranging from 11-24, $\bar{X}$ = 17.4, (the figure of 27 given for a male specimen, LSUMZ 21773, from population D in Wilson and Meyer, 1972, is incorrect; the correct count is 14; the number 27 was inadvertently obtained by adding the number of pairs of black blotches in the red band area, Fig. 5A in that paper). That range does not closely approach the counts for *M. ruatanus*.

Micrurus ruatanus was discussed and described by Wilson and Hahn (1973) and Wilson and Meyer (1982). These authors pointed out the high numbers of black body bands, ranging from 33 to 45 ($\bar{X}$ = 38.9). There is no overlap in the ranges of black body band counts between *M. ruatanus* and *M. nigrocinctus*, even counting the "double-banded" TCWC 21181. The means are separated by approximately *22* scales! There is also a noteworthy distinction in the *nature* of the banding. In the northern Honduran mainland populations of *M. nigrocinctus*, the accretion of black pigment in the red body bands acts to produce rounded blotches which, in one specimen, have coalesced into complete bands. In *M. ruatanus*, however, the black bands in some specimens are of two types, viz., longer complete bands and narrower disrupted bands that alternate with one another, most conspicuously on the posterior portion of the body (Wilson and Hahn, 1973). Ventral numbers also range lower in *ruatanus* than in *nigrocinctus* from Honduras (Wilson and Meyer, 1972). Male *ruatanus* have 183-185 ventrals; males of *nigrocinctus* from Honduras have 190-208. Females of *ruatanus* have 193-203 ventrals; female *nigrocinctus* from Honduras have 206-224. *Micrurus ruatanus* is, finally, a smaller coral snake than *M. nigrocinctus* from Honduras, especially those from the north coast. The largest known *ruatanus* (LSUMZ 22341) is a female with a total length of 681 mm; the largest *nigrocinctus* (MCZ 33342) from Honduras is 1194 mm in total length (not 1076 mm, as indicated by Wilson and Meyer, 1982). The latter specimen is from Lancetilla on the northern coastal plain.

It is evident that *Micrurus ruatanus* is a coral snake differing conspicuously from *M. nigrocinctus* in having a higher, non-overlapping black body band count, a distinct color pattern morphocline, lower ventral numbers, and a smaller body size. On the basis of the distinctiveness of these features, it is my opinion that *Micrurus ruatanus* deserves specific status.

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OBSERVATIONS OF THE FEEDING HABITS OF THE SHORT-TAILED SNAKE, *Stilosoma extenuatum* IN CAPTIVITY

Knowledge of the natural history of the short-tailed snake, *Stilosoma extenuatum*, is limited. It is certainly one of the least studied serpents in North America. Carr (1934) noted this species' power of constriction and remarkable muscular control and placed *Stilosoma* on par with kingsnakes as a constrictor and ophiophage. Ditmars (1939) reported that two captive *Stilosoma* killed and ate small brown snakes *(Storeria)* by constriction but refused small lizards. Allen and Neill (1953) reported short-tailed snakes kill prey by constriction and prey upon lizards and other unspecified snakes. Other than these few reports, the ecology of the short-tailed snake is unknown. Here I report on the results of 39 feeding trials with a single individual.

MATERIALS AND METHODS

An adult male with a snout-vent length of 540 mm was collected in Hillsborough County, Florida, on 21 February 1983. The snake was maintained in a 50 l aquarium in about 2 cm of local sand. Room temperature

ranged from 17 to 23° C. Water and refuge were always available. The feeding habits of this snake were closely monitored while offering it nine different prey species over a seven month period. Prey were offered to the *Stilosoma* every 8-12 days between 1000 and 1500 h and continuously observed for 60 min. If the *Stilosoma* did not attack or pursue the prey in that hour the prey was allowed to remain for 24 hours. If at the end of the 24 hour period the first prey species was still alive, it was replaced by a Florida crowned snake, *Tantilla relicta*. Again, I watched the snake closely for 1 hour. If the *Stilosoma* did not attempt to follow or inspect (tongue flick) any offered prey species during the first 30 minutes of observation, I carefully restrained the prey with forceps and allowed the *Stilosoma* an opportunity to examine the prey as I held it about 5 cm away. Continued lack of interest would result in that prey remaining in the snake cage for 24 hours. If the *Stilosoma* became interested in the prey I would release it near the snake. Prey species are listed in Table 1.

RESULTS

Ten of 16 successful feeding bouts are summarized in Table 2; six prey were ingested at night and not witnessed. Two additional bouts were observed but the prey ultimately escaped. Only *Tantilla relicta* was ingested by the *Stilosoma*. On several occasions the short-tailed snake showed interest in, but never attacked, other prey species, mostly snakes.

Generally the *Stilosoma* would begin a feeding bout with a *Tantilla* by directing and increasing the rate of tongue flicks. Nine of twelve attacks occurred as the *Tantilla* moved past the *Stilosoma*. The *Stilosoma* trailed the *Tantilla* in the remaining three. The position of the first bite and the method of killing (ingestion or constriction) influenced the total handling time. If the first bite was within 10 mm of the head, ingestion would begin in about 20 min. whereas a more posterior bite would considerably increase the (pre-ingestion) handling time.

Constriction was used to restrain a *Tantilla* on 4 occasions. The first is reported as feeding bout 2 in Table 2; two others were unsuccessful attempts at predation that lasted in excess of 120 minutes. During the 9th observed feeding bout (Table 2) constriction was used to hold the *Tantilla* for 30 min, but eventually the body hold on the prey was released and the *Tantilla* was restrained by the bite until ingested.

DISCUSSION

My observations, like those of Ditmars (1939), suggest that *Stilosoma extenuatum* is strictly ophiophagous specializing on Florida crowned snakes. It does not seem to be interested in lizards (contrary to Allen and Neill 1953) including those sand-swimming lizard species that are specialized for syntopic existence in the Florida sandhills.

Killing by constriction appears very costly in terms of time and energy when compared to ingestion of live prey. Carr (1934) watched an adult male take two hours and fifteen minutes to kill and eat a *Tantilla*. My three observations of *Stilosoma* attempting to kill a prey snake by constriction all extended beyond 2 hours and two of the bouts terminated as the *Tantilla* escaped.

When constricting a *Tantilla* the *Stilosoma* would use the anterior third of its body to wrap three coils around the prey and then proceed to stretch the *Tantilla* between the coils and its more anterior bite. From this posture the *Stilosoma* would "walk" its bite anteriorly on the *Tantilla* as it pulled the posterior portion of the prey in the opposite direction, appearing to injure the prey snake. The actual form of the constriction behavior was very similar to what Greene and Burghardt (1978) termed the boid pattern of constriction. The *Stilosoma* would seize the prey and with an initial twist in the first loop, turn about its long axis as it applied the loops to form a horizontal coil. Thus, the coil was applied with the anterior portion of the predator's body in such a way that the *Stilosoma's* venter faced its head. However, as a precautionary note, Greene and Burghardt (1978) found intergeneric, intraspecific and individual variability in coil application movements within the colubrid snakes.

A statement about the evolutionary implications of a relatively small reptile (with a limited size range of prey) becoming such a highly specialized predator seems in order. According to Smith (1982) *Tantilla relicta* feeds almost exclusively on Tenebrionidae larvae (89.6% of 270 prey from 124 stomachs). Tenebrionids and *Tantilla relicta* are exceedingly abundant in the patchy sandhills of central Florida. Mushinsky (unpubl. data) used pit-fall traps to collect over 150 *Tantilla relicta* (in 12 mo) on approximately 20 ha. of sandhill habitat. A logical conclusion regarding this food chain is that it reflects a long-term stability that has allowed natural selection to produce these highly stenophagic snakes. It is, however, paradoxical that we find such a well defined trophic relationship in a habitat that is itself dependent upon fire and other disturbances for its own survival. Campbell and Christman (1982) stated that the reptile community occurring in the sandhills of Florida does not actually respond to a particular plant association but rather to the physical structure of the habitat (i.e. dry, well-drained with patches of open sand). Additional field studies of this rapidly disappearing sandhill community are necessary before we can make any definitive statements regarding trophic relationships.

Table 1. Prey species (and number) offered to adult male *Stilosoma extenuatum*.

1. *Anolis carolinensis* (1)
2. *Scincella lateralis* (3)
3. *Eumeces inexpectatus* (3)
4. *Eumeces egregius* (2)
5. *Neoseps reynoldsi* (3)
6. *Diadophis punctatus* (3)
7. *Cemophora coccinea* (2)
8. *Rhadinaea flavilata* (2)
9. *Tantilla relicta* (21)

Table 2. Observations of *Stilosoma extenuatum* feeding on *Tantilla relicta*.

Trial No.	Snout-vent length of *Tantilla* (mm)	Latency to attack (sec)	Position of first bite behind head (mm)	Number of bites	Time to bite head (min)	Time to ingest (min)	Total handling time (min)	Method of Killing
1	165	240	75	3	32	14	46	Ingestion
2	160	350	30	1	214*	26	240*	Constriction
3	120	60	45	4	30	14	44	Ingestion
4	170	60	10	1	18	27	45	Ingestion
5	165	600	5	1	22	14	36	Ingestion
6	215	10	5	1	1	18	19	Ingestion
7	175	35	10	1	21	27	48	Ingestion
8	165	15	15	1	33	6	39	Ingestion
9	160	45	30	2	64	12	76	Ingestion
10	135	70	35	2	30	21	51	Ingestion
$\bar{X}$	163	148.5	26	1.7	27.8	17.9	44.8	

*not included in column average

ACKNOWLEDGMENTS

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DISEASE STUDIES AID KEMP'S RIDLEY SEA TURTLE HEADSTART RESEARCH

Since 1977, the Southeast Fisheries Center's Galveston Laboratory, (NOAA National Marine Fisheries Service) has been conducting sea turtle headstart research. Kemp's (Atlantic) ridley sea turtles *(Lepidochelys kempi),* designated an endangered species by the U.S. Endangered Species Act of 1973, are raised in captivity during their first year of life and then are tagged and released at sea in hopes that they will continue their growth to adulthood. Analysis of the results of this project will assist to determine if headstarting can augment the natural nesting populations of the Kemp's ridley (Klima and McVey 1982).

In nature, Kemp's ridley hatchlings are highly vulnerable to mortality, primarily through predation. Turtle biologists have estimated that less than 5 percent of these hatchlings survive through their first year. With headstart techniques, about 68 to 95 percent survival has been achieved with captive turtles during this critical first year.

Kemp's ridley hatchlings are supplied to the Galveston Laboratory through the cooperative efforts of the Instituto Nacional de Pesca, Mexico, the U.S. Fish and Wildlife Service, and the U.S. National Park Service. They are reared for 7 to 12 months and those in good condition are tagged and released off Padre Island, Texas (earlier release sites included the west coast of Florida) (J. P. McVey and R. S. Wheeler, pers. comm. 1978-1981). Also, approximately 86 headstarted yearlings of the 1978 and 1979 year-classes have been distributed to Miami Seaquarium in Miami, Florida, and Sea Arama Marine World in Galveston, Texas, to provide a potential captive brood stock (R. S. Wheeler, pers. comm. 1981). Of these turtles, 8 are still surviving at Miami, and 10 at Galveston (F. H. Berry and R. M. Harris, pers. comm. 1983).

At the beginning, loggerhead *(Caretta caretta)* hatchlings rather than Kemp's ridley hatchlings were reared so that the Galveston staff could gain experience for future application to the endangered ridleys. In September 1977, 1,160 loggerhead hatchlings, obtained soon after hatching from eggs collected by the Florida State Department of Natural Resources, Jensen Beach, Florida, were shipped to the Galveston Laboratory. These hatchlings were reared communally in large close-ended concrete tanks (raceways), containing recycled natural seawater, and originally designed for shrimp culture (C. R. Mock and C. T. Fontaine, pers. comm. 1977). Later, many culture methods were developed and used, including flow-through tanks in which the seawater was constantly and gradually exchanged through a supply valve and a drainage outlet (A. Brown, Jr. and R. S. Wheeler, pers. comm. 1977). The animals were fed mainly a frozen fish diet.

The decision to experiment first with the loggerheads proved to be quite beneficial. Although there was only a 9 percent loggerhead survival, by the end of the 10-month rearing period the staff had learned much about turtle diseases and their prevention and treatment. Almost 100 percent of the loggerhead hatchlings became ill at one time or another and many died. The most serious kind of death (about 40 percent) involved a "sudden hatchling death" (SHD) syndrome in which the animals suddenly died without any discernible cause. Other commonly occurring diseases were skin and shell lesions, eyelid infection, emaciation, bowel obstruction, and anal infection (Leong 1979). Mortality due to SHD rapidly dropped from a peak of about 4 percent to about 0.2 to 0.3 percent per day when the turtles were transferred from the closed raceways to flow-through tanks. However, the other diseases appeared one after another.

Laboratory work indicated that the primary requirements for disease treatment and control were clean water and individual isolation of sick turtles. Both requirements were met by holding individual sick animals in plastic 10-liter buckets containing seawater, which was changed daily. When necessary, therapeutic drugs or antibiotics were administered topically, by intraesophageal intubation or by subcutaneous injection. The development of isolation techniques and chemotherapy led to the recovery of many sick turtles. A successful therapeutic treatment involved the use of static formalin bath in conjunction with injections of an antibiotic such as ampicillin or chloramphenicol.

During July and August 1978, the first shipment of 3,081 Kemp's ridley hatchlings was received at the Galveston Laboratory. The turtles were reared together in large, communal, fiberglass raceways. Water was changed completely three times weekly. The turtles were fed a commercial pelletized feed.

Every turtle contracted diseases or infections of one kind or another. Some illnesses were similar to those we had experienced with the loggerheads, but there were also many new diseases. In addition, the ridley hatchlings were extremely aggressive, and soon after being placed in the raceways most suffered injuries caused by either biting or scratching each other. Such aggressive behavior was not observed in the loggerheads.

Most of the diseases and injuries in the 1978 year-class of ridleys were successfully controlled through isolation and treatment techniques as previously established for loggerheads. However, the maladies recurred after the ridleys were returned to the communal raceways. Experiments showed that biting and wounding could be eliminated and turtle disease vastly reduced by isolating each hatchling in individual containers within the raceways. Therefore, in subsequent rearing practices, individual turtles were isolated in perforated buckets suspended in the raceways. Survival rate for the 1978 year-class was 68 percent.

Bowel compaction was common among the hatchlings of the 1977 and 1978 year-classes. In attempts to develop a diagnostic tool for this condition, a cooperative effort was launched (with Dr. G. L. McLellan) to explore the use of x-ray technology. Tests showed that the barium-fluoroscopic method, normally used on humans with gastrointestinal problems, produced good quality x-ray films of the gastrointestinal tracts of healthy hatchlings (McLellan and Leong 1981). This result indicated that x-radiography was potentially useful for diagnosing intestinal obstructions in sea turtle hatchlings.

Kidney infection was another malady requiring internal diagnosis. We tried, unsuccessfully, to develop radiological diagnostic techniques, using radio-opaque material. We learned from this trial, however, that subcutaneous injections of a radio-opaque material, sodium diatrizoate, administered to the neck region, were absorbed much faster than those administered to the suprafemoral pouch (referred to as "hind limb" in McLellan and Leong 1982), as was the general practice in parenteral administration of drugs for disease treatment in turtle hatchlings. This finding suggested that injection of drugs into the neck area for disease treatment was probably more effective than injection into the suprafemoral pouch (McLellan and Leong 1982).

In 1979 and 1980, prevention and treatment of diseases in ridleys contributed to survival rates of 83 and 95%, respectively. During this time, however, an outbreak of a bloating syndrome affected more than 300 ridley hatchlings, killing about 150 of them. Autopsies revealed that the animals had duodenal ulcerations. Follow-up clinical observations and feeding experiments showed that a modification of feeding regimens, either by reducing the amount and frequency of feeding from 4 times to 2 times per day or less, or by replacing the manufactured turtle feed with a ground fish diet, were successful in stopping the spread of the bloating, and led to the recovery of the sick turtles.

The 1,865 ridley hatchlings received in 1981 did not fare nearly as well as the 1980 year class. From the outset, the 1981 year-class was plagued with at least two kinds of fungal infections. The first type surfaced in August 1981 shortly after the hatchlings arrived at the Galveston Laboratory. Autopsies revealed a hardened yolk sac, heavily infested with fungal spores and mycelia. Three different fungi were isolated in laboratory cultures. One, *Paecilomyces* sp., was suspected to be a pathogen. More studies will be needed to confirm the pathogenicity of the isolated fungi. In slightly older hatchlings, a similar type of fungal infection, also apparently associated with *Paecilomyces*, was found in the liver, lung, muscle, and brain. To date, there has been no effective treatment for the *Paecilomyces* type infection, but circumstantial evidence suggested that sunlight could be helpful in curing head lesions infected by the fungus. Generally, infected hatchlings show few external signs or symptoms that can be used for early diagnosis, although in advanced stages of the disease, sick turtles are emaciated and stunted in growth.

Another type of mycotic infection in the 1981 year-class involved the fungus *Scolecobasidium constrictum.* The primary site of infection was in lung tissue, but the fungus was also observed to damage bone tissue. The disease usually did not become apparent until the affected turtles were 6 to 7 months old. So far, we have not found a cure. By providing the sick animals with a clean and warm environment during clinical isolation, however, we have been able to obtain spon-

taneous recovery in some cases. In June 1982, the survival rate of the 1981 year-class prior to release was 79%.

We have not determined whether the diseases occurring in captive sea turtles also occur in the wild, or if they are peculiar to the conditions of rearing sea turtles at the Galveston Laboratory. Nevertheless, it is clear that successful disease prevention and treatment have contributed greatly to the high survival rates experienced with these animals in captivity during their first year of life. Such success has led to the release of larger numbers of healthy, yearling Kemp's ridley sea turtles, which we hope will contribute significantly in the years ahead toward the conservation of the species. The Galveston Laboratory has continued with sea turtle pathology research to try to improve techniques and methods for diagnosis, prevention, and treatment for diseases and injuries in sea turtles.

ACKNOWLEDGMENTS

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THE ESTABLISHMENT OF *Podarcis muralis* IN CINCINNATI, OHIO

Several species of European animals have been purposely and accidentally released in the United States. Among the earliest planned introductions were those that occurred during the years 1872-1874, when 4000 individuals of 20 European birds were imported to Ohio for release in Cincinnati (Langdon 1881). This attempt by the Acclimatization Society of Cincinnati to increase the number of Ohio songbirds ended in total failure. Not even the European starling, *Sturnus vulgaris*, survived, although the species later spread through most of the United States following its successful 1890 and 1891 introductions in New York City (Long 1981).

Exact dates of accidental introductions are more difficult to determine. For example, the European lizard colonies *(Podarcis sicula* and *Lacerta viridis)* in Topeka, Kansas, were probably established in the 1950s from specimens that escaped from an animal dealer (Collins 1982). Conant (1945) reported the occasional appearance of various European lizards on the piers and grounds of a cork import company in Gloucester, New Jersey. While none of the four observed species succeeded in establishing themselves in Gloucester, one of them, *Podarcis muralis*, did succeed when it was deliberately introduced in Cincinnati.

In September 1951, following a family visit to Europe, a Cincinnati resident brought two European wall lizards, *P. muralis*, to the United States. The animals had been caught in the Lake Como area of northern Italy, and were released in the backyard of the resident's Cincinnati home. The *P. muralis* population has since spread throughout much of southeastern Cincinnati. The purpose of this note is to outline the possible reasons for the success of this European wall lizard transplantation.

Hundreds of European plant and animal species have been established in North America, but relatively few have invaded native habitats. The vast majority occupy cultivated and urban areas, new habitats that humans introduced to North America (Elton 1958; MacArthur 1972). Indigenous American species did not have time to colonize these manmade habitats before the arrival of such immigrants as chicory, *Cichorium intybus*, dandelion, *Taraxacum officinale*, cabbage butterfly, *Artogeia rapae*, Norway rat, *Rattus norvegicus*, and starling, *S. vulgaris*. These species succeeded in their new American environments because they were already adapted to living alongside humans in towns and fields of Europe.

The wall lizard, *P. muralis*, is a good example of an animal that lives in association with human habitations in Europe. It seems likely that *P. muralis* evolved in dry, rocky regions and that it spread into many of the areas it now occupies subsequent to human agricultural and construction activities. In Europe, I have observed wall lizards on stone walls, sides of houses, piles of rocks, and railway embankments. According to Arnold and Burton (1978), *P. muralis* is the most urban Lacertid in Europe.

The two wall lizards transplanted to Cincinnati in 1951 (not 1948 as reported by Vigle 1977) were released on a stone wall. Their descendents have since spread to limestone rock outcrops and all of the same urban habitats as those listed above in Europe. The wall lizard's ability to adapt to the Cincinnati environment is largely due to pre-adaptation in its original range.

In addition to suitable habitat, lack of competition is another obvious criterion for the success of imported species. *P. muralis* has not had to compete with native lizards in its present 6 km² Cincinnati range. The eastern fence lizard, *Sceloporus undulatus*, five-lined skink, *Eumeces fasciatus*, and broad-headed skink, *E. laticeps*, occur in the Cincinnati region (Conant 1951), but none of these species inhabit the area that has been colonized by *P. muralis* since 1951.

Another European species, the starling, *S. vulgaris*, is also found throughout the area now occupied by *P. muralis*. Like the wall lizard, the immigrant starling is pre-adapted to an urban habitat and meets with little competition from native animals (Forbush 1920). But unlike the wall lizard introduction, the deliberate transplantation of foreign-born starlings to Cincinnati was unsuccessful, possibly due to climatic differences between the starlings' native localities and Cincinnati (Roots 1976).

Unlike the initially unsuccessful starlings, the wall lizards from Italy's Lake Como region were probably better pre-adapted to Cincinnati's climate. Similar temperature and precipitation patterns occur in Cincinnati and Milan, the meteorological station nearest Lake Como, 40 km distant (Fig. 1). The average monthly temperature is 13.3 ° C in Cincinnati and 12.8 ° C in Milan. The average-monthly precipitation is 82 mm in Cincinnati

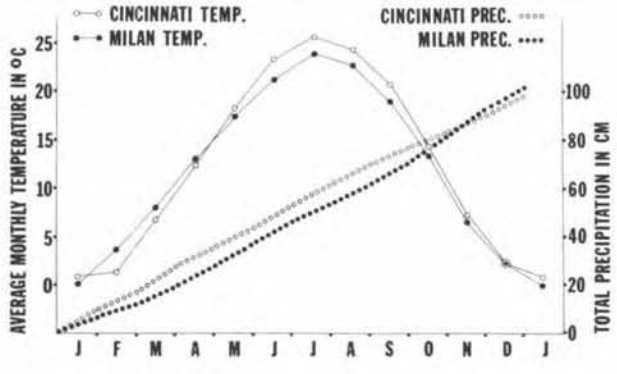

Figure 1. Temperature and moisture patterns of Cincinnati, Ohio and Milan, Italy (data from Miller 1961).

and 84 mm in Milan (Miller 1961). The similarities of climate and habitat between the European place of origin and the American site of introduction are probably the major factors that allow *P. muralis* to survive in Cincinnati.

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TECHNIQUES

A MODIFIED SEINING TECHNIQUE FOR SINGLE PERSON SAMPLING OF DEEP OR COLD WATER

Seining is the most successful and widely used method of sampling small bodies of water for aquatic vertebrates. Two drawbacks of seining are 1) two people are required to operate the seine, and 2) the operators must enter the water, making cold or deep water difficult to sample thoroughly. In order to conduct a study of *Ambystoma tigrinum*, a salamander found in ponds which are sometimes too deep or cold for ordinary seining methods, I developed the technique described below.

An ordinary seine is modified as shown in Figure 1A and 1C. Eye bolts are attached to each brail by drilling holes through the pole near the lead-line end, threading the bolts through, and attaching hexagonal nuts to secure the bolts. Flat washers should be used to protect the brail and lock washers will prevent accidental loosening with use. Figure 1B depicts an alternative method of brail modification. A weight (e.g. 2.8 kg of lead shot in a sturdy canvas bag) is attached to the bottom eyebolt of each brail. The weights serve to submerge the seine, therefore their heaviness will vary with the size of the brails and the buoyancy of the float line. A separate tow rope is connected to each brail by the eyebolts at a particular level. Attachment of weights and tow ropes can be done with sturdy metal clips to facilitate their repeated removal, since it is easier to carry the seine and equipment separately.

After the weights and tow ropes are attached, the seine can be used in two ways. If two people are available, each person can tow one rope with the seine extended between them. If the ropes are long enough a pond can be straddled and the samplers need not enter the water. I have successfully used this method (with two 30 m ropes) to seine Nebraska cattle ponds, since these bodies of water usually lack trees and other shoreline impediments.

When portions of the shoreline are obstructed or only one person is available, the following alternative method can be used: The seine is stretched along one shore parallel to the opposite side. Tow ropes are extended across the pond by carrying them around or by tying a strong lightweight cord to the rope, throwing the cord across the pond by means of an attached weight, and pulling the rope across with the cord. (The latter is helpful when tall vegetation is found near the shore). On the opposite shore each rope is inserted through one of two metal loops which have been screwed into the ground a seine-width apart. Dog-leash tie-outs, which can be purchased at most pet stores, work best. These loops serve to hold the ropes apart and close to the ground, keeping the seine extended and helping to prevent "hopping" (repeated lifting of the lead line off the bottom). The operator can then tow the seine across the pond by pulling the ropes

simultaneously, either hand over hand or by holding on and walking away. I am approximately 1.8 m tall and weigh 79.5 kg, and have been easily able to tow a 10 m by 2 m bag seine of 1 cm by 1 cm mesh. On occasions when the seine has become caught on underwater obstacles, releasing one rope and pulling on the other has never failed to free the net.

I have found that this method is most successful with bag seines. The brails tend to lean backward as they are being pulled and the bag captures organisms that would be washed over the float line of a normal seine. This problem can be alleviated by towing normal seines more slowly, by attaching the tow ropes at a higher level, or by firmly attaching styrofoam floats to the tops of the brails.

The above seining modifications are especially useful for sampling small ponds which are normally too deep and/or cold to enter. For example, in order to capture reproductive *Ambystoma tigrinum* (which are explosive breeders in late winter) it has previously been necessary to surround entire ponds with drift fence, which requires time-consuming maintenance and frequent nighttime surveillance. Seining allows the frequent sampling of numerous winter ponds without debilitating immersion. In addition, I have been able to collect fish, neotenic salamander larvae, and overwintering frogs from ponds deeper than 7 m. I doubt that this technique will be useful on any but the most sluggish of lotic waters, and I have only attempted to use it on ponds, stream backwaters, and dammed creeks. However, biologists working in the latter environments may be able to use this modified seining method to increase their sampling productivity.

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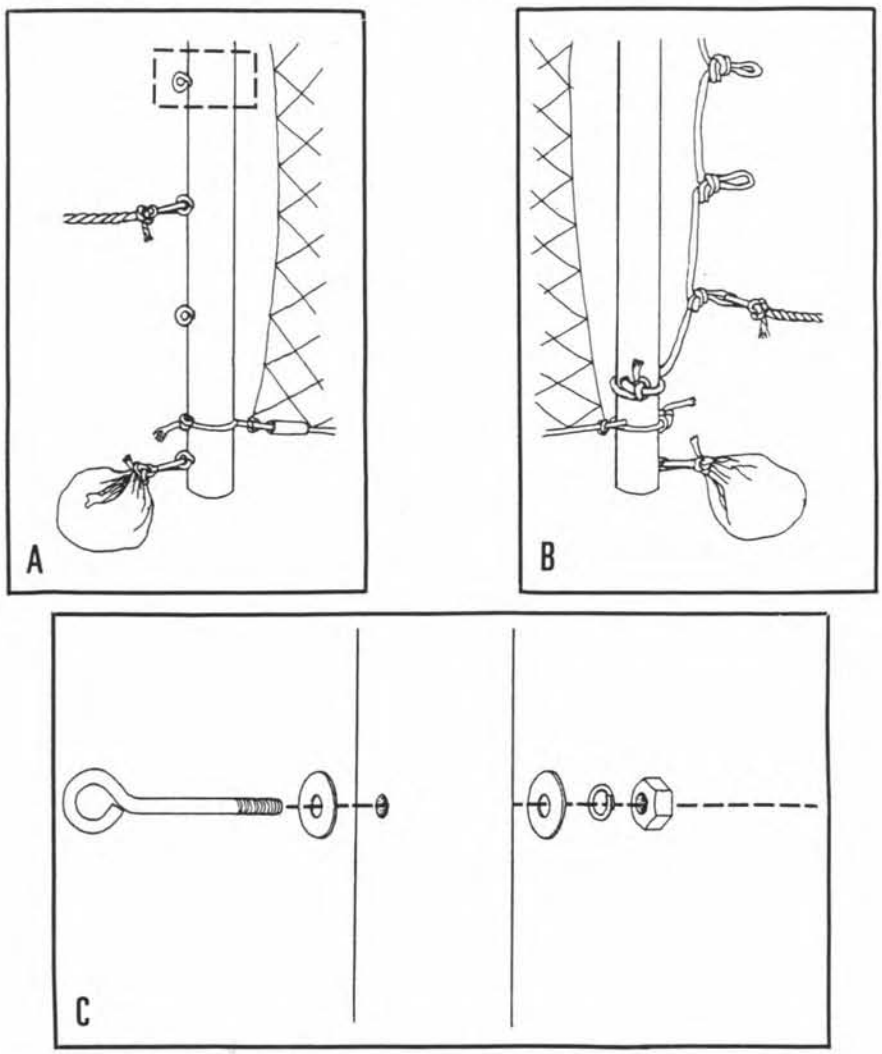

Figure 1. Diagrammatic representation of brail modifications for seine towing. A) Brail with eye bolts. B) Brail with knotted rope replacing eye bolts. C) Exploded view of eye bolt attachment. See text for details.

A TAGGING METHOD FOR USE IN HATCHLING TURTLES

It is important in laboratory studies of behavior and growth of hatchling turtles to be able to identify individuals (reviewed by Plummer 1979). Toe clipping and scute notching (Cagle 1939), marking with waterproof pens (Sarnat and McNabb 1981), lacquered ink (Miller 1955), and insertion of plastic buttons (Pough 1970) have all been used with success. However, in turtles with dark shells, the marking pen and similar techniques are not effective. The scute notching and toe-clip techniques require handling the animals to obtain a positive identification, and if not applied properly, the shell notching may either heal over completely or seriously deform the animal as it grows (Cagle 1939). The use of "Buttoneer" tags (Pough 1970) may not be possible in hatchling turtles until the posterior marginal portions of the carapace are ossified and the animal can withstand a hole being drilled into its carapace. Here we describe a simple method of marking hatchling turtles using plastic beads tied through pierced posterior carapacial scutes, which allows individual identification without handling. This technique is similar in some ways to those devised for marking individual amphibians (Nace and Manders 1982) and reptiles (Pough 1970).

METHODS

Each tag consisted of a pair of colored plastic beads tied together through a pierced posterior marginal carapacial scute. Color combinations were selected for individual identification. The tags were prepared beforehand by tying one of the plastic beads (approximately 2.5 mm in diameter, 1.5 mm in thickness) securely with a reef knot onto the middle of a piece of monofilament nylon or polyester thread at least 15 cm in length. In the present study, two regimes of tagging were implemented. Seventy-five hatchling snapping turtles *(Chelydra serpentina)* were tagged in the initial study by tying the monofilament threads with a reef knot. A subset of 61 turtles was blotted dry on paper towelling and weighed, tagged, and immediately reweighed. In a second experiment, 26 turtles were tagged. Sixteen tags were tied and then the knot was melted with a fine soldering pencil; the remaining 10 turtles' tags were tied, but the knot was not melted.

The turtles were placed into cold torpor prior to tagging. The dorsal and ventral posterior margins of the carapace were swabbed with alcohol. A posterior marginal scute was selected and pierced from below with a short, fine-gauge hypodermic needle. The free ends of the tag threads were passed through the needle, from the point side, while it was still protruding through the shell. The needle was then withdrawn, leaving the threads through the carapace, hanging free on the underside. The threads were gently pulled to bring the upper bead against the carapace, and the lower bead was then threaded and tied. The trailing ends of the threads were trimmed to within 4 mm of the knot. If trimmed more closely, the tag tended to become untied after awhile.

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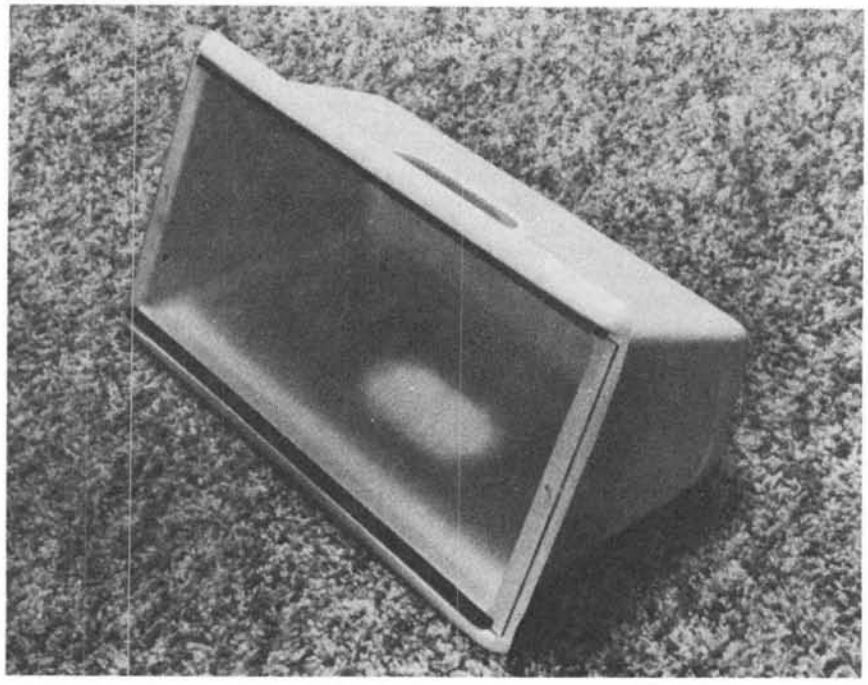

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RESULTS AND DISCUSSION

Most turtles tagged in this fashion ignored the tag completely, but some pushed against the lower bead with the nearest hind foot, and some snapped at tags on others, especially brighter tags in warm colors. It did not appear that the tagging techniques caused any mortality among the hatchlings, although this was not controlled for. The turtles weighed significantly less after tagging (prior to tagging, $\bar{X} = 7.09 \pm 1.84$ g; after tagging, $\bar{X} = 6.85 \pm 1.67$ g; paired $t = 13.28$, $P < 0.0005$, $n = 61$). The tags themselves weighed very little ($\bar{X} = 0.02785 \pm 0.00701$ g; $n = 20$), and the difference in hatchling weights before and after tagging was attributed to water lost during handling. The turtles in the first study (monofilament thread not fused) were maintained at 26° C for 69 days. During this time, 14 hatchlings died, and 17 lost tags at least once. Tags were lost in two ways: either the knots untied or the tag broke through the remaining portion of the scute. On average, 2.5% of surviving turtles lost tags each week. Five hatchlings were observed beyond 10 weeks and none of these lost the bead tags over the next 10 months.

Animals in the second study were maintained at room temperature for 7 weeks. During this period, two of the 26 turtles died, one of the 10 tied-only animals lost its tag (10%), and two of the 16 fused-knot tags were lost (12.5%). Occasionally the threads would be cut by the soldering pencil while tagging, and the whole process had to be repeated (five of 16 tags). Therefore, although the two techniques had very similar loss rates during this brief study, the problems with tagging caused by trying to melt the threads without burning the animal or cutting the threads would suggest that tying alone is sufficient.

This technique facilitates positive identification of individual turtles without handling, as long as both beads can be seen. The relatively high tag-loss rate (2.5% per week), as compared to similar techniques (Nace and Manders 1982) may be attributed to the incompletely ossified posterior carapace in hatchling turtles. The use of a wire implant through a bone such as a humerus or femur (Nace and Manders 1982), although perhaps less likely to be lost than a threaded tag, may cause serious injury to an animal less capable of regeneration than an amphibian. It is not known if the present technique could be used in a field-marking situation, but it is possible that if the beads were tied on with enough slack, growth to adult size could be accommodated.

ACKNOWLEDGMENTS

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PAINT-MARKING THE RATTLE OF RATTLESNAKES

The explicit statement of Tinkle (1979) emphasizes a need for long-term field studies based on marked individuals in populations. Despite an obvious need for a uniform marking technique for each major species group of amphibians and reptiles, methods have become so numerous as to allow recent reviews of them (Spellerberg and Prestt 1978; Swingland 1978; Ferner 1979). No single marking system yet seems to be accepted as ideal for all members of a given group.

In rattlesnakes (genera *Crotalus* and *Sistrurus*), several workers describe temporary marking techniques of the rattle itself (copper wire, Fitch and Glading 1949; colored discs, Pendlebury 1972) or tail near the rattle (colored beads, Hudnall 1982). The rattle is a logical place to mark the animal because of its conspicuousness and relative permanence from year to year. We here describe a practical and simple technique for marking the rattle of rattlesnakes: paint it. Our method has the major advantage of being quick and easy to us in the field or lab.

Our painting technique is done by applying permanent water-proof paint to the basal segments of the rattle and distal portion of the tail. We have paint-marked *Crotalus viridis* since 1976 (Gannon, Secoy) and *C. horridus* since 1978 (Brown). Paint may be applied by spraying (Gannon and Secoy 1984) or by dabbing (Preston 1964; Brown, unpublished). In dabbing paint on the rattle, we recommend using "Liquitex®," an acrylic artists' paint (Binney & Smith, Inc., Easton, Pennsylvania 18042) available in a variety of bright colors. The paint is mixed with water to get the desired consistency and is dabbed on the rattle using a small wooden applicator. After drying, this paint is permanent, flexible, waterproof, and long-lasting. Paint-marks have remained visible on rattles of recaptured *C. horridus* for up to four years.

Paint-marking is especially valuable when used with a permanent mark for individual identification (e.g., ventral scale clipping, Brown and Parker 1976). Major advantages of paint-marking are the following (cf. Fitch 1949, and Pendlebury 1972, who noted the first advantage, and Preston 1964 and Gannon and Secoy 1984, who noted the first two):

1. Shedding frequencies may be directly and accurately measured; the number of unpainted basal segments added to the rattle indicates the number of sheds in the interval between captures. The shedding rate is a powerful datum in estimating the age of rattlesnakes when used with growth increments of recaptured individuals. (Incidentally, shed skins of freshly painted snakes occasionally may be found in the field and these can be identified both by the intact paint and scale-clip scars.)

2. Each separate study population may be identified by a different color. If recaptures occur away from release locations (after individuals have moved or dispersed), spatial overlap of snakes from different locations may be recorded. Also, by color-coding each locality, accidentally releasing marked snakes at the wrong place is avoided.

3. Sometimes only glimpsing an escaping rattlesnake is possible; when visual sightings occur, a painted rattle usually may be seen and its color noted, thus reducing the need to exert an all-out capture effort when the snake has gotten away. At least it will be known to be marked.

4. When a number of snakes are measured, weighed, and marked at one time, freshly paint-marked individuals are easily distinguished from unpainted individuals when both are temporarily put together in a single holding container. This makes sorting and handling more efficient and less traumatic to the snakes.

5. Paint on a rattle will be noticeable to a layperson who might happen to see a marked animal, find a dead specimen, or kill a marked snake. A specimen may thus be saved and turned in to wildlife personnel, providing a record of a marked animal whose loss from the study population otherwise may never be known to the investigator. Also, in cases where rattlesnakes are the deliberate targets of a human predator seeking an epidermal souvenir, the indissoluble colored paint may make the rattle a sullied and therefore less desirable "trophy."

The very simplicity of the rattle-painting technique perhaps has been one reason why heretofore, to our knowledge, it has not been formally described. Paint-marking should be applicable to any field study of a rattlesnake where shedding rates and age estimation form the foundations of long-term natural history and demographic research.

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ANURA

CENTROLENELLA FLEISCHMANNI (Glass Frog). BELIZE: CAYO DISTRICT: 7.1 km SSE Belmopan. 4 July 1980. R. E. Olson. REO 5540-5542. Verified by R. E. Olson. To be deposited in St. John's College, Belize City. The frogs were collected as they called from palm fronds above the banks of a rushing stream. Second record for Belize; extends range about 30 km NE San Luis, Cayo District (Henderson and Hoevers. 1975. Milwaukee Publ. Mus. Contr. Biol. Geol. 5:13).

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HYLA CHRYSOSCELIS (Cope's Gray Treefrog). USA: MINNESOTA: Hubbard Co: 12.8 km S Lakely. 20 June 1981. R. E. Olson Collection (REO 5688). Isanti Co: Springvale. 20 June 1970. REO 2977-2978; 30 June 1972. REO 3369-3370. 1.8 km W Cambridge. 25 May 1980. REO 5408-5411. 13.3 km NW Cambridge. 21 June 1983. REO 6205-6206. Kandiyohi Co: 1.2 km E Sunburg. 3 June 1980. REO 5428-5430. 3.8 km E Sunburg. 3 June 1980. REO 5431-5432. 14.8 km W New London. 3 June 1980. REO 5433-5434. 18.7 km E Sunburg. 21 May 1981. REO 5610-5612. Mille Lacs Co: 5.8 km E Princeton. 25 May 1980. REO 5416. Morrison Co: 8.4 km W Pierz. 14 June 1981. REO 5676-5684. Sherburne Co: 6.7 km S Princeton. 25 May 1980. REO 5419. Stearns Co: 3.4 km W Paynesville. 14 June 1981. REO 5430. Swift Co; 27.8 km E Benson. 3 June 1980. REO 5427. Todd Co: 12.5 km E Osakis; 8.5 km E Long Prairie (voice records). R. E. Olson. Verified by R. E. Olson using voice records or karyotypes. There are no published records of this species in Minnesota. *Hyla chrysoscelis* occurs in the western, grassland counties, with no occurrence of *Hyla versicolor (sensu stricto)* documented west of central Stearns Co. Thus, strict allopatry of these species is demonstrated in the ecologically different areas approaching the grasslands: both species occur in forests, but only *Hyla chrysoscelis* in grasslands.

Submitted by **R. EARL OLSON,** 133 So. Cleveland, Cambridge, Minnesota 55008, U.S.A. ●

HYPEROLIUS ARGUS. AFRICA: TANZANIA: Tanga Region. Korogwe District. West Usambara Mts, Ambangulu tea estate, 5°05'S, 38°26'E, 12 km north of Korogwe, 1200 m asl. 23 February 1981. K. M. Howell and S. N. Stuart. Verified by Miss A. G. C. Grandison. British Museum (Natural History) (BM. 1982.565). Adult female collected from herbaceous vegetation 0.3 m above ground level, at edge of road near stream in intermediate altitude rain forest, canopy of which dominated by *Newtonia buchanaii.*

Schiotz (1975. The Treefrogs of Eastern Africa. Steenstrupia, Copenhagen) records this species from "coastal Kenya to Mozambique, in the lowlying eastern parts of the savanna." In Tanzania, it is known from Muheza, Ngomeni, and Amani (in and near the East Usambara Mts), Kilosa, and Morogoro, Dar es Salaam, the Mtwara area, Mafia and Zanzibar islands. This is the first record from the West Usambara Mts, 23 km W Amani and 220 km NE Morogoro.

Submitted by **K. M. HOWELL,** Department of Zoology and Marine Biology, Box 35064, University of Dar es Salaam, Dar es Salaam, Tanzania and **S. N. STUART,** Department of Applied Biology, University of Cambridge, Pembroke St., Cambridge, United Kingdom. ●

LEPTOPELIS VERMICULATUS. AFRICA: TANZANIA: Tanga Region. Lushoto District. West Usambara Mts, University of Dar es Salaam's Mazumbai Natural Forest Reserve, 4°48'S, 38°29'E, 8 mi NE Bumbuli, 1500 m asl. November 1980. S. N. Stuart. Verified by A. G. C. Grandison. British Museum (Natural History) (BM. 1982.582). Korogwe District. West Usambara Mts, Ambangulu Tea Estate, 5°05'S, 38°26'E, 12 km NW Korogwe, 1200 m asl. 20, 23 February 1981. K. M. Howell and S. N. Stuart. Verified by R. Crombie, U.S. National Museum of Natural History (USNM 226810), and A. G. C. Grandison, (BM. 1982.583, BM.1982.584-586). Previously known only from Amani in the East Usambara Mts (23 km due E Ambangulu and 34 km SE Mazumbai) and from Rungwe, ca. 750 km to the southwest (Schiotz. 1975. The Treefrogs of Eastern Africa. Steenstrupia, Copenhagen).

Submitted by **K. M. HOWELL,** Department of Zoology and Marine Biology, Box 35064, University of Dar es Salaam, Dar es Salaam, Tanzania and **S. N. STUART,** Department of Applied Biology, University of Cambridge, Pembroke St., Cambridge, United Kingdom. ●

CAUDATA

AMPHIUMA PHOLETER (One-toed Amphiuma). USA: ALABAMA: Baldwin Co: Fairhope, shore of Mobile Bay 0.4 km S of Fly Creek. 20 March 1984. S. D. Carey and D. M. Steedley. Verified by R. H. Mount. Auburn University Museum (AUM 32391). A cypress swamp, draining into Mobile Bay, is adjacent to the capture site and represents the only available habitat for *A. pholeter* in the immediate vicinity. Extends known range approximately 130 km to the west and is the first record for Alabama. (Mount. 1975. The Reptiles and Amphibians of Alabama. Alabama Agric. Exper. Sta., Auburn, AL; Means. 1977. Florida Mar. Res. Publ. No. 26:37-57).

Submitted by **STEVEN D. CAREY,** Division of Natural Sciences, Mobile College, P.O. Box 13220, Mobile, Alabama 36613, U.S.A. ●

TESTUDINES

ERETMOCHELYS IMBRICATA (Hawksbill). ST. HELENA ISLAND: (Southeast Atlantic Ocean), near Rupert's Bay, NW coast of island. 14 July 1983. Photographed at a depth of 10 m by A. Edwards. Museum of Comparative Zoology (Photo No. 797). The only other record for St. Helena is reported in a letter from A. Loveridge to L. Brongersma (Brongersma. 1982. Marine Turtles of the Eastern Atlantic Coast. In: K. Bjorndal (ed.) *Biology and Conservation of Sea Turtles.* Smithsonian Institution Press, Washington, D.C. pp. 407-416).

Submitted by **J. FRAZIER,** Department of Zoological Research, National Zoological Park, Smithsonian Institution, Washington, D.C. 20008, U.S.A. and **A. EDWARDS,** Department of Zoology, University of Newcastle upon Tyne NE1 7RU, England. ●

GRAPTEMYS VERSA (Texas Map Turtle). USA: TEXAS: McCulloch Co: 10 km SSE Brady on San Saba River at US Hwy 87. 15 March 1984. J. Bertl, T. James and F. C. Killebrew. Verified by F. C. Killebrew. West Texas State University Museum of Natural History (WTSU 9776). Previously recorded only in the Colorado River (Vogt. 1981. Cat. Amer. Amphib. Rept. 280.1-280.2). Extends range into a new drainage.

Submitted by **F. C. KILLEBREW, TERRY L. JAMES** and **JEFF BERTL,** Department of Biology, West Texas State University, Canyon, Texas 79016, U.S.A. ●

PELUSIOS NIGER (Black African Sideneck). AFRICA: LIBERIA: SINO: Sapo National Park, 22.5 km E Juazohn Village. 11 February 1983. E. Glumac, K. Kranz and J. Toah. Verified by R. Bour. Four color slides are deposited in the photographic file of the Division of Amphibians and Reptiles, USNM. The specimen was walking in several cm of water in a narrow creek draining into the Sino River. Sapo National Park is primarily composed of mature secondary evergreen forest (Voorhoeve, 1965 *Liberian High Forest Trees,* Wageningen.) Bour (1983, *Bull. Mus. Natn. Hist. Nat.* ser 4, 5A (1):343-382) could find one record from Liberia. Field work was funded by the Florida State Museum through a grant from the Griffis Foundation.

Submitted by **J. FRAZIER, K. KRANZ,** Department of Zoological Research, National Zoological Park, Smithsonian Institution, Washington, D.C. 20008, U.S.A.; **E. GLUMAC,** College of Agriculture, Texas A & I University, Campus Box 218, Kingsville, Texas 78363, U.S.A.; **J. TOAH,** Wildlife & National Parks, Forestry Development Authority, P.O. Box 3010, Monrovia, Liberia. ●

STERNOTHERUS ODORATUS (Stinkpot). USA: INDIANA: Wayne Co: 5.6 airline km SW Richmond. 13 June 1984. A. Whitman Miller and David P. Young, Jr. Verified by John B. Iverson. Joseph Moore Museum (HR-622). New county record fills hiatus between Henry County, IN (Minton, List and Lodato. 1983. Proc. Indiana Acad. Sci. pp. 489-498) and Darke County, OH (Conant. 1951. The Reptiles of Ohio, 2nd ed. Notre Dame, Ind.: American Midl. Natur.).

Submitted by **A. WHITMAN MILLER** and **DAVID P. YOUNG, JR.,** Biology Department and Joseph Moore Museum, Earlham College, Richmond, Indiana 47374, U.S.A. ●

SAURIA

ANOLIS SAGREI (Brown Anole). CAYMAN ISLANDS: GRAND CAYMAN: between Georgetown and South Sound. 20-26 February 1984. Twenty-two adults definitely identified by dewlap color. Voucher specimen in Minton Collection (No. 1899) from 1 km south of Georgetown. Collected 21 February 1984 by Madge and Sherman Minton. First record from Grand Cayman. Previously known from Little Cayman and Cayman Brac (Grant, C. 1940, Bull. Inst. Jamaica Sci. Ser. No. 2; Schwartz, A. and Thomas, R. 1975, A Checklist of West Indian Amphibians and Reptiles, Carnegie Mus. Nat. Hist. Spl. Pub. No. 1). In the immediate environs of Georgetown it appears to outnumber the endemic *Anolis conspersus;* between Georgetown and South Sound, *conspersus* outnumbers it in about a 2 to 1 ratio (based on sight records).

Submitted by **SHERMAN A. MINTON** and **MADGE R. MINTON.** Indiana University School of Medicine, Indianapolis, Indiana 46223, U.S.A. ●

ANOLIS SAGREI SAGREI (Brown Anole). USA: FLORIDA: Monroe Co: Dry Tortugas, Garden Key. Collected and verified by C. E. Winegarner, W. B. Robertson and W. Hoffman. 8-10 April 1983. Archbold Biological Station (ABS 921). 3 males, 1 female. First specimens from the Dry Tortugas. Nearest localities are Key West, 105 km east and northwestern Cuba, 170 km south. Specimens taken on a large pile of bricks and rubble just east of the moat surrounding Ft. Jefferson. Population currently seems limited to this small portion of the island so introduction may have been very recent. A construction barge moored adjacent to the collection site from October 1981 to June 1982, possibly was a source of colonizing individuals, however, the regular arrival of Park Service boats and private vessels are other possibilities.

Submitted by **CHESTER E. WINEGARNER,** Archbold Biological Station, Route 2, Box

180, Lake Placid, Florida 33582, **WILLIAM B. ROBERTSON, JR.,** South Florida Research Center, Everglades National Park, Homestead, Florida 33030, and **WAYNE HOFFMAN,** Biology Department, University of South Florida, Tampa, Florida 33620, U.S.A. ●

LYGOSOMA CF TANAE. AFRICA: TANZANIA: Kilimanjaro Region. Same District. South Pare, Ndungu Village, 4°20'S, 38°08'E, app. 500 m asl. January 1980. Collected by Ida Msechu. Verified by A. F. Stimson. British Museum (Natural History), (BM.1980.293). Found under leaf litter in banana plantation. Loveridge (1935. Bull. Mus. Comp. Zool. 59(1):11-12) collected the type and other specimens near the mouth of the Tana river in Kenya, and later (1957. Bull. Mus. Comp. Zool. 117 (2):214) gave the range for the species as "coastal Kenya" without listing further localities. This specimen, collected app. 345 km SW of the mouth of the Tana river, is the first record of the species in Tanzania.

Submitted by **K. M. HOWELL,** Box 35064, Department of Zoology and Marine Biology, University of Dar es Salaam, Dar es Salaam, Tanzania and **MS I. MSECHU,** Box 1622, Karatu Secondary School. Karatu, Tanzania. ●

TARENTOLA MAURITANICA (Moorish Gecko). GREECE: PELOPONNESE: Prefecture of Achaia: E border Patra city. 8 June 1971. Collected by D. Matopoulos and M. Kaparianos. Identified by B. P. Chondropoulos. Zoological Museum of Patra University (A-E 2402). The geographic distribution of *Tarentola mauritanica* in Greece is the Ionian islands Ithaki, Kefallonia and Zakynthos, as well as Crete (Ondrias. 1968. Liste des Amphibiens et des Reptiles de la Grèce. Biol. Gallo-Hellen., 1:111). This is the first record for the Peloponnese, indicating a larger range in Greece.

Submitted by **B. P. CHONDROPOULOS,** Section of Animal Biology, Department of Biology, Patra University, Patra, Greece. ●

SERPENTES

DRYMOBIUS RHOMBIFER. BOLIVIA: DEPT. DE LA PAZ: 20 km by river below Puerto Linares. 6 June 1981. Juvenile male (275 mm s-v) collected by T. S. Schulenberg. Louisiana State University Museum of Zoology (LSUMZ 43279). 29 June 1981. Adult male (841 mm s-v) collected by A. P. Capparella. LSUMZ 43278. Verified by D. A. Rossman. First specimens reported from Bolivia (Peters and Orejas-Miranda. 1970. Bull. U.S. Natl. Mus. 297, p. 99).

Submitted by **RANDY H. VAETH** and **DOUGLAS A. ROSSMAN,** Section of Herpetology, Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana 70893, U.S.A. ●

LAMPROPELTIS CALLIGASTER CALLIGASTER (Prairie Kingsnake). USA: MISSOURI: Mississippi Co: 8 km S Charleston on Mo Rt 102. 28 April 1984. Michael A. Morris and Mary Beth Morris. Verified by M. A. Morris. Southern Illinois University at Carbondale (SIUC R-1797). Road-killed adult. Surrounding habitat grassy fields. First record for county and Missouri lowlands (Anderson. 1965. The reptiles of Missouri. Univ. Missouri Press, Columbia). Known from Jackson Purchase of Kentucky (Barbour. 1971. Amphibians and reptiles of Kentucky. Univ. Press of Kentucky, Lexington), but absent from Mississippi border of Illinois adjacent to Missouri lowlands (Smith. 1961. The amphibians and reptiles of Illinois. Illinois Nat. Hist. Surv. Bull. 28:1-298). Helps fill gap in north-central part of range (Blaney, 1979, *Lampropeltis calligaster*. Cat. Amer. Amphib. Rept.:229.1-229.2).

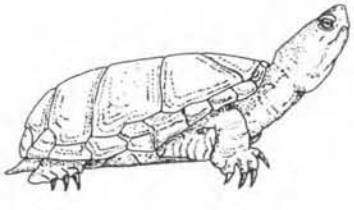
Submitted by **MICHAEL A. MORRIS,** Department of Zoology, Southern Illinois University at Carbondale, Carbondale, Illinois 62901 and **MARY BETH MORRIS,** 322 N. 9th Street, Murphysboro, Illinois 62966, U.S.A. ●

PITUOPHIS MELANOLEUCUS SAYI (Bullsnake). USA: TEXAS: Medina Co: 0.1 km W Castroville on US 90. 27 May 1984. C. T. McAllister and E. A. McAllister. Verified by R. Ward. North Texas State University Herpetological Collection (NTSUHC #R 655, head only). This represents a new county record filling a distributional hiatus between Bexar and Uvalde counties of southcentral Texas (Raun and Gehlbach. 1972. Amphibians and Reptiles in Texas. Dallas Mus. Nat. Hist. Bull. 2).

Submitted by **CHRIS T. McALLISTER,** Renal-Metabolic Lab (151-G), Veterans Administration Medical Center, Dallas, Texas 75216, U.S.A. ●

SONORA SEMIANNULATA (Ground Snake). USA: TEXAS: Kimble Co: 6.4 km N Jct. off US Hwy 83. 13 April 1984. C. T. McAllister and J. R. Glidewell. Verified by R. Ward. North Texas State University Herpetological Collection (NTSUHC R667-669). New county record and partially fills the distributional gap between Trans-Pecos and Edwards Plateau populations (Raun and Gehlbach. 1972. Amphibians and Reptiles in Texas. Dallas Mus. Nat. Hist. Bull. No. 2. These specimens were collected under limestone shelf rock in cedar glade habitat.

Submitted by **CHRIS T. McALLISTER,** Renal-Metabolic Lab (151-G), Veterans Administration Medical Center, Dallas, Texas 75216, U.S.A. ●



NEW DISTRIBUTIONAL RECORDS FOR SOME SEMIAQUATIC AMPHIBIANS AND REPTILES FROM THE RÍO SABINAS BASIN, COAHUILA, MEXICO

Milstead (1960) recognized 14 relict species inhabiting the Chihuahuan Desert, and identified the Rio Sabinas as an area with mesic-adapted relict species. Conant (1978) recognized 19 relict or riparian species from the Chihuahuan Desert, but omitted reference to several other semiaquatic forms that are apparently not restricted to riparian situations.

In May, 1983, we traversed the upper Río Sabinas drainage system, which until recently lacked adequate roads. Our collections include range extensions of relict and riparian species into the desert. These are marked below with an asterisk, and supplement localities recorded by Milstead (1960) and Conant (1978). Records of species he listed were verified by Conant (pers. comm.). Other data reflect new localities of semiaquatic species not restrictred to riparian habitats. Specimens are deposited in the Bobby Witcher Memorial Collection (BWMC) at Avila College, Kansas City, MO 64145.

SALIENTIA

BUFO PUNCTATUS (Red-spotted Toad): COAHUILA: 29 km N Musquiz (2 km N Puente El Corrizo) on Hwy 93. N. L. Laposha and J. S. Parmerlee. 28 May 1983. BWMC 2135.

BUFO SPECIOSUS (Texas Toad): COAHUILA: 43 km N Musquiz (16 km N Puente El Corrizo) on Hwy 93. D. D. Smith and R. Powell. 28 May 1983. BWMC 2136. 14 km N Musquiz (1 km S Puente Río Sabinas) on Hwy 93. N. A. Laposha and J. S. Parmerlee. 28 May 1983. Not catalogued, sent to the Direccion General de Flora y Fauna Silvestres, Mexico, D. F.

*BUFO VALLICEPS** (Gulf Coast Toad): COAHUILA: 37 km N Musquiz (10 km N Puente El Corrizo) on Hwy 93. R. Powell and D. D. Smith. 28 May 1983. BWMC 2134. 16 km N Musquiz (1 km N Puente Río Sabinas) on Hwy 93. N. A. Laposha and J. S. Parmerlee. 28 May 1983. Not catalogued, sent to the Direccion General de Flora y Fauna Silvestres, Mexico, D. F. Río Sabinas at San Juan de Sabinas. D. D. Smith. 27 May 1983. BWMC 2133.

RANA BERLANDIERI (Rio Grande Leopard Frog): COAHUILA: 10 km N Musquiz, Hwy 93. D. D. Smith and R. Powell. 28 May 1983. BWMC 2129. 7 km N Musquiz, Hwy 93. R. Powell and D. D. Smith. 28 May 1983. Uncatalogued specimen sent to the Direccion General de Flora y Fauna Silvestres, Mexico, D. F. Tadpoles, 27 km N Musquiz at Puente El Corrizo, Hwy 93, in pool of intermittent tributary stream. J. S. Parmerlee and R. Powell. 27 May 1983. BWMC 2148.

SCAPHIOPUS COUCHII (Couch's Spadefoot): COAHUILA: 34 km N Musquiz (6 km N Puente El Corrizo) on Hwy 93. N. A. Laposha and J. S. Parmerlee. 28 May 1983. BWMC 2131. 32 km N Musquiz (5 km N Puente El Corrizo) on Hwy 93. R. Powell and D. D. Smith. 28 May 1983. BWMC 2130.

TESTUDINES

KINOSTERNON FLAVESCENS (Yellow Mud Turtle): COAHUILA: 27 km N Musquiz at Puente El Corrizo, Hwy 93, in pool of intermittent tributary stream. J. S. Parmerlee, R. Powell, N. A. Laposha, and D. D. Smith. 28 May 1983. BWMC 2149, uncatalogued specimen sent to the Direccion General de Flora y Fauna Silvestre, Mexico, D. F.

*PSEUDEMYS CONCINNA** (River Cooter): COAHUILA: 27 km N Musquiz at Puente El Corrizo, Hwy 93, in pool of intermittent tributary stream. D. D. Smith, N. A. Laposha, R. Powell, and J. S. Parmerlee. 28 May 1983. BWMC 2087.

*TRIONYX SPINIFERUS** (Spiny Softshell): COAHUILA: 27 km N Musquiz at Puente El Corrizo, Hwy 93, in pool of intermittent tributary stream. N. A. Laposha, D. D. Smith, J. S. Parmerlee, and R. Powell. 28 May 1983. BWMC 2086, uncatalogued specimen sent to the Direccion General de Flora y Fauna Silvestres, Mexico, D. F.

SERPENTES

*NERODIA ERYTHROGASTER** (Plainbelly Water Snake): COAHUILA: Río Sabinas at San Juan de Sabinas. N. A. Laposha and J. S. Parmerlee. 27 May 1983. BWMC 2144.

*NERODIA RHOMBIFERA** (Diamondback Water Snake): COAHUILA: 27 km N Musquiz at Puente El Corrizo, Hwy 93. R. Powell. 27 May 1983. BWMC 2143.

THAMNOPHIS MARCIANUS (Checkered Garter Snake): COAHUILA: 12 km N Musquiz on Hwy 93. J. S. Parmerlee and N. A. Laposha. 28 May 1983. BWMC 2138. 10 km N Musquiz on Hwy 93. N. A. Laposha and J. S. Parmerlee. Uncatalogued specimen sent to the Direccion de Flora y Fauna Silvestres, Mexico, D. F.

*THAMNOPHIS PROXIMUS** (Western Ribbon Snake): COAHUILA: 15 km N Musquiz at Puente Río Sabinas, Hwy 93. R. Powell. 27 May 1983. BWMC 2146. 27 km N Musquiz at Puente El Corizo, Hwy 93. R. Powell. 28 May 1983. BWMC 2147, uncatalogued specimen sent to the Direccion General de Flora y Fauna Silvestres, Mexico, D. F.

ACKNOWLEDGMENTS

We wish to thank Dr. Roger Conant for taking the time to verify records. We also express appreciation to the Direccion General de Flora y Fauna Silvestres, Mexico, D. F., who granted us permission to collect in Mexico. The permit was issued to R. Powell.

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Milstead, W. W. 1960. Relict species of the Chihuahuan Desert. Southwestern Nat. 5:75-88.

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BOOK REVIEWS

Amphibians and Reptiles of New England: Habitats and Natural History, by Richard M. DeGraff and Deborah D. Rudis. Illustrated by Abigail Rorer. University of Massachusetts Press, Amherst. 1983, 112 pp., 6 black-and-white photos, 56 drawings, 57 maps. $14.00 cloth, $6.95 paper.

In the first comprehensive survey of the New England herpetofauna in a very long time, the authors have undertaken the considerable task of synthesizing nearly 70 years of literature and documenting the distribution of 56 taxa. The book is intended for use by the scientific community, although it also will be interesting to amateurs.

The text is introduced by sections on the history of herpetological investigations, habitats present, and population status of rare species. The species accounts that follow discuss abundance, habitat use, breeding biology, home range, and food. Accompanying maps illustrate general distributions and denote county records with dots. There is a wildlife management emphasis to much of the book, which reflects the conservation background of the authors. I find this orientation timely, particularly in light of the recent emphasis by many state agencies on nongame wildlife programs.

Despite this useful perspective, the book is weak in aspects of its systematic and ecological coverage. I feel that one of the principal functions of a regional work is to document morphological characteristics of local populations. Yet, no original measurements were made, and there is little discussion of regional color patterns. The weak patterning of northeastern *Scaphiopus holbrookii* compared to southern individuals should have been documented, for example. Moreover, descriptions of habitats sometimes emphasize vegetation features that are of questionable importance to reptiles and amphibians. The heavy reliance on personal communications tends to promote this incomplete view of habitat use, and it results in habitat specificity being implied when it is not really present. For example, it is unlikely that old fields are a "special" habitat requirement of *Terrapene carolina,* or that *Crotalus horridus* is restricted to forests with high rodent density. Rodent density undergoes dramatic temporal fluctuation, and in any event current *Crotalus* distribution is more closely tied to recent historical factors (e.g. eradication campaigns). Statements about the important role of herptiles in insect and rodent control (p. 10) also seem a bit sweeping, particularly considering recent studies that suggest resource superabundance in the northeast.

Concerning evolutionary topics, the discussion of speciation in Ambystomid salamanders is unfortunately worded to sound as if reproductive isolation was caused *by* glaciation rather than having developed *during* glaciation. Furthermore, hybridization between *Bufo americanus* and *B. woodhousii fowleri,* so frequent on Cape Cod and in coastal Connecticut, is not discussed at all. A recent MS thesis completed at the University of Connecticut provides additional data on intergradation between *Chrysemys p. picta* and *C. p. marginata.*

The distributional data presented, although by far the best in print, suffers from an incomplete review of collections. Several major New England collections, including those at the Yale Peabody Museum (YPM) and University of Connecticut (UCM), were apparently not examined. Notable omissions were those of Connecticut specimens of *Ambystoma tigrinum* (YPM) and *Trionyx spiniferus* (UCM). Some UCM leopard frogs also appear to be *Rana utricularia* rather than *pipiens.* In addition, Cope's classic *Batrachia of North America* (1889; U.S. Nat. Mus. Bull. 34), with its wealth of New England data, was not consulted.

I found most comments on abundance reasonable. However, the uncommonness of *Thamnophis sauritus* is overrated; it is regularly found in marshes. Recent discoveries of some large *Ambystoma* cf. *laterale* populations also suggest that members of the *jeffersonianum* complex may be more common than previously thought. Additionally, further discussion of the extent of the rarity of *Eumeces fasciatus* and *Scaphiopus holbrookii* would have been interesting. Many feel that both these species are well on the way to

extinction in New England. Finally, the tabular listing of *Desmognathus ochrophaeus* as rare in Connecticut (p. 8) is apparently a typographical error.

Even with the several shortcomings of the text, the authors are to be commended for their substantial compilation. They have summarized a great deal of regional literature and have included many original observations. Readers will find the comments section of the species accounts particularly enlightening. Individuals interested in the northeastern herpetofauna will find this a useful volume.

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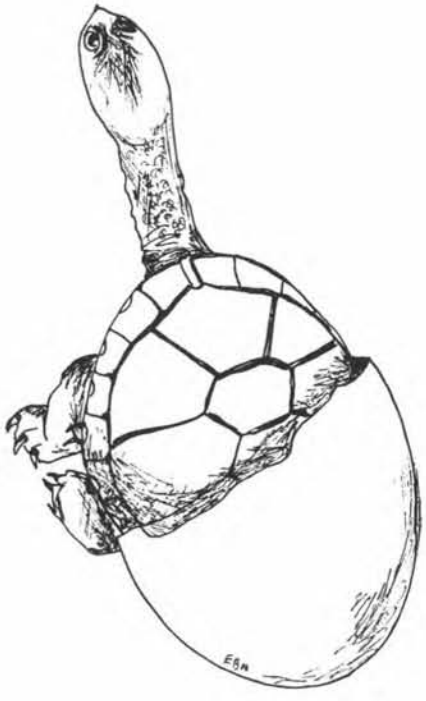
A Review of the Diseases and Treatments of Captive Turtles, by James B. Murphy and Joseph T. Collins, 56 pp. 1983. AMS Publishing, Lawrence, Kansas 66044.

This book, as the authors have stated, is useful primarily for those who deal with chelonians professionally, particularly veterinarians. But it should be found in the library of anyone who keeps turtles, as it is especially useful when consulting with a professional. The most valuable part of the book is the extensive bibliography after each chapter and at the end. The authors have done an exhaustive amount of work to bring together, in one volume, widely scattered information, consulting a variety of authorities, both with medical and non-medical backgrounds. Furthermore, the authors do a good job throughout the book of stating the findings of many researchers, yet reserving judgement about the "correct" procedure.



The preface must be read by all. The ethical statement made by the authors is important enough that I quote a part of it here. "The removal of a wild turtle from its natural environment, for whatever purpose, carries with it the ethical responsibility to house and maintain that turtle in a healthy state. Persons not wishing to shoulder that responsibility should not attempt to maintain captive turtles."

Although the contents may have been arranged in a number of ways, starting with "Environmental Factors" was a wise choice, since most problems are secondary to poor husbandry. Environmental factors, such as water temperature, light (quality and quantity), humidity and psychological requirements are listed and, for the most part, discussed adequately. Certain important points that the authors state include: matching the natural environment as closely as possible, minimum of 30-day quarantine of new arrivals, cleanliness of water, and availability of temperature gradients. One area that might have been stressed more in terms of importance was "Psychological Requirements." Many times this can be a cause of sudden illness in a long-term captive due to incompatibility during the mating season.

In the section, "Viral, Bacterial, Mycotic and Algal Infections," several good points are brought up. One stresses the importance of good hygiene of handlers so the handler doesn't get the disease. Another stresses increasing the temperature of the environment to help stimulate the immune system. Another states a very important fact: infections are often secondary to poor husbandry. Another important fact: know all about the drugs you are using - don't guess! Finally, the importance of a "culture and sensitivity" for identification and treatment of bacteria and fungi should have been better stressed by the authors. Although it may seem costly to the layman, it may prevent a delay in treatment without "guessing" which antibiotic will work, and perhaps prevent the loss of a valuable animal or animals.

In the sections, "Protozoan Infections," "Helminth Infections" and "Arthropod Infestations," it is emphasized that several fecal (stool) exams may be necessary to identify specific types of intestinal parasites so the correct "wormer" is used. This usually takes a professional. Another important point the authors stated is that one of the most effective ways of controlling parasite levels is through extreme cleanliness and sanitation. Furthermore, disinfectants must be carefully used, and those not recommended include ones containing coal tars, pine oils, carbolic acid, phenols, or heavy metals.

In the section "Dietary Deficiencies," it is stated that diet requirements (especially nutritional supplements) are still inadequately known. This is a big dilemma for any chelonian keeper, and no one diet has been proven successful for more than a few species; so the authors have listed an array of diets by many writers. In most cases, variety is the key. The authors recommended that no shellfish of any type be fed - but why?

In the section "Non-Infectious Diseases and Injuries" certain bacterial infections are mentioned, which may have been better included in a previous section. It does cover several medical problems, including cuts, shell repair, and nail and beak trims. Some can be handled by the layman, and some should be handled by professionals.

"Surgical Procedures" is definitely geared to the professional, especially the veterinarian, but can be understood by anyone with a biological background. Again, a good point is brought up by the authors: proper husbandry techniques will eliminate many surgeries. The radiology and electrocardiology segments might have been better placed under the previous section or a medical heading, but this is a minor point.

The "Necropsy Technique and Specimen Collection" section is again geared more for the professional, but it does bring up an important fact for the layman. A careful, thorough postmortem by a qualified pathologist familiar with reptilian tissues can be diagnostic for the dead — and the living. A very good detailed example is listed in this section.

The final section is the main bibliography. The bibliography itself, along with the sectional bibliographies, makes the book a valuable part of your library. This book would definitely make a nice gift for your veterinarian.

DAVID C. ZEITZ
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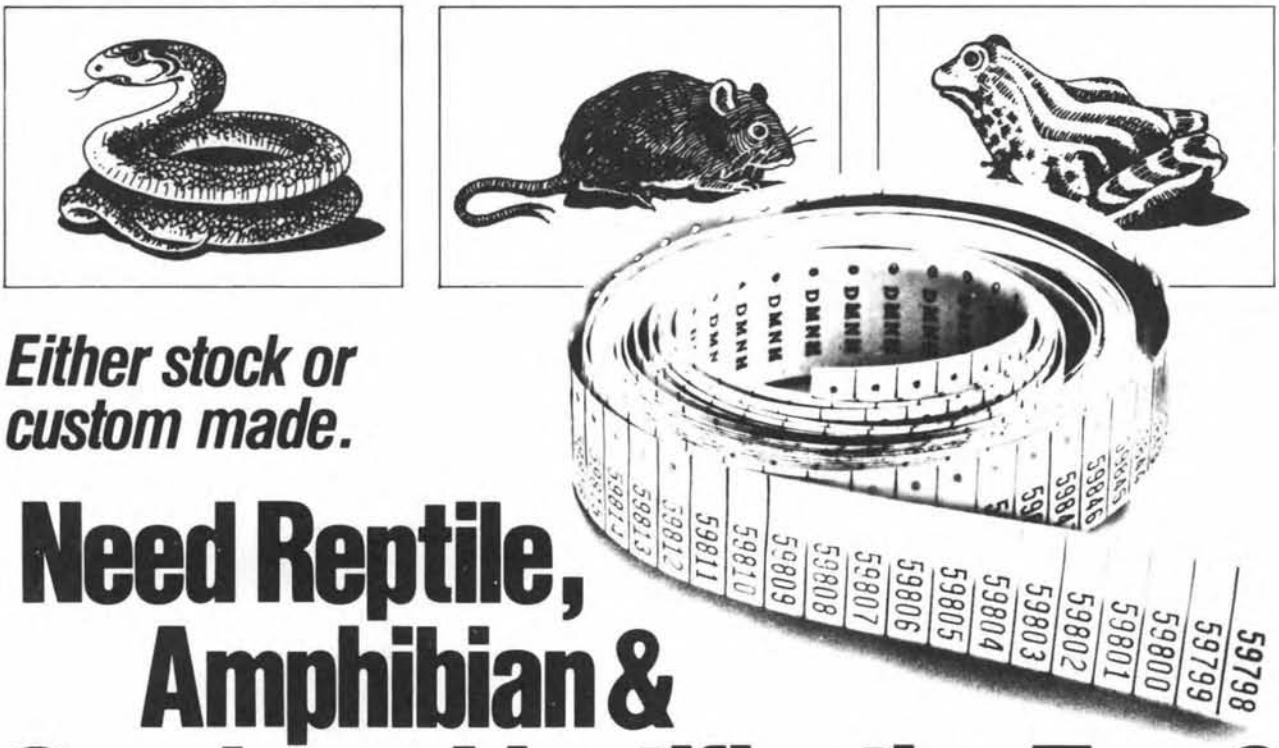
Iguanas of the World: Their Behavior, Ecology and Conservation, by Gordon M. Burghardt and A. Stanley Rand (eds.). 1982. Noyes Publications. 472 pp. $55.

Iguanines include a small but important group of lizards. Their large size, specialization for herbivory and adaptation to a diversity of ecosystems makes them ideal subjects for investigating a variety of interesting biological questions. Their attractive appearance, longevity, large size, palatability, and restriction of many to fragile habitats has led to heavy exploitation of them, both direct and indirect, by humans. Most, if not all, forms are threatened to some degree with extinction.

Burghardt and Rand have undertaken the ambitious task of organizing current knowledge on this group and focusing future investigation. Considering what was previously available, I suggest they have succeeded admirably. The general introduction and prologues to each of the six sections (Systematics and Biogeography, Food and Energetics, Demography and Life History Strategies, Adaptive Behavior and Communication, Social Organization, Conservation and Management) summarize the individual chapters well and crystalize the most important facts, hypotheses and approaches. The six topics reflect current interest and are logically arranged. The writing is well edited.

As in many symposium proceedings the contributions vary in breadth, readability and rigor of support of their conclusions. It is obvious from many contributions that only



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additional long-term, intensive research will more definitely focus the issues and answer the most important questions.

The section on Systematics and Biogeography includes two chapters, one by Etheridge and the other by Blanc. Readers of these two chapters will obtain a good grasp of the taxonomy and current hypotheses of the evolutionary history of the iguanines. Etheridge's checklist, in particular, should prove a valuable starting point for those developing an interest in the group.

The section on Food and Energetics contains four chapters with rather different approaches that mesh well. Nagy presents a general model relating energy requirements to body size in iguanid lizards. It is based on studies of field metabolic rates of free living lizards (mostly insectivores) using doubly-labelled water techniques. He suggests how conservative this relationship seems to be and predicts what we should expect as data on energy requirements of more iguanas accumulate. Iverson offers a clear definition of herbivory, emphasizes the functional anatomy of iguanine herbivory, and discusses whether large size or herbivory evolved first. McBee and McBee document experimentally that hindgut fermentation produces volatile fatty acids that are a significant energy source to the green iguana. Auffenberg presents an extensively documented field study of feeding of the Caicos ground iguana, showing the complexity of factors to be considered in studying a foraging herbivore. He suggests that iguanas are highly selective feeders and not motivated solely by energy content as some simple foraging models suggest.

The section of Demography and Life History Strategy contains five chapters that point out variations in life-history traits among iguanas. Wiewandt summarizes variation among the iguanines in several life-history traits. He offers several speculative hypotheses for their evolution and he correctly points out that none but serious long-term efforts will succeed in significant advances in our knowledge. Rand and Green cleverly extract data from museum collections on geographic variations of the reproductive cycle of *Iguana iguana* and demonstrate a correlation of the reproductive cycle with the timing of the wet and dry seasons. Iguanas mate at the beginning of the dry season and hatching occurs at the beginning of the wet season. Thus, incubation occurs when it is appropriately dry and warm and hatchlings emerge to an abundant food supply of new leaves. Harris and Van Devender in separate chapters increase our knowledge of basic natural history of *Iguana* and *Ctenosaura* and demonstrate the difficulty involved in documenting iguanine demography. The growth rates of *Iguana* vary both geographically and seasonally. Van Devender speculates that herbivory may have preceded the evolution of large size in iguanas. Case presents the first detailed natural history account of the insular giant *Sauromalus*. Aside from large size the insular forms are unique in being very sedentary, showing an expanded niche, lacking aggression and having remarkably sporadic reproduction. In some years they are subject to devastating droughts during which reproduction ceases and mortality is high. Case presents a model invoking predation and starvation as cofactors in the evolution of large body size of these forms.

One of the special problems in constructing life-tables of the long-lived iguanines is the difficulty in accurately aging the oldest individuals. Several, e.g. Wiewandt p. 124, Dugan and Wiewandt p. 307, assume iguanas to have indeterminate growth that continues, albeit slowly, throughout life. If this is true, indirect data such as growth rings might be useful for determining absolute age; if not, such data can be seriously misleading (see Case p. 191). Only monitoring programs that follow marked individuals for perhaps decades will determine whether or not iguanine growth is truly indeterminate and reveal the true age structure of the populations.

The section on Adaptive Behavior and Communication seems random, which reflects the unfocused state of many aspects of the field of animal behavior. The first three chapters describe action patterns. Carpenter compares in his general qualitative style the aggressive displays of a diversity of iguanine species. Greenberg and Jenssen concentrate on the detail of displays of a small captive colony of *Brachylophus*. Distel and Veazey concentrate on an action pattern inventory of a captive group of *Iguana*. Each of the three are thoroughly descriptive but emphasize a different level of focus. The trio points out how hopelessly far we are from a complete understanding of display communication of any iguana species.

The last two chapters in the behavior section, one by Drummond and Burghardt the other by Boersma seem totally unrelated to each other or the previously described three chapters in this section. The first is an observational and experimental study of orientation and dispersal in hatchling *Iguana*. Hatchling iguanas do not disperse randomly but in the most advantageous direction; their choice of direction is influenced by their peers but other important environmental cues are obscure and probably complex. Boersma provides evidence for the hypothesis that Galapagos marine iguanas *(Amblyrhynchus)* form sleeping aggregations (cuddle) to retain heat for faster more efficient digestion. The aggregation seems to serve functionally like the burrow of the land iguanas.

The fifth section, Social Organization, contains five chapters. The first chapter by Dugan and Wiewandt and the last by Ryan are comparative and attempt to provide an evolutionary framework to explain variations in social organization. Dugan and Wiewandt present terms and models currently used by sociobiologists. They point out factors that may influence through natural selection the social organization of the iguanines. They emphasize the uniqueness of iguanine social organization among the iguanid lizards but most of the discussion details known or suspected determinates of iguanine social behavior in a rambling non-comparative fashion. A concise tabular presentation that compares similarities and differences between iguanines and other iguanids and includes possible differences in the selective environment would have been a useful addition to their chapter.

Ryan's chapter on variation of chuckwalla mating systems includes concise, testable models of how variations of the environment and the cost of territoriality can alter behavioral strategies that in turn influence social organization. It provides an excellent example of how to start an analysis of the evolution of social organization.

The three middle chapters of the fifth section are noncomparative descriptions of social behavior of three different iguana species. Differences in emphasis, focus and the detail presented make comparison of the chapters by the reader difficult. Dugan clearly relates age to differences in mating strategy among male *Iguana* and shows that males do not actively "control" females or their critical resources. Hers is the most quantitatively documented of the three chapters. Werner describes the seasonal ontogeny of male territories in *Conolophis subcristatus*, shows the importance of the male-constructed burrow during the breeding season and emphasizes the dynamics of the male-female interaction. Christian and Tracy emphasize the nesting dynamics of *Conolophis pallidus* and detail the variability of nest construction and defense behavior. All three chapters provide important baseline information for future study of these and other species.

The final section on conservation and management begins with an introduction and is followed by a chapter by Fitch, Henderson and Hillis. Together these two contributions clearly detail the status of Central American and Caribbean iguanas. Strikingly absent is a chapter on status and management of the Galapagos iguanas. Gibbons and Watkins provide a general account of the natural history and status of *Brachylophus* in the South Pacific. The epilogue, a plea for the iguana as a peace symbol by Burghardt is entertaining but perhaps might have been replaced with a statement of overview with more heuristic impact. The volume contains important material that should be read by anyone interested in research, conservation or management of iguanas. Hopefully, in a decade or two, a more sophisticated sequel will result as was spawned by Milstead's 1967 symposium on lizard ecology.

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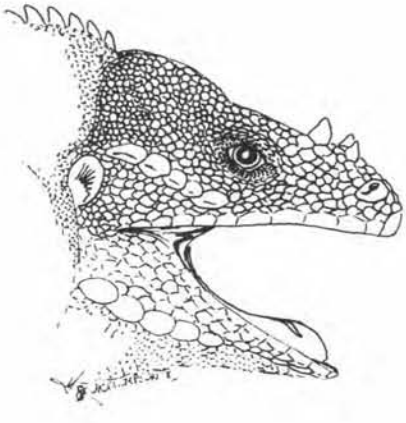

The Ecological Impact of Man on the South Florida Herpetofauna, by Larry Davis Wilson and Louis Porras 1983. The University of Kansas Museum of Natural History and World Wildlife Fund - U.S. $7.00 postpaid.

This book discusses the several intertwining environmental problems peculiar to southern peninsular Florida in a most lucid and readable manner. Consisting of 89 pages (+ i-vi) within which are discussed the environment, both historic and present, the severe and immediate problems created by a burgeoning human population and the status of the herpetofauna, native and introduced, it is a publication which should be of extreme interest to anyone with any affinity whatever to the "Sunshine State."

Besides being keen field biologists, the status of both authors in Florida (Wilson being an educator and Porras, until recently, being involved in the animal trade) has not only allowed them immediate access to reported introductions of alien reptiles and amphibians, but also given them the opportunity to critically evaluate such reports on both the short and long term basis.

While the introduction of herpetofauna has been reported in several prior publications, this is the first in several years to report on all known established introductions and to mention, at least cursorily, numerous failed introductions. It is, perhaps, the only booklet to explore the dramatic role played by the rampant environmental alterations which are occurring daily in Florida as they pertain to the herpetofauna. One may read of geologic, physiographic, hydrographic, climatic, vegetational and populational changes, the present as opposed to the historic, and gain insight and perspective while so doing.

The Florida as we knew it in the '50s, '60s, or even the '70s is a thing of the past. Unfortunately the environmental alterations have not lessened in the '80s. Indeed, the pressures of the never-ending flood of humanity have now grown to include most, if not all, of the counties south of a line connecting Tampa Bay, Gainesville and Jacksonville.

Where once existed wetlands now stand shopping malls; along the well drained central ridges so crucial to the existence of numerous threatened endemic poikilothermic creatures are citrus groves and mobile home parks of immense proportions.

While the "approaching ecocollapse" mentioned by the authors pertains specifically to southern Florida we will, I fear, see it echoed in more northerly areas of the state within the next decade or two.

In addition to the thought provoking text the book contains three maps or charts, five tables, 33 excellent quality black and white photographs, an extensive bibliography, appendix and an index to scientific names.

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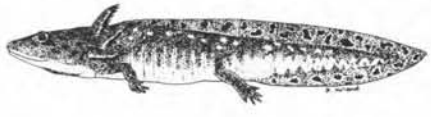

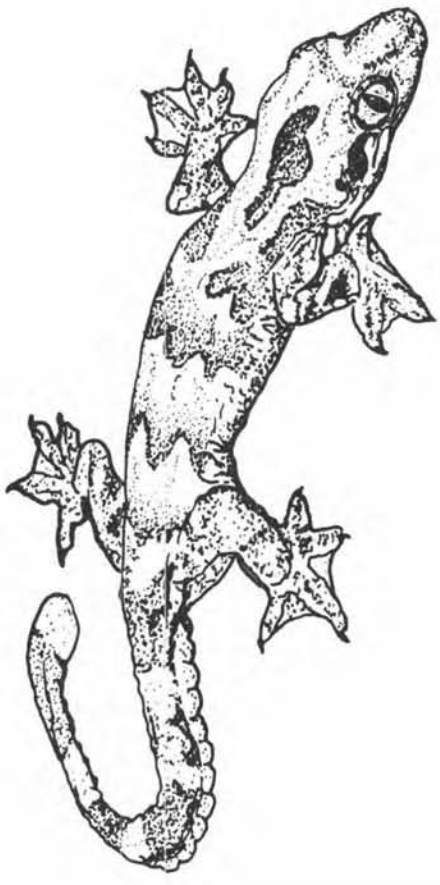

NEWSNOTES

NEW JERSEY STATE MUSEUM COLLECTION

The New Jersey State Museum has recently completed renovation of a new collection storage range for fishes, amphibians and reptiles. The ichthyological collection of The Wetlands Institute, made mainly by Lehigh University and Stockton State College, and the herpetological collection of the late James D. Anderson of Rutgers University have been donated to the museum and are now catalogued and incorporated into the museum's range. The collection is made up of more than 2,000 lots of fishes, amphibians and reptiles collected from across the State and its coastal waters during the 1950s, 1960s and 1970s. The amphibian collection is strong in series lots, particularly relating to specimens of *Ambystoma* adults and larvae, while the fish collection is strongest in bay and estuarine species. Computerization of the records of this collection will be undertaken this coming year. Persons interested in examining parts of this collection may do so by contacting:

Raymond J. Stein
Bureau of Science
New Jersey State Museum, CN-530
Trenton, New Jersey 08625, U.S.A. ●

NIXON GRIFFIS ESTABLISHES FUND FOR ZOOLOGICAL RESEARCH

New York Zoological Society trustee Nixon Griffis has established a unique fund for zoological research. Open to zoo and aquarium scientific staff members across the nation, fund recipients may be curators, keepers, veterinarians, and research and consulting biologists. Programs to be considered for support include those in: animal behavior, veterinary medicine, reproductive biology, genetics, exhibition design and other research areas that address the care, management and propagation of wildlife in captivity.

Grants, not to exceed $3000, will be awarded biannually. For information about the Fund and grant applications, interested biologists are urged to write to:

The Nixon Griffis Fund
for Zoological Research
c/o New York Zoological Society
185th Street and Southern Blvd.
Bronx, New York 10460, U.S.A. ●

HERP SLIDES REQUESTED

The Nevada Chapter of The Wildlife Society is nearing completion of a slide-tape program entitled *Silver Amphibians and Reptiles*. This conservation education tool will be available for free presentations and sale to the public in 1985. A few more slides are needed to complete the program. High quality color slides, horizontally oriented, depicting the animals and their habitats are being sought. Slides need not have been taken in Nevada but must be representative of the Silver State. All original slides will be returned to the owners. Photographers whose slides are selected for the program will be acknowledged in the written narrative. Specific slides needed are: bullfrog eggs, desert tortoise, rattlesnake combat dance, northwestern pond turtle. Please contact:

Rex Baxter
Nevada Chapter, The Wildlife Society
c/o Bureau of Land Management
P.O. Box 831
Elko, Nevada 89801, U.S.A. ●

PATHOLOGY COLLOQUIUM PROCEEDINGS

The Proceedings of the First International Colloquium on Pathology of Reptiles and Amphibians are now available. The Proceedings from this colloquium, held 29 September - 2 October 1982 in Angers, France, consist of about 280 pages, with 60 plates, in fifty contributions. Following the introduction, there are three major sections: Physiopathology, Microbial and Parasitic Diseases; Tumours and Lesions of the Integument; and Developmental Abnormalities.

Copies of the Proceedings are 220.00 FF each + 20,00 postage. Order from:

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[1] Joint committee with the Herpetologists' League

[2] Joint committee with the American Society of Ichthyologists and Herpetologists

HERPETOLOGICAL REVIEW EDITORIAL POLICY

The following statement-of-purpose appeared in the Introduction to the first issue of **Herpetological Review** in 1967 (Corson Hirschfeld, Editor):

> "**Herpetological Review** incorporates the Ohio Herpetological Society Newsletter. Its primary function, as the name states, will be to review herpetology, past and present, in terms of the individuals, institutions, literature and other components of the field. Perhaps equally important, the **Review** will provide a unique means of communication among persons interested in amphibians and reptiles. We believe it will be of interest to all persons in herpetology and we hope all members will find it informative and entertaining."

Herpetological Review still remains true to that purpose. We will continue to publish semi- and non-technical articles (original research should be submitted to the **Journal of Herpetology**—see inside front cover for address), book reviews, institutional and regional society news, research requests of SSAR members, letters from readers directed to the field of herpetology, illustrations, and photographs. Manuscripts submitted must be typed, double-spaced, on 8½ X 11 paper, and should be sent in duplicate. Unpublished photographs of an unusual nature or of uncommon amphibians and reptiles may also be submitted. Submissions should be black-and-white 8 X 10, glossy prints, and should be accompanied by a descriptive caption. The name and address of the contributor should be taped or penciled on the back of each print. Return of photographs cannot be guaranteed unless adequate return postage is provided. Unused photographs which the editors have requested to examine will be returned at our cost.

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