HERPETOLOGICAL HUSBANDRY

Notes on the Captive Reproductive Behavior of the Asiatic Four-lined Skink, *Eumeces quadrilineatus*

AKIKO HOSONO
and
TSUTOMU HIKIDA
Department of Zoology, Graduate School of Science, Kyoto University, Kitashirakawa, Sakyo, Kyoto 606-8502 Japan
e-mail (AH): akiko@zoo.zool.kyoto-u.ac.jp

Eumeces quadrilineatus ranges through southern China, Vietnam, Cambodia, and Thailand (Taylor 1935). It has been grouped with the American four-lined forms (*E. gilberti, E. lagunensis,* and *E. skiltonianus*) as the *E. skiltonianus* Species Group (Lieb 1985). Tanner (1957) observed reproduction of *E. skiltonianus* and presented data for the number of eggs per clutch, egg size, and hatchling size in that species. Based on counts of oviducal eggs, Punzo (1982) reported clutch sizes for *E. gilberti* and *E. skiltonianus*. However, there are no published accounts of reproduction in *E. quadrilineatus*. This report, based on captive observations, is the first published information regarding the reproductive traits of this species.

Two females, collected from Cheung Chau Island, Hong Kong, on 25 April 1997, were brought back to our laboratory, labelled #1 and #2, and set up individually in small, round, plastic cages (10 cm [length] x 6 cm [height]) with paper substrate and a water bowl. On 14 May 1997, Female #1 laid one egg with a soft yellowish-white shell, to which she paid no attention. Female #1 and the egg were transferred to a larger transparent plastic rectangular cage (20 cm [length] x 13 cm [width] x 13 cm [height]). Female #2 was also moved to a cage of the same size. Each cage was furnished with 5 cm of soil, a broken flowerpot for shelter, and a water bowl. The soil was moistened with water spray every third or fourth day. Ambient room temperature varied between 23°C and 25°C throughout the observation.

TABLE 1. Measurements (in mm and g) of the females and hatchlings of *Eumeces quadrilineatus*, taken immediately after hatchling. SVL = snout–vent length, HL = head length, HW = head width, TL = tail length, and BM = body mass.

	SVL	HL	HW	TL	BM
Female #1	74.8	13.8	7.8	75	5.02
Female #2	73.2	13.7	7.8	55	5.07
Hatchling #1	25.9	6.3	3.6	36	0.33
Hatchling #2	24.6	5.6	3.7	34	0.30
Hatchling #3	25.1	6.6	3.6	33	0.30
Hatchling #4	24.9	6.5	3.8	35	0.32
Hatchling means	25.1	6.3	3.7	34.5	0.31

Female #1 tunneled from under the shelter to the bottom of the soil and laid a second egg on 17 May. The first egg laid by this female remained on the soil surface and failed to hatch. Female #2 also dug a tunnel and laid three eggs on 18 May. Neither female accepted mealworms or crickets offered as food.

Observations of both females and their eggs were made through the transparent floor of the cages, or by carefully removing the shelters. Both females used their bodies to surround their eggs throughout incubation. Although they occasionally shifted their position within the tunnels, they remained under the soil and never appeared on the surface until their eggs hatched (see below).

When Female #1 was observed outside her tunnel on 27 June, we examined her egg and found a hatchling (Hatchling #1). Female #2 emerged from the soil on 8 July, whereupon we excavated three hatchlings (Hatchlings #2, 3, and 4), while Hatchling #4 was just struggling to extricate itself from its egg. Assuming that the females emerged upon the hatching of their eggs, as is the case of other congeneric species (e.g., *E. elegans*: Kato and Ota 1994), the incubation period of the second egg of Female #1 should be 41 days; the three eggs of Female #2 hatched in 51 days.

Various measurements of adult females and hatchlings are presented in Table 1. Although hatchlings were maintained in the enclosures in which they hatched, all died within three days.

Acknowledgments.—We thank H. Ota and J. Kato for reviewing the manuscript, and S.-L. Chen for collecting the lizards.

LITERATURE CITED

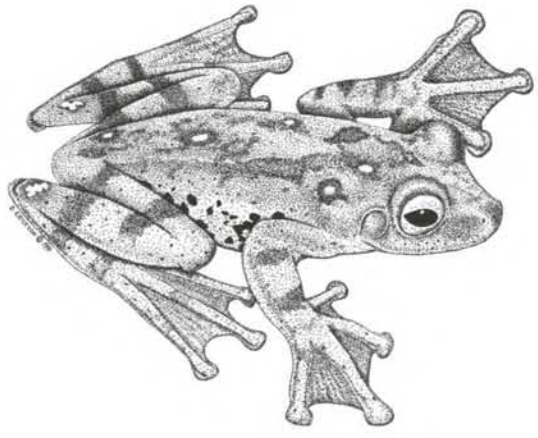
KATO, J., AND H. OTA. 1994. Notes on the breeding of the five-lined skink, *Eumeces elegans*. Acta Zool. Taiwan 5:77–81.

LIEB, C. S. 1985. Systematics and distribution of the skinks allied to *Eumeces tetragrammus* (Sauria: Scincidae). Nat. His. Mus. Los Angeles Co. Contr. Sci. 357:1–19.

PUNZO, F. 1982. Clutch and egg size in several species of lizards from the desert southwest. J. Herpetol. 16:414–417.

TANNER, W. W. 1957. A taxonomic and ecological study of the western skink (*Eumeces skiltonianus*). Great Basin Nat. 17:59–94.

TAYLOR, E. H. 1935. A taxonomic study of the cosmopolitan scincoid lizards of the genus *Eumeces*, with an account of the distribution and relationships of its species. Univ. Kansas Sci. Bull. 23:1–643.



Rhacophorus pardalis. Illustration by Dan Erickson.

NATURAL HISTORY NOTES

The Natural History Notes section is analogous to Geographic Distribution. Preferred notes should 1) focus on observations with little human intrusion; 2) represent more than the isolated documentation of developmental aberrations; and 3) possess a natural history perspective. Individual notes should, with few exceptions, concern only one species, and authors are requested to choose a keyword or short phrase which best describes the nature of their note (e.g., Reproduction, Morphology, Habitat, etc.). Use of figures to illustrate any data is encouraged, but should replace words rather than embellish them. The section's intent is to convey information rather than demonstrate prose. Articles submitted to this section will be reviewed and edited prior to acceptance. Send three copies of manuscripts, double-spaced, directly to the appropriate section co-editor (addresses on inside front cover): J. Brian Hauge (lizards, amphisbaenians, crocodilians, *Sphenodon*); Charles W. Painter (amphibians); or Paul A. Stone (snakes, turtles). Authors are requested to include a 3.5-inch disk containing pertinent files along with hard copy submissions. Indicate disk format (e.g., Macintosh, Windows), word processor name and version used to create the manuscript file, and include a text-only version of the file.

Standard format for this section is as follows: SCIENTIFIC NAME, COMMON NAME (for the United States and Canada as it appears in Collins (1997. *Standard Common and Current Scientific Names for North American Amphibians and Reptiles*, 4th ed., Herp. Circ. 25:1–40; for México as it appears in Liner 1994, *Scientific and Common Names for the Amphibians and Reptiles of Mexico in English and Spanish*, Herp. Circ. 23:1–113), KEYWORD. DATA on the animal. Place of deposition or intended deposition of specimen(s), and catalog number(s). Then skip a line and close with SUBMITTED BY (give name and address in full—spell out state names—no abbreviations). (NCN) should be used for common name where none is recognized. References may be briefly cited in text (refer to this issue for citation format).

Recommended citation for notes appearing in this section is: Lemos-Espinal, J., and R. E. Ballinger. 1994. *Rhyacosiredon leorae*. Size. Herpetol. Rev. 25:22.

CAUDATA

AMBYSTOMA GRACILE (Northwestern Salamander). **MAXIMUM SIZE.** On 10 February 1998, a neotenic female *Ambystoma gracile* was collected from a wetland bisected by 36th Avenue (T18N R2W NE 1/4 Sec 5), 43 m elev., west Olympia, Thurston Co., Washington, USA. As measured alive (chlorotone anesthetized), the specimen was 106 mm SVL (from tip of snout to anterior end of vent), 228 mm TL (Univ. Michigan FS05406). Leonard et al. (1993. Amphibians of Washington and Oregon. Seattle Audubon Society, Seattle, Washington. 168 pp.) reported the maximum size for neotenic *A. gracile* as ca. 85 mm SVL and 185 mm TL. Nussbaum et al. (1983. Amphibians and Reptiles of the Pacific Northwest. Univ. Idaho Press, Moscow. 332 pp.) reported paedogenetic larvae ranging from ca. 65–105 mm SVL, with the largest individuals being females.

We thank William P. Leonard for confirming the species identification. Funding was provided by the City of Olympia, Department of Planning and Development, Olympia, Washington.

Submitted by **CRIS HAGEN**, 708 Division Street NW, Olympia, Washington 98502, USA, and **CHRISTOPHER R. WILSON**, 4914 Sunset Drive NW, Olympia, Washington 98502, USA.

ANURA

ATELOPUS ZETEKI (Panamanian Golden Frog). **ATTEMPTED PREDATION.** The Panamanian golden frog, *Atelopus zeteki*, is a bufonid found in mid-elevation cloudforests of western-central Panama. The brilliant yellow-orange coloration and high skin toxicity of this frog has made it a prime example of an aposematic species (Duellman and Trueb 1986. Biology of Amphibians. McGraw Hill, New York. 670 pp.). Although snake predation on highly toxic amphibians has been well documented (Noble 1931. The Biology of the Amphibia. McGraw Hill, New York. 577 pp.; Myers et al. 1978. Bull. Am. Mus. Nat. Hist. 161:309-365), there are no records of predation by any species on *A. zeteki*. The following is a description of anti-predator behavior directed at snakes by this frog.

During field studies on this species at Parque Nacional Altos de Campana, Provincia de Panamá in June 1996, an aluminum pole (13 mm diam) was presented by EDL and TEH to three male *A. zeteki* sitting along a stream bank ca. 1 m from the water. All three males showed a dramatic response to this stimulus. Each frog immediately scrambled across the substrate from his original position, dove under water, and remained on the stream floor for up to 12 minutes. This response is in sharp contrast to the slow ambling observed when this species is disturbed by human observers. The marked response to the aluminum pole suggests that the animals were perceiving a potential snake predator.

On 5 December 1997, while making observations on a male *A. zeteki*, EDL and DDB witnessed a predation attempt by an adult snake (ca. 130 cm SVL; genus *Dendrophidion*). Our vantage point was the top of a waterfall looking down on the event and the animals. Our presence appeared to be undetected by the frog and the snake. The interaction was videotaped at 10X magnification on an 8 mm Nikon VN360. Before the encounter, the snake appeared to be actively foraging at the base of the waterfall in the vicinity of the golden frog, which was visible on top of a rock at the stream's edge. The snake was examining rock crevices above and below the water line. When the snake was ca. 10 cm from the frog, the frog moved slightly and the snake struck at the frog. The strike just missed the frog and it rapidly hopped to another rock two feet away from the snake and away from the stream. Then, the frog remained motionless while the snake searched in the immediate vicinity, without finding the frog. Ten minutes later, the snake climbed to a low branch overlooking the area, and remained motionless. At this point, we tried to catch the snake, but failed. Video identification of the genus was confirmed by Roberto Ibáñez of the Smithsonian Tropical Research Institute, Balboa, Panama. The *Dendrophidion* species present at Campana Heights are all very similar in appearance and include *D. nuchalis*, *D. percarinatum*, and *D. vinitor*.

We are grateful for the assistance of A. Stanley Rand, Roberto Ibáñez, César Jamarillo, Frank Solís, and Alberto Castillo. Financial support in part was provided through a Smithsonian Tropical Research Institute short-term graduate fellowship, a Columbus Zoological Park Conservation Fund Grant, a Grant-In-Aid-Of-Research award through Sigma Xi, The Scientific Research Society, and a Graduate School Alumni Research Award through The Ohio State University awarded to EDL.

Submitted by **ERIK D. LINDQUIST**, Department of Biology, Indiana University, 269 Jordan Hall, Bloomington, Indiana 47405, USA (e-mail: elindquist@bio.indiana.edu), **THOMAS E. HETHERINGTON**, Department of Zoology, The Ohio State University, 1735 Neil Ave., Columbus, Ohio 43210, USA (e-mail: hetherington.1@osu.edu), and **DANIEL D. BADGLEY**, Columbus Zoological Park, 9990 Riverside Drive, Box 400, Powell, Ohio 43065, USA (e-mail: dbadgley@colszoo.org).

BUFO MARINUS (Cane Toad). **ENDOPARASITES.** *Bufo marinus* was introduced into Guam from Hawaii in 1937 (Easteal

1981. Biol. J. Linn. Soc. 16:93–113). Herein we report on the helminths from a sample of 27 *B. marinus* (mean SVL 78 mm ± 15.4 SD, range 59–130 mm) collected during 1967, 1971, and 1976–97 from Guam, Mariana Islands. Toads were originally fixed in 10% formalin, later preserved in 70% ethanol, and deposited in the Natural History Museum of Los Angeles County (LACM 144222–144248). The body cavity was opened and the gastrointestinal tract was excised by cutting across the esophagus and rectum. The esophagus, stomach, small intestines, and large intestines were slit longitudinally and examined separately under a dissecting microscope. Each nematode was removed, placed in a drop of glycerol on a glass slide and identified. Trematodes were stained with hematoxylin, mounted in balsam and identified. Two helminths were present: the trematode, *Mesocoelium monas* (Rudolphi 1819), prevalence 52% (13/27); (number infected individuals divided by number of individuals examined) mean intensity 69.6 ± 90.6, range 1–300 (mean number parasites per infected host) and the nematode, *Rhabdias multiproles* Yuen 1965, prevalence 22% (6/27), mean intensity 10.3 ± 8.0, range 1–19. Helminths were deposited in the U.S. National Parasite Museum, Beltsville, Maryland as *Mesocoelium monas* (87755) and *Rhabdias multiproles* (87756). *Bufo marinus* is a new host record for *R. multiproles*.

We thank Richard D. Krizman for providing the sample of *B. marinus*.

Submitted by **STEPHEN R. GOLDBERG**, Department of Biology, Whittier College, Whittier, California 90608, USA, **CHARLES R. BURSEY**, Department of Biology, Pennsylvania State University, Shenango Campus, Sharon, Pennsylvania 16146, USA, and **SONIA HERNANDEZ**, Department of Biology, Whittier College, Whittier, California 90608, USA.

PSEUDACRIS TRISERIATA (Western Chorus Frog). **REPRODUCTION**. Few details on characteristics of chorus frog egg masses are published. Reported ranges of the number of eggs per cluster fall are 5–176 (Ruthven et al. 1928. The Herpetology of Michigan. Univ. Michigan Handbook Series. No. 3. ix + 229 pp.; Walker 1946. The Amphibians of Ohio. Part I. The Frogs and Toads. Ohio State Museum of Science. Bull. 1, No. 3. 1–109; Logier 1952. The Frogs, Toads and Salamanders of Eastern Canada. Clarke Irwin, Toronto. xii + 127 pp.; Vogt 1981. Natural History of Reptiles and Amphibians of Wisconsin. Milwaukee Public Museum. 205 pp.; Dundee and Rossman 1989. The Amphibians and Reptiles of Louisiana. Louisiana State Univ. Press. Baton Rouge. xi + 300 pp.). Vogt (*op. cit.*) reported that egg masses surround grass stems or twigs 7.5–20 cm below the water surface.

We observed recently deposited egg masses in a temporary pond (ca. 1.5 m maximum depth, 30 m^2 area), in savanna habitat at the Ojibway Prairie complex in Windsor, Ontario, Canada (42°25'N, 83°0'N) in late March 1996 (N = 32) and 1997 (N = 36), and early April 1998 (N = 127). Most masses were attached to dead grass stems (e.g., *Phragmites communis*), but some were attached to twigs (*Populus deltoides*, *Quercus palustris*, *Crataegus* spp.) at a mean ± SE water depth (to top of mass) of 11.8 ± 0.56 cm (range 0.5–37 cm). The mean ± SE number of eggs per mass was 63 ± 5.2 (N = 32, range 18–140).

Mean water depth (to top of mass) differed significantly among years (ANOVA, F2, 192 = 133.6, P<0.001) with depth in 1998 (15.8 ± 0.61 cm) being greater than either 1996 (5.3 ± 0.43 cm) or 1997 (3.7 ± 0.38 cm) (Ps<0.001). Differences in depth among years appeared to be related to the amounts of infiltration and/or runoff resulting from precipitation during or after oviposition. In 1998, 41 mm of rain fell in a 24 h period at the site three days prior to our visit. The pond nearly crested its bank and the water depth covering the egg masses increased. The mean depths for 1996 and 1997 would be closer to the actual oviposition depths selected by *P. triseriata* judging by our observations of amplexing pairs. Changing water levels after oviposition would potentially influence larval success by affecting desiccation stress and/or UV-B penetration.

Submitted by **STEPHEN J. HECNAR**, Department of Zoology, University of Guelph, Guelph, Ontario N1G 2W1, Canada, and **DARLENE R. HECNAR**, 74 Janefield Ave, Suite 50, Guelph, Ontario N1G 2L6, Canada.

SCINAX ELAEOCHROA (NCN). **PREDATION**. *Scinax elaeochroa* occurs through the Caribbean lowlands from Nicaragua to western Panama, and in the Pacific lowlands of the Golfo Dulce regions in Costa Rica and Panama (Frost 1985. Amphibian Species of the World. Allen Press, Lawrence, Kansas. 732 pp.). On 7 July 1997 at ca. 2300 h, we observed several amplectant pairs of *S. elaeochroa* in a research swamp at La Selva Biological Station, 32 m elev., Heredia Prov., Costa Rica. At 2330 h a male cat-eyed snake (*Leptodeira septentrionalis*), which obviously contained a prey item, was captured near the edge of the swamp.

A sexual pair of *S. elaeochroa*, which had been consumed head first, were palpated from the digestive tract of the *L. septentrionalis*. Although dead, the frogs were still in an amplectant position. After observing several pairs of *S. elaeochroa*, it was noted that the males typically situated their heads around the mid to upper dorsum of the female during amplexus. It would be difficult, if not impossible, for an adult *L. septentrionalis* to restrain both frogs upon first strike. Therefore, it appeared that despite the instant threat of predation the male *S. elaeochroa* did not release his grasp from the female when the snake began feeding.

Submitted by **MATTHEW J. RUSSELL**, Department of Herpetology, Dallas Zoo, 650 South R.L. Thorton Freeway, Dallas, Texas 75203, USA, **MAURA AMPLE**, Department of Biology, Indiana University, Bloomington, Indiana 47405, USA, and **ANN STRIEBY**, Department of Biology, California State University, 18111 Nordhoff Street, Northridge, California 91330, USA.

CROCODYLIA

CAIMAN LATIROSTRIS (Broad-snouted Caiman). **BEHAVIOR.** Tail display is relatively common in vertebrates, but is expressed most dramatically and variably in reptiles. Tail display has been described as an aggressive social behavior in adult males of *Caiman crocodilus crocodilus* during the reproductive period, occurring prior to frontal attack (Azarzaguena 1983. Doñana Acta Vert. 10[3]:1–136). During this display the animal keeps its head and distal portion of the tail arched above the surface of the water. Some head movement may be associated, but this is infrequent.

The same aggressive tail display was directed at me on many occasions by adult (SVL ≥ 75 cm), captive broad-snouted caimans (*C. latirostris*) of both sexes. The display differed in that, after arching their tails above the water, the caimans slowly moved their bodies approximately 45° in relation to the observer, then rotated back to the original frontal position, prior to attack. Frontal attacks would be expected to be faster and more efficient that lateral ones, during which animals would be more vulnerable to counterattack on their flanks. Why, then, does *C. latirostris* apparently compromise its efficiency by turning prior to attack?

One hypothesis is that this position may allow utilization of the tail during attack, but this has never been observed, other than in tail splashing prior to approaching an opponent. Oblique or lateral attacks have never been described. Another possibility may be that the tail acts to distract the opponent from the animal's main weapon, its mouth. If this is true, however, it does not explain why the animal does not rotate a full 90°, which would theoretically maximize the efficiency of the distractive behavior by placing the head and mouth as close to the opponent as the tail.

Perhaps two opposing selective pressures are acting on the same behavior. A frontal position relative to the opponent would favor the attack itself, but would minimize the effect of distractive tail movements. A perpendicular position would maximize distractive effects, but would reduce attack efficiency, as the animal would have to rotate 90° back to the frontal position before attacking. The observed behavior in *C. latirostris* could be the geometric resolution of these two apparently equal selective pressures.

Considering caiman head and tail morphology, tail distractive behavior may be visually efficient only when an opponent's eyes are at water level. It is doubtful that this behavior is part of an elaborate feeding strategy, as caimans are known to be opportunistic predators, and it is unlikely that they developed such complex behavior that would only be of benefit in pursuit of specific prey. Adult crocodilians have almost no natural predators besides humans, and, because tail display in caimans is exhibited only by adults, this behavior is apparently not related to predator defense. By exclusion, the most likely use of tail distractive behavior in caimans is in intraspecific social interactions. Tail displays described by Ayarzaguena (in lit.) for *C. crocodilus crocodilus* dur-

ing reproductive season seem to corroborate this hypothesis.

Submitted by **LUCIANO M. VERDADE**, Departamento de Zootecnia/ESALQ, Universidade de São Paulo, C.P. 09 Piracicaba, São Paulo 13418-900, Brazil.

TESTUDINES

CHELYDRA SERPENTINA (Common Snapping Turtle). **AGGRESSION**. There is an on-going debate about the existence of territoriality in the common snapping turtle (*Chelydra serpentina*). Some researchers have found extensive home range overlap among males (Galbraith et al. 1987. Can. J. Zool. 65:2623–2629), and no evidence of territoriality or aggression (Obbard and Brooks. 1981. Copeia 1981:630–637). Others believe that snapping turtles frequently exhibit intraspecific aggression by defending feeding areas or more simply their immediate surroundings (Kiviat 1980. Trans. Northeast Sect. Wildl. Soc. 37:158–168).

On 28 July 1996, we observed *Chelydra serpentina* biting at the sides of a turtle trap in Grafton Lake, Kejimkujik National Park, Nova Scotia, Canada. Based on their large size, we assumed that both turtles were adult males. For 10 min the turtles chewed at different parts of the trap; each apparently unaware of the other. Both turtles submerged and resurfaced periodically until, at one point they surfaced facing each other ca. 30–40 cm apart. At this point, there was a short (ca. 45 sec) but violent confrontation, with carapaces raised out of the water several times. At the fight's conclusion, one turtle remained near the trap and the second turtle surfaced ca. 40 m from the trap. On inspection the trap was found to contain a live common sucker (*Catostomus commersoni*).

This behavior was similar to an observation made the previous day while radio-tracking two adult males in another part of the lake. For over an hour, the two turtles moved closer to one another, until at one point they were 0.75 m apart. Subsequent tracking five min later revealed that one turtle was still at the site while the other had moved ca. 35 m away. Our unpublished data suggest that snapping turtles, during this time of day (1200 h), generally do not move long distances in such short periods of time. As a result, we suspect that this sudden movement was the result of a confrontation between the two turtles.

These two observations indicate that aggression between snapping turtles does occur. More data are needed before conclusions about the presence/absence of territoriality in this species can be made.

We thank the many participants in the Grafton Watershed Ecological Restoration Monitoring Project, and the staff of Kejimkujik National Park. Support was provided by the Ecosystem Monitoring Fund (Parks Canada) and the Acadia Centre for Wildlife and Conservation Biology.

Submitted by **DONNA D. HURLBURT**, **STEPHEN MOCKFORD**, and **THOMAS B. HERMAN**, Centre for Wildlife and Conservation Biology, Acadia University, Wolfville, Nova Scotia, Canada BOP 1XO; e-mail (TBH): tom.herman@acadiau.ca.

CLEMMYS MUHLENBERGII (Bog Turtle). **OVIPOSITION SITE**. Most *Clemmys muhlenberii* nesting sites have been located within elevated sedge tussocks or sphagnum moss above the water line. However, documented oviposition sites also include the soft soil above springs, adjacent pastures, and the sides of railroad embankments (Ernst et al. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, DC. 578 pp.). On 21 July 1997, a clutch of three eggs (length x width = 30.81 mm x 15.88 mm, 31.42 mm x 15.97 mm, 30.19 mm x 15.85 mm), presumed to be *C. muhlenbergii*, was found ca. 6 cm deep in the top of a rotten, unidentifiable, hardwood stump. The stump, which was partially covered by mosses and poison ivy (*Toxicodendron radicans*), stood ca. 45 cm above the ground and was ca. 35 cm in diameter. All three eggs were collected and incubated at home by one of us (KMF). On 27 August 1997, one of the eggs hatched, confirming their identity as *C. muhlenbergii*. We believe this is the first reported use of a stump for nesting by *C. muhlenbergii*. The remaining two eggs never fully developed and began to rot. The surviving hatchling (30.19 mm CL, 34.41 mm CW; UGAMNH 44225 photo voucher) was released 28 March 1998 at the site of collection.

The collection site, Wolf Creek Bog (Chattahoochee National Forest, Union County, Georgia, USA), was first confirmed to be inhabited by *C. muhlenbergii* in 1979 (Hale and Harris 1980. Herpetol. Rev. 11:14). This bog site has been slowly succeeding to a more closed canopied hardwood forest. As a result, there is increasingly limited sedge and sphagnum moss areas in which to nest, potentially forcing *C. muhlenbergii* at this site to seek alternative oviposition areas. U.S. Forest Service personnel have begun management to reduce the hardwood encroachment and thus open up the canopy. This represents the first recorded nesting of *C. muhlenbergii* in Georgia.

We thank Jim and Cindy Wentworth of the U.S. Forest Service for their dedication to bog turtle conservation within the Chattahoochee National Forest.

Submitted by **KENNETH M. FAHEY**, 439 Pinewood Drive West, Dahlonega, Georgia 30533, USA, and **JOHN B. JENSEN**, Georgia Department of Natural Resources, Nongame Endangered Wildlife Program, 116 Rum Creek Drive, Forsyth, Georgia 31029, USA (e-mail: john_jensen@mail.dnr.state.ga.us).

DERMOCHELYS CORIACEA (Leatherback Sea Turtle). **ACCIDENTAL CAPTURE**. Records of *Dermochelys coriacea* on the Brazilian coast are rare (Bellini and Sanches 1998. Marine Turtle Newsltr. 79:22; Menezes 1972. Arq. Ciênc. Mar. 12:17–20; Moreno et al. 1994. Anais do II Encontro Sobre Coordenação de Pesquisa e Manejo da Franciscana. Ed. da FURG, Florianópolis, Brasil. 88 pp.). Two leatherback turtles were accidentally caught during fishery prospection near Saint Paul's Rocks, using a 28,000 m oceanic longline with 600 hooks baited with Brazilian sardines (*Sardinella brasiliensis*). A dead juvenile *D. coriacea* of undetermined sex was boarded on 18 October 1996. It measured 40 cm CCL (curved carapace length) and was caught at 180 m depth (00°46'S, 33°18'W). The specimen was photographed onboard and soon thrown overboard. A living adult (CCL = 180 cm) was caught on 19 October 1996. It was probably a female, based on the absence of a long tail, and was at 130 m depth (01°40'S, 33°36'W). The latter, while being boarded, showed a behavior similar to that described by Engrid et al. (1992. Herpetol. Rev. 23:70–71), swimming in wandering movements (zigzag) on its backside. Due to its great size, it could not be boarded, but was instead photographed in the water and released. Color slides of this turtle are on file in the Museu de História Natural, Universidade Estadual de Campinas (no catalog number). These are the northernmost records of the leatherback sea turtle in the Western South Atlantic. Apparently, sea turtle captures in this type of fishery are more common than reported. Artisanal fishermen from the Praia de Itapoã, Salvador, Bahia State (pers. comm. to C. L. S. Sampaio) and from several sites of southern Espirito Santo state (pers. comm. to J. L. Gasparini) report frequent captures of *D. coriacea.*

Many thanks to Ellen Wang and Sérgio R. Floeter for the English version, I. Sazima and J. L. Gasparini for comments on the manuscript, Renato B. Paglerani for colors slides and information about accidental captures, and CNPq for financial support.

Submitted by **CLÁUDIO LUIS S. SAMPAIO**, Universidade Federal da Bahia, Instituto de Biologia, Campus Universitário de Ondina, CEP 40.170-110, Salvador, Bahia, Brazil. Present address: Av. Sete de setembro, 2141/101, Edf. Caiçara, CEP 40.080-002, Salvador, Bahia, Brazil; e-mail: sampaio@ufba.br.

GOPHERUS AGASSIZII (Desert Tortoise). **PREDATION.** A variety of predators, most notably coyotes (*Canis latrans*) and common ravens (*Corvus corax*), have been reported to prey on hatchling desert tortoises, *Gopherus agassizii* (Ernst et al. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, D.C. 578 pp.). Here, we report an observation of a hatchling tortoise, fitted with a radiotransmitter, that was preyed upon by native fire ants (*Solenopsis* sp.) in the eastern Mojave Desert at Yucca Mountain, Nevada (36°50'N, 116°25'E). On 27 August 1993, we found a live, 5 day-old *G. agassizii* (45 mm carapace length) with the eyes, chin, and parts of the head and legs being eaten by ants. The tortoise was lethargic and responded little when touched. The ants were removed, and the tortoise was released near the site of capture. When relocated the next day, the tortoise was dead. This specimen was deposited at University of California at Berkeley, Museum of Vertebrate Zoology (MVZ 223521). Eight of 74 other radiomarked hatchlings (aged 3–7 days) that we monitored during 1992–1994 were found dead with fire ants scavenging the carcasses. We do not know if the ants preyed on these tortoises or if the ants were simply scavenging the carcasses. Five of these specimens were deposited at MVZ (223522, 223524, 223532, 223535–36). Although imported fire ants (*S. invicta*) have long been known to kill hatchling gopher tortoises, *G. polyphemus* (Mount 1981. J. Alabama Acad. Sci. 52:71–78), native fire ants have not been implicated previously as predators of desert tortoises.

Tortoises were handled under permits PRT-683011 and PRT-781234 from the U.S. Fish and Wildlife Service, and S-0446, S-1595, S-3108, S-5041, S-6941, and S-9060 from the Nevada Division of Wildlife. This research was supported and managed by the U.S. Department of Energy, Yucca Mountain Site Characterization Office, as part of the Civilian Radioactive Waste Management Program under contracts DE-AC08-88NV1067, DE-AC08-93NV11267, DE-ACO1-91RW00134, and DE-ACO8-91RW00134.

Submitted by **JAMES L. BOONE**, **DANNY L. RAKESTRAW**, and **KURT R. RAUTENSTRAUCH**, Science Applications International Corporation (SAIC), 1180 Town Center Drive, Las Vegas, Nevada 89134, USA (e-mail for JLB: jim_boone@ymp.gov).

GOPHERUS POLYPHEMUS (Gopher Tortoise). **SCAVENGING.** *Gopherus polyphemus* is an obligate grazer (Garner and Landers 1981. Proc. Conf. Southeast Assoc. Fish Wildl. Agencies 35:120–134; Macdonald and Mushinsky 1988. Herpetologica 44:345–353). Reports of carnivorous scavenging by this species are extremely rare (Garner and Landers, *op. cit.*; Anderson and Herrington 1992. Herpetol. Rev. 23:59). At 1400 h on 3 September 1997, DRJ observed a small adult or subadult gopher tortoise (15 annuli, CL 178 mm, PL 173 mm) scavenging the dry, flattened carcass of a great-horned owl (*Bubo virginianus*) on the edge of Georgia highway 33, 20 km north of Sylvester, Worth County, Georgia, USA. The activity took place in full sun at 33°C, with the tortoise ignoring occasional passing traffic. When handled, the tortoise voided a brownish urine. A voucher slide (UF 113440) has been deposited in the photographic archive of the Herpetology Collection, Florida Museum of Natural History.

In June 1992, TEO observed a juvenile gopher tortoise (130 mm CL) energetically consuming the dried remains of a road-killed armadillo (*Dasypus novemcinctus*) on US highway 19 in Citrus County, Florida, USA, near Crystal River. Old field and native upland pine habitats occurred at both the Georgia and Florida sites.

Scavenging of dried vertebrate remains may facilitate acquisition of minerals, such as calcium and phosphate, that often are poorly represented in the leached, sandy soils typically occupied by this herbivorous turtle (Garner and Landers, *op. cit.*). Our observations underscore the use of this foraging component by demographic groups other than mature females, the group emphasize by Garner and Landers (*op cit.*). In addition to the tortoise's propensity for living along roadsides, which facilitates its collection by humans for food or pets, feeding upon road-killed vertebrates may contribute directly to mortality (from automobile impact) of this already declining species.

We thank Todd Engstrom for identification of the owl carcass.

Submitted by **DALE R. JACKSON**, Florida Natural Areas Inventory, 1018 Thomasville Road, Suite 200-C, Tallahassee, Florida 32303, USA (e-mail: djlcmlcm@aol.com), and **THOMAS E. OSTERTAG**, Department of Biological Sciences, Southeastern Louisiana University, Hammond, Louisiana 70402, USA.

TERRAPENE ORNATA LUTEOLA (Desert Box Turtle). **ATTEMPTED PREDATION.** A wide variety of predators, including birds, are known or suspected of eating eggs or young of turtles (Legler 1960. Univ. Kansas Publ., Mus. Nat. Hist. 11:527–669; Walley 1993. Herpetol. Rev. 24:148–149; Ernst et al. 1994. Turtles of the United States and Canada. Smithsonian Inst. Press, Washington, DC. 578 pp.). Predation on adults is less common, although large mammals like coyotes (*Canis latrans*), raccoons (*Procyon lotor*), and skunks (several species) might be capable of killing adults of some species (Harding 1997. Amphibians and

FIG. 1. Photograph taken October 1988 indicating shell damage on a female *Terrapene ornata luteola* inflicted by a turkey vulture (*Carthartes aura*).

FIG. 2. New epidermal material covering the damaged shell in July 1998.

Reptiles of the Great Lakes Region. The University of Michigan Press, Ann Arbor. 378 pp.). Birds are rarely considered predators of adult turtles, although two gulls (*Larus* sp.) attacked an adult *Malaclemys t. terrapin* (Watkins-Colwell and Black 1997. Herpetol. Rev. 28:87–88) and severely damaged the turtle's limbs.

On 3 October 1988 at 1826 h, I saw a turkey vulture (*Carthartes aura*) standing on an adult *Terrapene ornata luteola* on a dirt road in the Sevilleta National Wildlife Refuge, ca. 85 km south of Albuquerque, New Mexico, USA. From a distance I could see the vulture using its beak on the carapace of the turtle. I watched the interaction for ca. 1 min before driving up to the pair. As I drove up, the bird flew off. The turtle had both ends of its plastron shut tightly. The turtle was a female (128 mm carapace length, 480 g) that I had marked in August 1987. At that time, there was no damage to the carapace of the turtle. The carapace was now damaged, and judging from the behavior of the vulture and the fresh appearance of the damage, it seems likely that the damage was caused by the vulture. The vulture had apparently scraped off epidermal lamellae down to bone in one contiguous area on the right front of the carapace (Fig. 1). Although bone was exposed, the turtle did not seem to be seriously injured otherwise. Florida box turtles (*T. carolina bauri*) can survive extensive loss of epidermal material due to fire (Dodd 1997. Herpetol. Nat. Hist. 5:66–72). I do not know how much more damage could have been inflicted on the turtle if the vulture had not flown off when I approached.

I found the turtle again on 9 July 1998 while resurveying the population on the Sevilleta NWR. The damaged area of the shell had completely healed over with new epidermal material (Fig. 2). In addition, this female was carrying two eggs, a further indication of no lasting harm due to the attack.

Submitted by **DAVID J. GERMANO**, Department of Biology, California State University, Bakersfield, California 93311, USA (e-mail: Dgermano@csubak.edu).

LACERTILIA

GALLOTIA SIMONYI MACHADOI (Hierro Giant Lizard). **UNDESCRIBED BEHAVIOR.** The Hierro giant lizard is a diurnal, heliothermic, large lacertid (≤ 226 mm SVL) presently threatened with extinction, as the only remaining population, about 1600 individuals (Rodríguez-Domínguez, unpubl. data), is located in the small overhang of a cliff in the northeastern part of El Hierro Island (Canary Islands). Information regarding reproduction of the species is limited (Rodríguez-Domínguez and Molina-Borja 1998. J. Herpetol. 32:498–504).

The Canary government keeps 57 adult lizards in captivity, six of them captured from the natural habitat, at the Recovery Center for the Hierro giant lizard; they have been the progenitors for a breeding program that began in 1985. Here I report on previously unknown homosexual behavior between males, long-term sperm storage by females, and of the presence of coagulated material on the hemipenes and cloacas of some males and females. None of these features has been previously reported for *Gallotia*.

Observations were made through a blind in a large outdoor terrarium; the observer was 2–7 m from the animals. On 16 July 1997, I introduced four males of similar sizes and allowed them to interact freely. The largest male (226 mm SVL, 357 g mass), throat inflated and performing headbobs, approached another male (207 mm SVL, 288 g mass). The larger male bit the other's neck skin and attempted to insert one of his hemipenes into the other's vent. During that time, the second male struggled and exhibited nervous, vertical head shakings. Finally, the dominant male rubbed the other's back with his hemipenis. The lizards then became aware of the observer's presence and immediately separated and retreated. I saw remains of small stones in the center of the hemipenis's lobe that certified that the organs were everted.

On the other hand, I observed successful hatching of eggs laid by females that had been maintained in terraria without males for one year, indicating that *Gallotia simonyi* females may store living sperm and that fertilization need not immediately follow copulation. These females (N = 10) were born in captivity (mean SVL 184.9 mm, SD 1.9, range 165–192 mm), and included one six-year-old, one eight-year-old, and seven nine-year-old individuals. Clutches were produced from 25 June to 15 July 1997 (mean clutch size 4.11, SD 0.86); however, out of 37 eggs, only five live young hatched, one of which had a malformed backbone and an occluded eye.

During the reproductive period, four males exhibited a coagulated white secretion in the center of one or both lobes of the hemipenes. This material also was observed in the cloacas of two females. Although its appearance is very similar to the mating plugs that have been described in females of some snakes (Devine 1977. Nature 267:345–346), I cannot presently tell if this material has the same composition and function, i.e., to discourage copulation by other males.

I thank Miguel Molina-Borja from the Dpto. de Biología Animal, Facultad de Biología, Universidad de La Laguna (Tererife) and an anonymous reviewer for reviewing the original manuscript.

Submitted by **MIGUEL ANGEL RODRÍGUEZ-DOMÍNGUEZ**, Centro de Reproducción del Lagarto Gigante de El Hierro, Frontera 38911, El Hierro, Canary Islands, Spain (e-mail: marodri@iic.vanaga.es).

HEMIDACTYLUS TURCICUS (Mediterranean Gecko). **PREDATION**. On 1 September 1997 we collected a young *Hemidactylus turcicus* (0.45 g, 27.8 mm SVL, 34.8 mm TL; UTA R-43562) and an adult female comb-footed spider *Tidarren sisyphoides* (6.9 mm cephalothorax and abdomen length) in its web. The web was discovered on the bottom of an office table within the Bird and Reptile Building at the Dallas Zoo, Dallas County, Texas, USA. The web also contained five spider egg cases, four of which were empty and one that was hatching. When found, the spider was actively feeding on the tip of the mandible of the gecko but retreated when disturbed. The Theridiidae, or comb-footed spiders, build irregular webs and cast viscous silk over their prey. They are known to prey on small lizards (Blondheim and Werner 1989. Brit. Herpetol. Soc. Bull. 30:26–28; McCormick

and Polis 1982. Biol. Rev. 57:29–58; Welter and Fauth 1996. Herpetol. Rev. 27:79) and to subdue prey many times their own size.

Submitted by **DAVID T. ROBERTS** and **RUSTON W. HARTDEGEN**, Dallas Zoo, Department of Herpetology, 650 South R.L. Thornton Freeway, Dallas, Texas 75203-2996, USA, and **DANIEL FORMANOWICZ**, Department of Biology, University of Texas at Arlington, Box 19498, Arlington, Texas, 76019, USA.

LACERTA LEPIDA (Ocellated Lizard). **NECROPHAGIA and OOPHAGIA**. Necrophagia and the consumption of bird eggs are known among large saurian species; however we have found only one explicit reference indicating necrophagia in *Lacerta lepida* (Calderón 1977. Doñana, Act. Vert. 4:61–126) and another implicit one (Hódar et al. 1996. J. Arid Env. 33:95–107). Oophagia in this species has been documented in analyses of the digestive tract and feces (Calderón 1977. *op. cit.*), but as *L. lepida* does not normally ingest eggshells (De Juana and De Juana 1982. Doñana, Act. Vert. 9:374–375), evidence of oophagia may have been overlooked.

On 15 May 1986, at 1300 h, near Constantina (Seville, Spain, UTM 30s TG6995), we observed an adult male *L. lepida* devouring vitellogenic follicles and fat bodies of a recently-roadkilled female conspecific. On 29 May 1986 at 1730 h near the Sanctuary of the Virgen de la Cabeza (Jaén, UTM 30s VH1126), and again on 5 July 1986 at 1010 h in El Dornajo (Granada, UTM30s VG6108), we found an adult *L. lepida* feeding on an adult male Montpellier snake, *Malpolon monspessulanus* (SVL of male 1250 mm, of female 602 mm, respectively), also recently roadkilled. On 20 March 1987 in Tobazo (Jaén, UTM 30s VG0956), we found a roadkilled adult male *L. lepida* with the remains of a female ladder snake, *Elaphe scalaris* (860 mm SVL), in its mouth.

On the sandy escarpment of the palaeocanal of the River Guadalete (C·diz, UTM 30s TF6584), was a small nesting colony of bee-eaters (*Merops apiaster*) with 11 occupied nests. On 6 May 1997 at 1800 h we saw an adult female *L. lepida* emerge from one of the nests with an egg in its jaws. At the entrance of the nest hole, the lizard broke open the egg, devoured the contents and discarded the shell. The lizard re-entered the nest hole, emerged with another egg and repeated the action. Afterwards, the lizard moved over the escarpment and entered a second nest, and this time emerged with a recently-hatched Bee-eater chick; at the entrance of the nest the chick was rapidly swallowed. After ingesting another egg from a third nest, the lizard fled.

Submitted by **JUAN M. PLEGUEZUELOS, SANTIAGO HONRUBIA**, Departamento de Biología Animal y Ecología, Facultad de Ciencias, Universidad de Granada, 18071 Granada, Spain (e-mail: juanple@goliat.ugr.es), and **JOSÉ A. MATEO**, Estación Biológica de Doñana, Avenida María Luisa s/n, 41013 Sevilla, Spain.

SCELOPORUS OCCIDENTALIS LONGIPES (Great Basin Fence Lizard). **PREDATION**. Although birds such as raptors, corvids, cuckoos, and shrikes are well-known predators of reptiles (Terres 1991. The Audubon Society Encyclopedia of North American Birds. Wings Books, New York. 1109 pp.), observations of predation in the wild are relatively scarce. On 23 February 1998, at east Lake Hodges, San Diego County, California, USA (33°03'45"N, 117°03'45"W; elev. 98 m), we observed an adult male great-tailed grackle (*Quiscalus mexicanus*) attack and consume two adult male *Sceloporus occidentalis longipes*. The grackle was perched near shore, searching for prey on a floating western cottonwood (*Populus fremontii*) branch when the first lizard was seized at 0830 h. The lizard was carried about 10 m to a small stand of cat-tail (*Typha angustifolia*) and willow (*Salix* sp.), where the tail and visceral contents were consumed first, followed by the remainder of the lizard's body. Shortly thereafter, at the same feeding site, the grackle seized a second lizard in a clump of dead cat-tails, flew about 50 m to a cottonwood, and again consumed tail and viscera first, followed by head and body.

The winter 1997–98 flooding of Lake Hodges and surrounding riparian woodland has displaced *S. o. longipes* to tree perches and floating vegetation (C. Mahrdt, pers. obs.), greatly exposing this species to avian predators. Although natural predators of *S. occidentalis* include birds and several colubrid snakes (Bell and Price 1996. Cat. Amer. Amphib. Rept. 631.1–631.17; Fitch 1940. Univ. California Publ. Zool. 44:151–172), apparently this is the first reported observation of a great-tailed grackle preying on a western fence lizard.

We thank Kent Beaman for his comments and review of the manuscript.

Submitted by **CLARK R. MAHRDT**, Herpetology Department, San Diego Natural History Museum, P.O. Box 1390, San Diego, California 92112, USA, and **RICHARD L. BARBER**, Palomar Audubon Society, 15569 Walton Heath Row, San Diego, California, USA.

SCELOPORUS VIRGATUS (Striped Plateau Lizard). **PREY**. Although *Sceloporus virgatus* is a relatively well-studied lizard, little is known about its diet beyond that fact that it is insectivorous. I report an attempted predation event by *S. virgatus* on a potentially dangerous prey item, a centipede (species unknown), in a wooded area of a study site in the Chiricahua Mountains (1600 m elev.), approximately 2.5 km SW Southwestern Research Station, Portal, Cochise County, Arizona, USA (see Smith 1996. Amer. Midl. Nat. 135:68–80). On 7 June 1993 I observed a female *S. virgatus* (SVL 53 mm) attack and attempt to consume a relatively large centipede (30–40 mm). The predation attempt by the lizard was unsuccessful, and involved a highly violent interaction, ending when the female released the centipede. The latter subsequently escaped.

Submitted by **GEOFFREY R. SMITH**, Department of Biology, William Jewell College, 500 College Hill, Liberty, Missouri 64068, USA.

TUPINAMBIS MERIANAE (Common Tegu). **ACTIVITY.** Although the genus *Tupinambis* is widely distributed in South America east of the Andes, with species occurring along many ecosystems (Ávila-Pires 1995. Lizards of Brazilian Amazonia [Reptilia: Squamata]. Nationaal Natuurhistorisch Museum, Leiden, The Netherlands. 706 pp.), information on their activity based on field data is scarce. *Tupinambis merianae* occurs in many Brazilian environments such as cerrado, caatinga, and the Atlantic forest. In an area of Atlantic Rainforest at Ilha Grande (23°11'S, 44°12'W), Rio de Janeiro, southeastern Brazil, *T. merianae* is the most abundant species of lizard. Field work was carried out at two sites, (1) a relatively undisturbed forest and, (2) a 30-yr-old regenerated forest. During transects carried out at both sites between January and December 1996, it was common to see and hear active individuals of *T. merianae* foraging and basking, mainly at sunny patches in the forest. The transects were always done between 0700 h and 1700 h. Each time we detected a lizard, we recorded the date and time. The lizards were active between

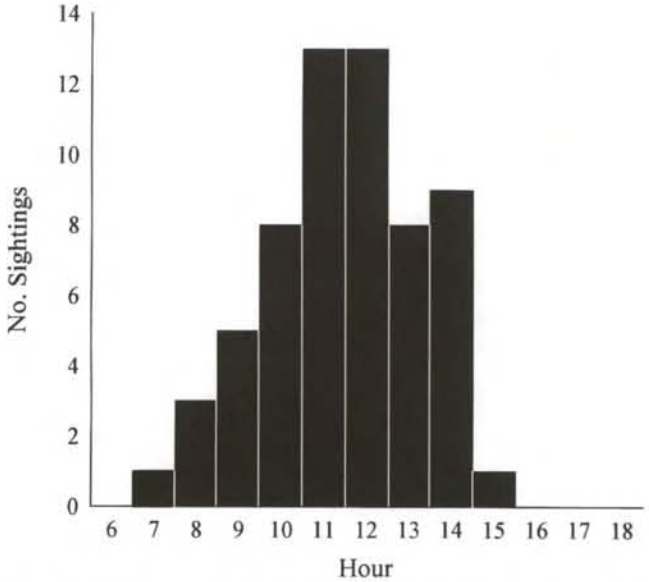


FIG. 1. Daily activity of *Tupinambis merianae* in the Atlantia rainforest of Ilha Grande, Rio de Janeiro, between January and December, 1996.

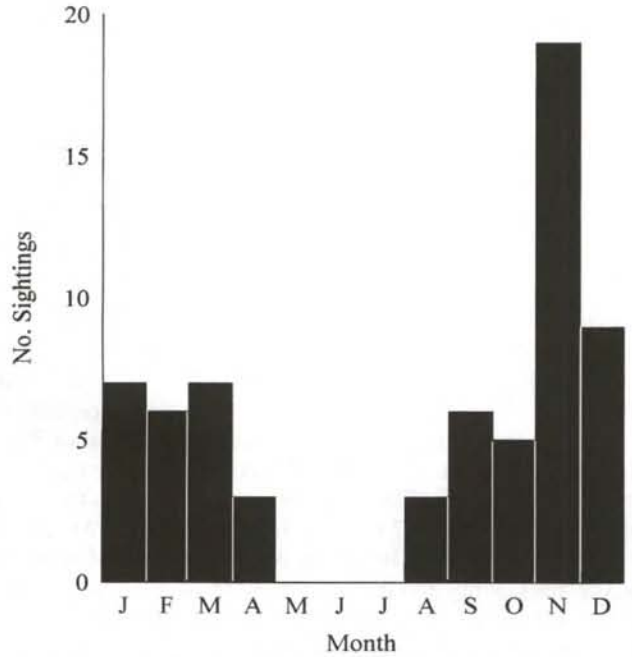


FIG. 2. Number of active *Tupinambis merianae* each month.

0700 h and 1500 h. Daily activity was unimodal, being highest during the hottest period of the day (1100–1300 h, Fig. 1). Yearly activity peaked during November; there was a period of aestivation between May and July (Fig. 2). This pattern of activity is similar to that of *T. teguixin*, at Serra do Japi, an area of Atlantic Rainforest in the State of São Paulo (Sazima and Haddad 1994. *In* Morellato (ed.), História Natural da Serra do Japi, pp. 212–236. EDUNICAMP/FAPESP, Campinas, São Paulo, Brazil). It is also similar to that of two Argentinian species, *T. teguixin* and *T. rufescens*, which overwinter in burrows and become active in September and October (Fitzgerald et al. 1991. *In* Robinson and Redford [eds.], Neotropical Wildlife: Use and Conservation, pp. 303–316. University of Chicago Press, Chicago, Illinois). These species also have a peak of activity during the spring, mainly during November and December (Fitzgerald et al. 1994. Interciencia 19:166–170).

Support was provided by CNPq grant No 301 117/95-0 (MV) and CNPq grant No 300 819/94-3 (CFDR).

Submitted by **MONIQUE VAN SLUYS** (e-mail: vansluys@uerj.br) and **CARLOS FREDERICO DUARTE ROCHA**, Setor de Ecologia, Instituto de Biologia Roberto Alcántara Gomes, Universidade do Estado do Rio de Janeiro, Rua São Francisco Xavier 524, Maracaná, Rio de Janeiro, 20550-013, Rio de Janeiro, Brazil.

SERPENTES

CLELIA CLELIA (Mussurana). **ATTEMPTED PREDATION.** *Clelia clelia* is a rear-fanged colubrid found at low to moderate elevations from southern Mexico to Argentina. It occurs in all but the driest lowland areas of Costa Rica. Ophiophagy has been well documented in this species, but few observations have been made in the wild (Scott 1983. *In* D.H. Janzen [ed.], Costa Rican Natural History, pp. 392. University of Chicago Press, Chicago, Illinois.).

On 8 July 1997 at 0130 h, we discovered a juvenile *C. clelia* attempting to eat a subadult *Leptodeira septentrionalis* (cat-eyed snake). This observation was made near the edge of a research trail at the La Selva Biological Station, Heredia Province, Costa Rica (32 m elev.). Photographs were taken immediately and 12 minutes of observation followed (Fig. 1). During this time, we sat on the trail with our flashlights dimmed ca. 3 m from the location of the snakes. The *C. clelia* was successively biting at the nuchal region of the *L. septentrionalis* while constricting the anterior and midbody with four tight coils. After 12 minutes, the *C. clelia* aborted the attempted predation and retreated. Surprisingly, despite probable envenomation and suffocation, the *L. septentrionalis* was not immobilized and made a rapid escape. Due to its swift retreat, we could not capture the *L. septentrionalis* for measurements. However, it can be safely stated that the *L. septentrionalis* was greater in length than the *C. clelia*, but not in circumference. The *C. clelia* measured 61.9 cm SVL, 74.9 cm total length, and weighed 68.8 g.

Submitted by **MATTHEW J. RUSSELL**, Department of Herpetology, Dallas Zoo, 650 South R.L. Thornton Freeway, Dallas, Texas 75203, USA, **MAURA MAPLE**, Department of Biology, Indiana University, Bloomington, Indiana 47405, USA, and **ANN**

FIG. 1. Attempted predation of a sub-adult *Leptodeira septentrionalis* by a juvenile *Clelia clelia*.

STRIEBY, Department of Biology, California State University, 18111 Nordhoff Street, Northridge, California 91330, USA.

CROTALUS ATROX (Western Diamondback Rattlesnake). **MORPHOLOGY**. Klauber (1972. Rattlesnakes. Their Habits, Life Histories, and Influence on Mankind. Univ. California Press, Berkeley, California. 740 pp.) reported the congenital absence of rattles in three species of rattlesnakes, *Crotalus cerastes*, *C. horridus*, and *C. pricei*. A rattleless form of *C. ruber lorenzoensis* is well established in the population on Isla San Lorenzo del Sur, and *C. catalinensis* has no rattles other than the proximal segment (Campbell and Lamar. 1989. The Venomous Reptiles of Latin America. Cornell Univ. Press, Ithaca, New York. 425 pp.). A captive rattleless *C. v. viridis* gave birth to a single rattleless neonate in a brood of 12 (H. M. Smith, pers. comm.).

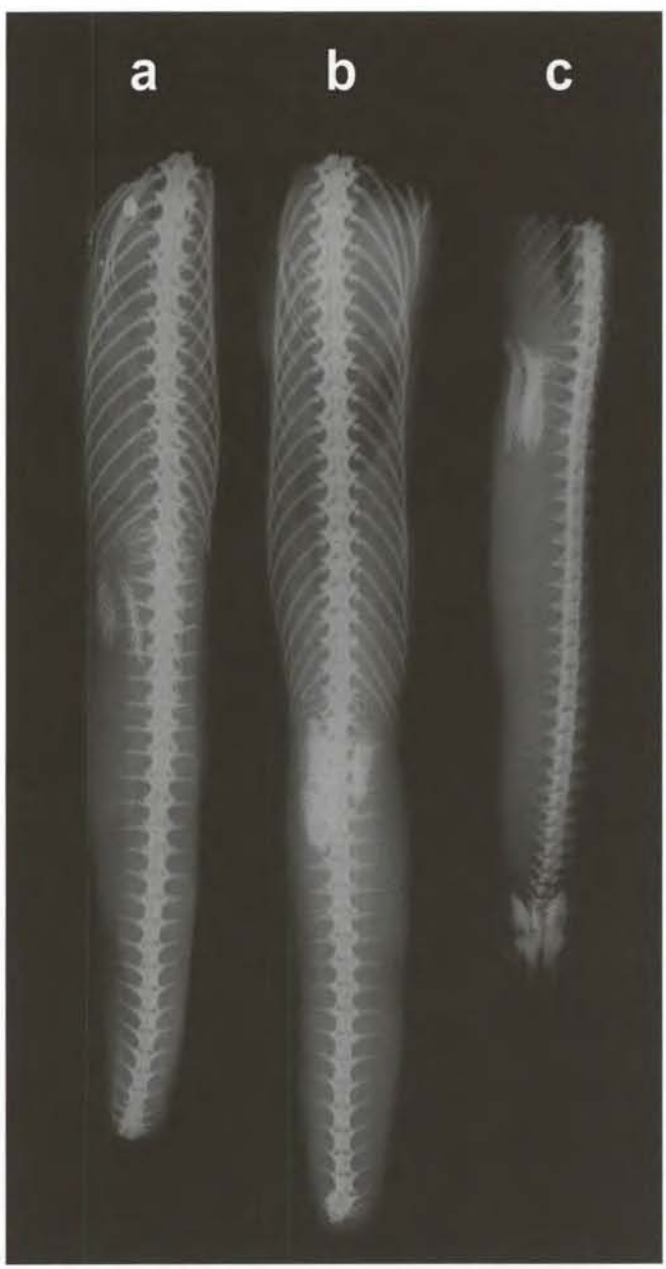


FIG. 1. Radiograph of three *Crotalus atrox*, showing normal tail (left) and congenital absence (middle, right) of rattle segments. All specimens from Eddy Co., New Mexico.

While conducting studies at the 8th annual Rattlesnake Extravaganza in Alamogordo, New Mexico, USA, during April 1995, CWP and LAF obtained two rattleless *C. atrox*. These specimens were collected from a den near Artesia, Eddy Co., New Mexico, on an unspecified date in April 1995. The hunter (anonymous) indicated he had observed other rattleless *C. atrox* in the same area.

The posterior 15 cm of each specimen was removed, X-rayed, and compared with a specimen possessing normal rattles (Fig. 1). The abnormal specimens were examined grossly for evidence of injury and corresponding scar tissue. The radiograph and gross exam revealed no evidence of scar tissue or previous injury, so we conclude that this condition was congenital rather than the result of an injury or removal of the rattles by trophy hunters. This is the first report of this rattleless condition in *C. atrox*. The specimens (MSB 60386-388) are accessioned into the Division of Herpetology, Museum of Southwestern Biology, University of New Mexico.

Submitted by **CHARLES W. PAINTER**, Endangered Species Program, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico, 87504, USA (e-mail: cwpaint@unm.edu), **LEE A. FITZGERALD**, Texas A & M University, Department Wildlife and Fisheries Sciences, College Station, Texas, 77843-2258, USA, and **MARK L. HEINRICH**, Carlsbad Animal Clinic, 103 East Blodgett, Carlsbad, New Mexico 88220, USA.

CROTALUS LEPIDUS (Rock Rattlesnake), ***CROTALUS MOLOSSUS*** (Blacktail Rattlesnake), ***CROTALUS PRICEI*** (Twin-spotted Rattlesnake), ***CROTALUS TIGRIS*** (Tiger Rattlesnake). **ENDOPARASITES.** There are, to our knowledge, no reports of endoparasites for *Crotalus lepidus, C. pricei* or *C. tigris*. There is one report of a nematode, *Kalicephalus inermis* in *C. molossus* from México (Prado Vera 1971. Thesis, Univ. Nac. Auton. México, D. F. 102 pp.). The purpose of this note is to report the presence of larval tapeworms (cestodes) in *C. molossus* and *C. pricei* and larval spiny-headed worms (acanthocephalans) in *C. lepidus* and *C. tigris*. The body cavities of a total of 55 *C. lepidus* from Arizona, Texas and México, 129 *C. molossus* from Arizona, New Mexico, Texas and México, 40 *C. pricei* from Arizona and México and 117 *C. tigris* from Arizona and México in the herpetology collections of the Natural History Museum of Los Angeles County and the University of Arizona were examined for helminths. A mid-ventral incision was made in the body wall, and organ surfaces and mesenteries in the posterior portion of the body cavity were visually checked for helminths. Oblong whitish bodies, approximately 1 by 3 mm were occasionally seen. These proved upon microscopic examination to be oligacanthorhynchid acanthocephalan cystacanths in *C. lepidus* and *C. tigris*, and tetrathyridia of *Mesocestoides* sp. in *C. molossus* and *C. pricei*. Prevalence of infection (infected snakes/sample examined x 100) was 5% each for oligacanthorhynchid cystacanths in *C. lepidus* and *C. tigris* and 2% and 5% for tetrathyridia of *Mesocestoides* sp. in *C. molossus* and *C. pricei*, respectively. Specimens were deposited in the U.S. National Parasite Collection, Beltsville, MD: oligacanthorhynchid cystacanths, *C. lepidus* (87642), *C. tigris* (87643); tetrathyridia of *Mesocestoides* sp., *C. molossus* (87644), *C. pricei* (87645).

Oligacanthorhynchid cystacanths have been found in other North American crotalids, *Crotalus atrox* and *C. scutulatus* (Bolette 1997. J. Parasitol. 83:751–752; Bolette 1997. Southwest. Nat. 42:232–236). Tetrathyridia of *Mesocestoides* sp. have been reported *C. atrox* and *C. viridis* (Bolette 1997. J. Parasitol. 83:751–

752; Mankau and Widmer 1977. Jap. J. Parasitol. 26:256–259). Rattlesnakes are believed to be paratenic hosts (Bolette *op. cit.*). The presence of oligacanthorhynchid cystacanths in *C. lepidus* and *C. tigris*, and tetrathyridia of *Mesocestoides* sp. in *C. molossus* and *C. pricei* are new host records and represent the first records of helminths in *C. lepidus, C. pricei* and *C. tigris*.

We thank Robert L. Bezy (Natural History Museum of Los Angeles County) and Charles H. Lowe (University of Arizona) for permission to examine *Crotalus lepidus, C. molossus, C. pricei* and *C. tigris* for helminths.

Submitted by **STEPHEN R. GOLDBERG,** Department of Biology, Whittier College, Whittier, California 90608, USA, e-mail: sgoldberg@whittier.edu, and **CHARLES R. BURSEY,** Department of Biology, Pennsylvania State University, Shenango Campus, Sharon, Pennsylvania 16146, USA; e-mail: cxb13@psu.edu.

CROTALUS MOLOSSUS MOLOSSUS (Northern Blacktail Rattlesnake). **BROOD DEFENSE.** An adult *Crotalus molossus molossus* was encountered near Tanque Verde Creek, Reddington Pass, Pima County, Arizona, USA, on a morning in early September 1984 (ca. 8 September). It was crawling toward me while rattling at 5 m distance, and when I stopped, the snake stopped 3 m away. After about 10–15 s, it returned in the direction from which it had crawled, traveling 4 m to an opening at the base of a massive rock outcrop, where it coiled. After a pause of ca. one minute, I approached to within 5 m and the snake again crawled toward me while rattling. When I stopped, the snake stopped about 2 m away, and after 5–10 s, it returned to the same opening at the base of the outcrop. On approach to 1.5 m from the opening, up to five newborn young were seen near the adult and although the adult did not advance again, it did rattle briefly. After a few minutes, one of the young crawled out of the refuge opening in front of the adult. The adult moved forward until it was resting on top of the young. The young struggled free and both returned to the opening. The posterior body and tail of the adult were notably thin, and the tail was proportionally short indicating a female. The young had a bluish cast and opaque pre-buttons, but the eyes were clear. The following day the adult and three or four young were present, but did not react to my presence. The next day there were two young and a shed skin with the adult, and on the fourth day neither the adult nor young were present. Later the opening under the overhang was found to extend horizontally at least 1.3 m.

Initially the refuge was approached directly with considerable commotion and twice the snake appeared to exhibit defensive behavior as I moved in its direction. This behavior was not observed on subsequent, stealthier visits. There are numerous accounts of pit vipers remaining with their young or eggs (Greene 1997. Snakes, the Evolution of Mystery in Nature. Univ. California Press, Berkeley, California. 288 pp.), but brood defense has only been reported for *Agkistrodon piscivorus conanti* (Walters and Card 1996. Herpetol. Rev. 27:203).

I thank Jillian Cowles, Harry Greene and David Hardy, Sr., for comments on the manuscript.

Submitted by **WILLIAM SAVARY**, Department of Facilities Management, University of Arizona, Tucson, Arizona 85721, USA.

CROTALUS VIRIDIS LUTOSUS (Great Basin Rattlesnake). **MORTALITY.** Although rodents have been reported as enemies of rattlesnakes, especially in laboratory or enclosed situations (Klauber 1972. Rattlesnakes. Univ. California Press, Berkeley. 1536 pp.), documentation of interactions in nature is uncommon. Here, we 1) relate the mortality and possible predation of two *Crotalus viridis lutosus* to environmental temperature and condition of snakes at a natural hibernaculum, and 2) note the specific targeting of venom glands by a predator/scavenger. This observation was made at a large snake hibernaculum in Butte Co., Idaho, USA, on the property of the Idaho National Engineering and Environmental Laboratory.

FIG. 1. Body of *Crotalus viridis* showing extensive tissue loss. Note injury to the right venom gland and teeth marks on transmitter.

As part of a hibernation project on *C. v. lutosus*, we surgically implanted radiotransmitters (8–9 g) into seven adult female snakes and released them at their hibernaculum within one week. On 25 October 1991 we released the last two snakes: #349 (SVL = 77 cm, mass = 339 g) and #365 (SVL = 76 cm, mass = 321 g). On 4 November 1991, all seven radio-equipped snakes were underground within the hibernaculum and presumed alive. On 6 November, rattlesnakes #349 and #365 were found dead and mutilated at two different openings of the hibernaculum. Both snakes possessed injuries to the body; one had minor skin lacerations but the other suffered considerable tissue loss (Fig. 1). Most notable,

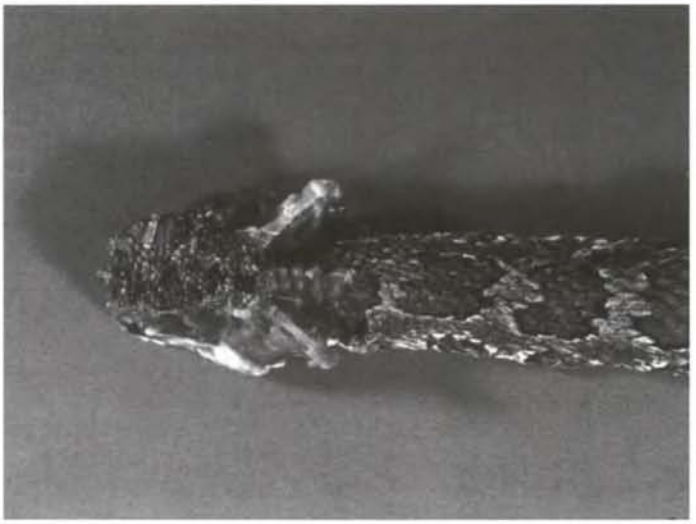


FIG. 2. Head of *Crotalus viridis* missing venom glands.

were the injuries to the lateral, posterior areas of the head, where the venom glands are located (Fig. 2). Both venom glands of one snake and one of the other were completely missing. Examination of the injuries and bite marks on one radiotransmitter suggested that the predator/scavenger was a rodent. The only likely rodent predator of rattlesnakes in this area is the bushy-tailed woodrat (*Neotoma cinerea*), a species commonly associated with this hibernaculum.

We suspect these two snakes were remaining active and basking near the entrances to the hibernaculum to promote healing of the suture site. Although we maintained the postsurgical snakes at warm temperatures for five days, healing may have been incomplete. Unfortunately, the weather worsened shortly after the snakes were released and remained relatively cool, allowing little time for the snakes to bask and maintain warm body temperatures. From release date until their death, operative snake body temperatures (measured with a datalogger and painted copper models) only rose above 20°C a total of 8.5 h. These reduced temperatures may have delayed healing and resulted in suboptimal locomotory and defensive performances (Peterson et al. 1993, *In* Seigel and Collins (eds.), Snakes: Ecology and Behavior, pp. 241–314. McGraw-Hill, New York), thereby increasing the snakes' vulnerability to predators. Halpin (1983. Am. Midl. Nat. 109:50–54) suggested that cool environmental temperatures may have facilitated a predation event on *Coluber* by prairie dogs (*Cynomys ludovicianus*), and Rowe and Owings (1990. Ethology 86:237–249) have suggested that ground squirrels can assess the risk of attacking a rattlesnake by detecting whether a snake is warm or not. Alternatively, the snakes may have died from other causes and been scavenged by rodents. Regardless of the mode of death, venom glands were specifically selected for consumption. We know of no other case where rodents have targeted snake venom glands. However, a possibly related observation involves wasps exhibiting specific attraction to the venom glands of freshly dead *C. viridis* on two separate occasions (Brent Charland, pers. comm.).

Submitted by **VINCENT A. COBB**, Department of Biology, Northeastern State University, Tahlequah, Oklahoma 74464, USA (e-mail: cobbva@cherokee.nsuok.edu); and **CHARLES R. PETERSON**, Department of Biological Sciences, Idaho State University, Pocatello, 83209, USA (e-mail: petechar@isu.edu).

ELAPHE FLAVIRUFA (Tropical Rat Snake). **PREDATION and DIET.** The only available record of the food habits of *Elaphe flavirufa* concerns the remains of an unidentified bird in the stomach of a snake collected in Mexico (Lee. 1996. The Amphibians and Reptiles of the Yucatán Peninsula. Cornell University Press, Ithaca, New York. 500 pp.). Here, we report a juvenile *E. flavirufa* feeding on two species of bats. On 20 July 1997 at ca. 2010 h, we observed a juvenile *E. flavirufa* (375 mm SVL; 472 mm total length; 22 g mass) on a wooden rafter (279 cm above the ground) in a thatched structure at the Lamanai Field Research Center, Indian Church Village, Orange Walk District, Belize. The snake was being attacked by two unidentified rodents, one of which seized the snake just behind the head and eventually killed it. A struggle then ensued between the two rodents over the dead snake, and shortly after the snake was dropped to the ground. The snake was collected, and subsequent examination of stomach contents revealed a black-winged little yellow bat (*Rhogeessa tumida*) and a little brown bat (*Myotis* spp.), both of which had been swallowed head-first. Frequently we observed bats roosting on the walls and ceiling of the thatched structure, and we suspect the bats in this instance may have been captured and eaten while roosting. The snake was deposited in the Campbell Museum (CUSC 1444), Clemson University, Clemson, South Carolina. The bats will be deposited in the American Museum of Natural History.

We are grateful to Bruce Miller for identifying the bats, Mark and Monique Howells for logistic support and accommodations at Lamanai Field Research Center/Lamanai Outpost Lodge, and Travis Crabtree for reviewing this manuscript.

Submitted by **THOMAS R. RAINWATER***, Lamanai Field Research Center, P.O. Box 63, Orange Walk, Belize, and **STEVEN G. PLATT**, Wildlife Conservation Society, Lamanai Field Research Center, P.O. Box 63, Orange Walk, Belize. * Present address: The Insitute of Environmental and Human Health, Department of Biological Sciences, Texas Tech University, 1207 Gilbert Drive, Lubbock, Texas 79416, USA.

LANGAHA MADAGASCARIENSIS (Leaf-nosed Snake). **REPRODUCTION**. On 10 September 1997, a wild collected, gravid *Langaha madagascariensis*was acquired by the Dallas Zoo's Department of Herpetology. On 2 October 1997, this specimen oviposited five eggs beneath a two-inch layer of sphagnum moss, which was used as a substrate in the specimen's enclosure. The eggs were measured (length [mean ± SD] = 24.4 ± 0.11 mm; width = 11.5 ± 0.08 mm). The eggs were incubated in a 1:1 mixture of vermiculite and water. Incubation temperature fluctuated from 24 to 27°C. Five neonates (125.6 ± 0.47 mm SVL; 1.5 ± 0.04 g) hatched after an incubation period of 81 days. Although human intrusion may have affected some of the data presented here, I believe this observation is noteworthy because nothing is known concerning the reproduction of this species in the wild.

My thanks to the staff of the Dallas Zoo Department of Herpetology for helpful comments and review of this manuscript.

Sumitted by **RICHARD D. REAMS**, Dallas Zoo Department of Herpetology, 650 R.L. Thornton Highway, Dallas, Texas 75203, USA.

LEPTODEIRA ANNULATA (False Mapanare, Banded Cat-Eyed Snake). **PREDATION**. Natural predation upon snakes by insects is rarely observed or photographically documented, and most reported cases involve mantid or water bug predators (Greene 1988. *In*: Gans and Huey (eds.), Biology of the Reptilia, Vol. 16, Ecology B. pp. 1–152. Alan R. Liss, New York); cases involving other insects are exceptional and occasionally remarkable (e.g., *Formica* ants; Graves 1989. Herpetol. Rev. 20:71). A group of students and one of us (ALM) observed predation upon a juvenile *Leptodeira annulata* (ca. 24 cm total length) by a carabid beetle (*Enceladus gigas* Bonelli, Tribe Siagonini; ca. 4 cm total length) at 2100 h on a blacktop road in northern Venezuela (Estado Guarico, 9 km ESE Paso Real) on 25 June 1997. The road traverses a xeric area with disturbed grassland and open bushy vegetational communities on gently rolling hills.

The snake had apparently just been captured when discovered as it was writhing rapidly and attempting to escape, and no exposed tissue or blood were evident at the site of the beetle's grasp, which was about 4 cm posterior to the snake's head. The snake did not attempt to bite the beetle. Within 1.5 min, the snake was immobilized, and its body was nearly severed at the point of attack, with lung tissue protruding from the incision (Fig. 1).

The freqency and significance of predation upon snakes by beetles are unknown. Larochelle (1990. The Food of Carabid Beetles [Coleoptera: Carabidae, including Cicindelinae], Fabreries, Suppl. 5, Association des Entmologistes Amateurs du

Quebec, Quebec. 132 pp.) compiled from the scientific literature a list of dietary items utilized by 1054 species of Carabidae, and snakes were absent. There is a detailed case of natural predation by a diving beetle larva (*Dytiscus*: Dytiscidae) upon a juvenile garter snake (*Thamnophis elegans*) reported by Drummond and Wolfe (1981, Coleopterists Bull. 35:121–124). This attack was similar to the one reported here in that both occurred near the snake's head, perhaps because it is a vulnerable area appropriate for a quick kill and/or to decrease the chance of being bitten by the snake.

FIG. 1. Juvenile *Leptodeira annulata* ca. 1.5 min. after capture by a carabid beetle (*Enceladus gigas*). The snake's body is almost completely severed at the site of the beetle's grasp.

Submitted by **ALLAN L. MARKEZICH**, Department of Natural Sciences and Engineering, Black Hawk College, Moline, Illinois 61265-5899, USA (e-mail: markezicha@bhc1.bhc.edu), and **PHILIP PARRILLO,** Insect Division, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605-2496, USA.

NERODIA ERYTHROGASTER (Plain-bellied Water Snake). **SIZE.** The record total lengths (SVL + tail length) for subspecies of *Nerodia erythrogaster* given in Conant and Collins (1991. A Field Guide to Reptiles and Amphibians of Eastern and Central North America. Houghton Mifflin Co., Boston, Massachusetts. 450 pp.) are 157.5 cm (*N. e. erythrogaster*), 149.9 cm (*N. e. flavigaster*), and 147.3 cm (*N. e. transversa*).

Here I report a female *N. e. flavigaster* (ALA 65-3860 in the Alabama Museum of Natural History) with a total length of 163.6 cm (131.9 cm SVL + 31.7 cm tail length). Approximately 1 cm of the tail is missing. The specimen is preserved in alcohol and was unable to be stretched in the manner of a live or freshly dead specimen. I captured this snake on the night of 16 April 1960, while it was swimming at Springhill Lake, Tuscaloosa Co., Alabama, USA. Accompanying me on the field trip were Gay M. Lake, Jr., Roy E. Smith, and William Gandrud. The specimen was preserved the following day by Shirley Whitt.

I thank Charles Lydeard (Curator of Herpetology, University of Alabama) for assistance in measuring the specimen. Michael E. Dorcas commented on the manuscript. Manuscript preparation was supported by Financial Assistance Award Number DE-FC09-96SR18546 from the U.S. Department of Energy to The University of Georgia Research Foundation.

Submitted by **J. WHITFIELD GIBBONS**, Savannah River Ecology Laboratory, Drawer E, Aiken, South Carolina 29802, USA.

NERODIA FLORIDANA (Florida Green Watersnake). **REPRODUCTION**. Large broods of *Nerodia floridana* are not uncommon, averaging 20–30 offspring (Tennant 1997. A Field Guide to Snakes of Florida. Gulf Publishing Co., Houston, Texas. 257 pp.), with a record litter size of 101 reported from Polk Co., Florida (Telford 1948. Herpetologica 4:184).

On 6 July 1997, a *N. floridana* was found in Orlando, Orange County, Florida, USA (28°32' 56"N, 81°19'08"W), on the edge of Lake Barton in a residential yard. The resident, mistaking the snake for an *Agkistrodon piscivorus* (Florida cottonmouth), killed it with a shovel. On 10 July 1997, the resident called one of us (FMM) to retrieve the snake, which had been kept in a cooler of ice. The snake was in good condition except for a small wound ca. 20 cm from the cloaca. After further investigation, the snake was found to have been gravid and four fully-developed snakes were removed from the wound.

The specimen was kept in a freezer and later transferred to the Florida Museum of Natural History on 8 August 1997. Subsequent examination revealed that the snake contained an additional 128 fully developed embryos, of which only one showed any external deformities (the ventral side of this snake was folded on itself and fused for the anterior two-thirds of its length). Pertinent data for 128 embryos is: length (mean ± SD = 257 ± 13 mm; range = 170–280 mm); SVL (192 ± 10 mm; 125–211 mm); and mass (10.0 ± 1.3 g; 2.4–11.7 g). The adult female measured 175.0 cm total length (135.0 cm SVL) only 13.0 cm short of the record total length for this species (Conant and Collins 1991. Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Houghton Mifflin Co., Boston, Massachusetts. 450 pp.). Female mass without embryos was 2835 g. The total mass of the embryos (1274 g) represents 45% of the adult's mass (without embryos). The adult and 128 offspring were deposited in the collection of the Florida Museum of Natural History at the University of Florida (UF 109763). The identification was verified by R. Franz of the Florida Museum of Natural History.

To our knowledge, this is the largest litter size (132) recorded for any member of the family Colubridae and second only to a record litter for all snakes of 156 for *Bitis arietans* (Branch 1978. The Snake 9:67–86)

We thank Nick Wray and Mike Talbot for assistance measuring and preserving this large brood. We also thank Dick Franz, Jonathan Campbell, and Ron Gutberlet for assistance in preparing this note.

Submitted by **KENNETH P. WRAY**, Department of Biology, University of Texas at Arlington, Arlington, Texas 76019, USA, and **FLAVIO M. MORRISSIEY**, Curator of Zoological Services, 14501 South Orange Blossom Trail US 441, Gatorland, Orlando, Florida 32837, USA.

RHADINAEA BOGERTORUM (Oaxacan Graceful Brown Snake). **CLUTCH SIZE**. Despite extensive studies of reproduction in reptiles (Fitch 1970. Univ. Kansas Mus. Nat. Hist. Misc. Publ. 52:1–247) and a monograph of the genus *Rhadinaea* (Myers 1974. Bull. Amer. Nat. Hist. 153:1–256), no data exist on reproduction in *Rhadinaea bogertorum*. Two gravid females were found in the Comaltepec municipality, Oaxaca, México. The first specimen (SVL 330 mm, tail length [TL] 88 mm, mass 10.4 g) was found on 31 March 1988 by Efraín Hernández and deposited in

Museo de Zoología Facultad de Ciencias (MZFC 4518), and the second specimen (SVL 348 mm, TL 126 mm, mass 18.5 g) was collected by Leo Schibli on 8 October 1994 and deposited in Colección de Herpetología del Instituto de Biología (IBH 11280). The first female had 9 non-vitellogenic follicles (volume [mean ± SE (range)] = 2.59 ± 0.47 mm^3 [0.58–5.43 mm^3]) and 2 oviductal eggs; mass = 0.325 ± 0.0135 g [0.312–0.339 g]). Relative clutch mass (RCM) was 0.069 g. The second female had 12 non-vitellogenic follicles (volume = 3.85 ± 0.81 [0.627–8.34 mm^3]), and 7 vitellogenic follicles (volume = 74.1 ± 5.87 [50.9–93.7 mm^3]). These data support the idea that species of *Rhadinaea* have a relatively small clutch size (Fitch 1970, *op. cit.*).

Submitted by **AURELIO RAMÍREZ-BAUTISTA**, and **MARIO MANCILLA MORENO**, Departamento de Zoología, Instituto de Biología, UNAM, A.P. 70-153, C. U., C.P. 04510, México 20, Distrito Federal, México.

THAMNOPHIS ELEGANS VAGRANS (Wandering Garter Snake). **DIET**. The diet of *Thamnophis elegans* has been extensively studied in many portions of its range (Rossman et al. 1996. The Garter Snakes: Evolution and Ecology. Univ. Oklahoma Press, Norman, Oklahoma. 332 pp., and references therein). On 31 July 1992 in the Jemez Mountains near Alamo Canyon, ca. 14 air km SW of Los Alamos (T18N R5E SE1/4 Sec. 9), Sandoval County, New Mexico, USA, CWP and MJA collected an adult *T. elegans* (279 mm SVL) that contained an adult Jemez Mountains salamander, *Plethodon neomexicanus* (ca. 59.8 mm SVL). The salamander was eaten tail first and the tail was completely digested up to the vent. These specimens are cataloged in the University of New Mexico Museum of Southwestern Biology as MSB 55407 (*T. elegans*) and MSB 55408 (*P. neomexicanus*).

On 20 July 1986 in the Sacramento Mountains, Water Canyon at the mouth of Telephone Canyon, ca 15.5 air km S of Cloudcroft (T17S R11E SE1/4 Sec. 24), Otero County, New Mexico, NJS and CWP collected an adult *T. elegans* (ca. 230 mm SVL) that contained an unidentified slug and a small Sacramento mountain salamander, *Aneides hardii* (30 mm SVL). The *T. elegans* is MSB 47339; the *A. hardii* was not cataloged. This is the first report of these New Mexico endemic plethodontid salamanders in the diet of *T. elegans*.

Submitted by **CHARLES W. PAINTER**, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, USA, e-mail: cwpaint@unm.edu; **NORMAN J. SCOTT, Jr.**, U.S. Geological Survey, Piedras Blancas Research Station, P.O. Box 70, San Simeon, California 93452-0700, USA, e-mail: norman_scott@usgs.gov; and **MARILYN J. ALTENBACH**, New Mexico Natural Heritage Program, 851 University Blvd., Suite 101, Albuquerque, New Mexico 87131, USA; e-mail: altenbac@sevilleta.unm.edu.

UROTHECA (PLIOCERCUS) ELAPOIDES (False Coral Snake). **REPRODUCTION and DIEL ACTIVITY.** A female *Urotheca elapoides* (374 mm SVL) was collected on 12 January 1991 from Cuxta Bani, upper Raspaculo river, Maya Mountains, Belize, and deposited in The Natural History Museum, London (BMNH 1996.441). This snake was examined for signs of reproductive activity and found to contain five well-formed oviductal eggs. Egg sizes ranged from 18.5 x 6.5 mm to 21.5 x 8.0 mm, and averaged 20.2 x 7.5 mm.

Clutch size in this specimen falls within the range reported for *U. elapoides* (5–8 eggs) by Martin (1958. Misc. Publ. Mus. Zool. Univ. Michigan 101:1–102). The timing of reproduction, however, is unusual. Clutch deposition in specimens from Mexico (Greene 1969. J. Herpetol. 3:27–31; Martin, *op. cit.*) and El Salvador (Mertens 1952. Abh. Senckenb. Naturforsch. Ges. 487:1–120) has occurred during June–August, suggesting the summer wet season as the time of egg-laying in this species. The Belize snake was found gravid at the opposite time of year and, assuming that oviposition was imminent, the hatchlings would have almost certainly emerged during the local February–May dry season. This seems curious for a species that inhabits damp leaf litter and feeds largely on salamanders. Certain salamanders, however, may be reproductively active during the dry season; in neighboring El Petén, Guatemala, Duellman (1963. Univ. Kansas Mus. Nat. Hist. Publ. 15:205–249) found two species of salamanders (*Bolitoglossa doefleni* and *B. mulleri*) with eggs in February and March.

BMNH 1996.441 was found moving through wet leaf litter during the day (1530 h). Two other *U. elapoides* in Belize were observed foraging within a few m of each other on 26 May 1994 at 0800 h (vicinity of Ceibo Grande, Cayo District, pers. obs.), and there are two specimens from Toledo District in the Smithsonian collection (USNM 319776 and 319777; Union Camp, Columbia River Forest Reserve) also collected by day (5 and 7 April 1992). These observations concur with Smith and Chiszar's (1996. Species-Group Taxa of the False Coral Snake Genus *Pliocercus*. Ramus Publishing Inc., Pottsville, Pennsylvania. 112 pp.) assertion that *U. elapoides* is fundamentally diurnal in habits. Coincidental observations of the sympatric coral snakes *Micrurus diastema* and *M. hippocrepis* in Belize, which *Urotheca* appears to mimic, indicate that these species are also at least partly diurnal (pers. obs.).

The specimen was collected under authority of Ministry of Natural Resources (Belize) permits M/127/9/91(26) and 000159.

Submitted by **PETER J. STAFFORD**, Department of Botany, The Natural History Museum (BMNH), Cromwell Road, London SW7 5BD, UK.

GEOGRAPHIC DISTRIBUTION

Herpetological Review publishes brief notices of new geographic distribution records in order to make them available to the herpetological community in published form. Geographic distribution records are important to biologists in that they allow for a more precise determination of a species' range, and thereby permit a more significant interpretation of its biology.

These geographic distribution records will be accepted in a **standard format** only, and all authors *must* adhere to that format, as follows: SCIENTIFIC NAME, COMMON NAME (for the United States and Canada as it appears in Collins 1997. *Standard Common and Current Scientific Names for North American Amphibians and Reptiles*. Fourth Edition. SSAR Herpetol. Circ. 25:1–40; for México as it appears in Liner 1994, *Scientific and Common Names for the Amphibians and Reptiles of Mexico in English and Spanish.* Herp. Circ. 23:1–113), LOCALITY (use metric for distances and give precise locality data), DATE (day-month-year), COLLECTOR, VERIFIED BY (*cannot* be verified by an author—curator at an institutional collection is preferred), PLACE OF DEPOSITION (where applicable, use standardized collection designations as they appear in Leviton et al. 1985, *Standard Symbolic Codes for Institutional Resource Collections in Herpetology and Ichthyology,* Copeia 1985[3]:802–832) and CATALOG NUMBER (required), COMMENTS (brief), CITATIONS (brief), SUBMITTED BY (give name and address in full—spell out state names—no abbreviations).

Some further comments. This geographic distribution section does not publish "observation" records. Records submitted should be based on preserved specimens which have been placed in a university or museum collection (private collection depository records are discouraged; institutional collection records will receive precedence in case of conflict). A good quality color slide or photograph may substitute for a preserved specimen *only* when the live specimen could not be collected for the following reasons: it was a protected species, it was found in a protected area, or the logistics of preservation were prohibitive (such as large

turtles or crocodilians). Color slides and photographs *must* be deposited in a university or museum collection along with complete locality data, and the color slide catalog number(s) must be included in the same manner as a preserved record. Before you submit a manuscript to us, check Censky (1988, *Index to Geographic Distribution Records in Herpetological Review: 1967–1986*) to make sure you are not duplicating a previously published record.

Please submit any geographic distribution records in the **standard format only** to one of the Section Co-editors: Joseph T. Collins (USA & Canadian records only), Museum of Natural History—Dyche Hall, The University of Kansas, Lawrence, Kansas 66045–2454, USA; Jerry D. Johnson (México and Central America, including the Caribbean islands), Department of Biology, El Paso Community College, P.O. Box 20500, El Paso, Texas 79998-0500, USA; Hidetoshi Ota (all Old World records), Tropical Biosphere Research Center, University of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-01, Japan; or Gustavo J. Scrocchi (South American records), Instituto de Herpetología, Fundación Miguel Lillo, Miguel Lillo 251, 4000 Tucumán, Argentina. Short manuscripts are strongly discouraged, and are only acceptable when data cannot be presented adequately in the standard format. **Submissions by e-mail are encouraged where possible**. Refer to inside front cover for e-mail addresses of section editors.

Recommended citation for new distribution records appearing in this section is: Marques, O. A. V., and G. Puorto. 1996. Geographic Distribution. *Chironius laevicollis*. Herpetol. Rev. 27:212.

CAUDATA

AMBYSTOMA TIGRINUM (Eastern Tiger Salamander). USA: WISCONSIN: MARQUETTE CO: 3.2 km W Wisconsin Rt. 22 on Co. Rt. J, ca. 8 km N Montello, SW1/4 of NW1/4 Sec. 17, T16N, R10E. 17 October 1998. William S. Brooks. MPM 30316. Verified by Robert W. Henderson. New county record (Casper 1996, Geographic Distributions of the Amphibians and Reptiles of Wisconsin. Publ. Milwaukee Public Mus. 1–87). Fills range gap ca. 15 km from nearest records mapped by Vogt (Vogt 1981, Natural History of Amphibians and Reptiles of Wisconsin. Publ. Milwaukee Public Mus. 205 pp.) and represents one of only seven localities for which records are available for Natural Division 4b, characterized by oak savanna, oak forest, and prairie; sandy loams; nearly level outwash plains and rolling moraine (Hole and Germain 1994, Natural Divisions of Wisconsin. Publ. Wisconsin Dept. Natural Res., Madison; Wisconsin Herp Atlas, Milwaukee Public Museum, unpubl. data). Lends credibility to only other reported observation in Marquette County by Lou Balaban from Sec. 11, T14N, R08E, in 1985 (Wisconsin Herp Atlas, *op. cit.*).

Submitted by **GARY S. CASPER**, Section of Vertebrate Zoology, Milwaukee Public Museum, 800 West Wells Street, Milwaukee, Wisconsin 53233, USA

NOTOPHTHALMUS PERSTRIATUS (Striped Newt). USA: GEORGIA: LIBERTY CO: Fort Stewart Military Reservation, ca. 5.4 air km NNE jct. Ga. Rt. 144/Fort Stewart Road 34 (ca. 1.4 km NW Bethel Cemetery), 31°59'02"N, 81°47'14"W. 10 January 1995. Aubrey E. Davis, Jr. SOCM 100. Verified by Robert A. Moulis. Adult dipnetted from 1.2 ha isolated cypress pond within longleaf pine (*Pinus palustris*)/wiregrass (*Aristida beyrichiana*) sandhill habitat. New county record (Williamson and Moulis 1994, Savannah Sci. Mus. Publ. 3:1–712). Adults were also observed at this site on 10 February 1998 (3 females) and 21 May 1998 (1 male); larval striped newts were collected here 21 May 1998 (D. Stevenson, unpubl. data).

Submitted by **DIRK J. STEVENSON**, Directorate of Public Works, Fort Stewart Fish and Wildlife Branch, 1557 Frank Cochran Drive, Fort Stewart, Georgia 31314, USA, and **AUBREY E. DAVIS, JR.**, Jacksonville State University, Biology Department, 108 Ayers Hall, Jacksonville, Alabama 36265, USA.

PSEUDOEURYCEA SCANDENS (Tamaulipan False Brook Salamander). MÉXICO: QUERÉTARO: 3.5 km SW El Lobo, elev. ca. 1800 m. 6 August 1969. Madge R. Minton. Minton Herpetological Collection 1108; 8 km SW Pinal de Amoles, elev. ca. 2680 m. 7 August 1969. Madge and Sherman Minton. Minton Herpetological Collection 1110; ca. 3 km N Pinal de Amoles, elev. ca 2620 m. 1 August 1987. Sherman Minton. Color slides U223–U224, Indiana State Museum. Verified by Ernest A. Liner and James R. Dixon. First records for state of Querétaro. Extends range southward about 200 km.

Submitted by **SHERMAN A. MINTON**, 4840 East 77th Street, Indianapolis, Indiana 46250, USA.

ANURA

AGALYCHNIS CALCARIFER. HONDURAS: GRACIAS A DIOS: near Baltiltuk (15°51'N, 84°45'W) at edge of trail alongside Río Plátano, 30 m elev. 9 July 1992. G. A. Cruz Díaz. UNAH 2808. Verified by M. R. Espinal. First record for country; extends range ca. 540 airline km N Río San Juan, Departamento de Río San Juan, Nicaragua (Caldwell "1994" [1995], Herpetol. Nat. Hist. 2[2]:57–66).

Submitted by **GUSTAVO A. CRUZ DÍAZ**, Departamento de Biología, Universidad Nacional Autónoma de Honduras, Tegucigalpa, Francisco Morazán, Honduras, and **JAMES R. McCRANIE**, 10770 SW 164th Street, Miami, Florida 33157-2933, USA.

CENTROLENE PROSOBLEPON. HONDURAS: OLANCHO: La Chorrera (15°00'N, 85°56'W), Sierra de Agalta, 1100 m elev. G. A. Cruz Díaz. UNAH 2570 (12 August 1991), UNAH 2613–15 (15 August 1991), UNAH 3041 (May 1992). All verified by M. R. Espinal. GRACIAS A DIOS: Baltiltuk (15°51'N, 84°45'W) along Río Plátano and a tributary, 30 m elev. G. A. Cruz Díaz. UNAH 3103-05 (11 August 1992), UNAH 3113 (14 August 1992). All verified by M. R. Espinal. First records for country with locality data; extend range ca. 210 airline km N and ca. 325 airline km NNE, respectively, of Selva Negra region, Departamento de Matagalpa, Nicaragua (Köhler 1998, Natur und Mus. 128:163–170).

Submitted by **GUSTAVO A. CRUZ DÍAZ**, Departamento de Biología, Universidad Nacional Autónoma de Honduras, Tegucigalpa, Francisco Morazán, Honduras, and **JAMES R. McCRANIE**, 10770 SW 164th Street, Miami, Florida 33157-2933, USA.

ELEUTHERODACTYLUS PLANIROSTRIS (Greenhouse Frog). GEORGIA: CHATHAM CO: private residence on Screven Avenue (32°03'35"N, 84°47'50"W). 31 July 1998. Janet Habas. University of Georgia Museum of Natural History (UGAMNH 40135–37. Verified by M. E. McGhee. First state record for this exotic species. Eggs, froglets, and adults collected from outdoor flower pots.

Submitted by **BRADFORD WINN**, Georgia Department of Natural Resources, Nongame Endangered Wildlife Program, One Conservation Way, Brunswick, Georgia 31520, USA, and **JOHN B. JENSEN**, Georgia Department of Natural Resources, Nongame Endangered Wildlife Program, 116 Rum Creek Drive, Forsyth, Georgia 31029,USA (e-mail: john_jensen@mail.dnr.state.ga.us), and **STEVE JOHNSON**, Department of Wildlife Ecology and Conservation, University of Florida, 303 Newins Ziegler Hall, Gainesville, Florida 32611-0430, USA (e-mail: tadpole@ufl.edu).

HYLA ANCEPS. BRAZIL: MINAS GERAIS: IPATINGA MUNICIPALITY: Fazenda Macedônia (19°28'S, 42°32'W, elev. 240 m). December 1992. L. B. Nascimento and T. A. M. Balstaedt. Museu de Ciéncias Naturais, Pontifícia Universidade Católica de Minas

Gerais (MCN-AM 1220–23). MARLIÉRIA MUNICIPALITY: Parque Estadual do Rio Doce (19°42'S, 42°36'W, elev. 536 m). November 1996. R. N. Feio. Museu de Zoologia João Moojen de Oliveira, Universidade Federal de ViÁosa (MZUFV 2767–68), and October 1997. R. N. Feio (MZUFV 3335–36). AIMORÉS MUNICIPALITY (19°29'S, 41°03'W, elev. 80 m). March 1997. L. B. Nascimento and M. A. V. N. Menezes (MCN-AM 1328–29). All verified by U. Caramaschi and J. P. Pombal, Jr. Published distribution of the species is the lowlands of the state of Rio de Janeiro (Frost 1985, Amphibian Species of the World. Allen Press, Lawrence, Kansas. 732 pp.) and the state of Espírito Santo (Haddad et al. Herpetol. Rev. 26:207) in southeastern Brazil. First state record.

Submitted by **LUCIANA BARRETO NASCIMENTO**, Departamento de Ciéncias Biológicas, Pontifícia Universidade Católica de Minas Gerais, 30.535-610 Belo Horizonte, Minas Gerais, Brazil, and **RENATO NEVES FEIO**, Museu de Zoologia João Moojen de Oliveira, Universidade Federal de Viçosa, 36.571-000 Viçosa, Minas Gerais, Brazil.

HYLA CINEREA (Green Treefrog) USA: TEXAS: LEE CO: 3 km (by road) NE jct. FM 1697 on Lee Co. Road 124 (30°19'04.8"N, 96°44'33.8"W). 12 September 1998. Toby J. Hibbitts and John H. Malone. TCWC 80499–500. Verified by James R. Dixon. New county record (Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.).

Submitted by **TOBY J. HIBBITTS**, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA and **JOHN H. MALONE**, Herpetological Independent Study Group, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA.

HYLA ELEGANS. BRAZIL: MINAS GERAIS: GUANHÃES MUNICIPALITY (18°46'S, 42°55'W, elev. 777 m). September 1992. L. B. Nascimento and T. A. M. Balstaedt. Museu de Ciéncias Naturais, Pontifícia Universidade Católica de Minas Gerais (MCN-AM 983–86). AIMORÉS MUNICIPALITY (19°29'S, 41°03'W, elev. 80 m). March 1997. L. B. Nascimento and M. A. V. N. Menezes (MCN-AM 1271–73). MARLIÉRIA MUNICIPALITY: Parque Estadual do Rio Doce (19°42'S, 42°36'W, elev. 536 m). October 1997. R. N. Feio, Museu de Zoologia João Moojen de Oliveira, Universidade Federal de Viçosa (MZUFV 3412–16). These localities are in the Atlantic Rain Forest Domain. CAETÉ MUNICIPALITY: Lagoa do Cabral (20°00'S, 43°40'W, elev. 945 m). November 1991. L. B. Nascimento and R. N. Feio (MCN-AM 784–85). SÃO GONÇALO DO RIO ABAIXO MUNICIPALITY: Estação Proteção e Desenvolvimento Ambiental de Peti (19°49'S, 43°21'W, elev. 627 m). December 1989. L. B. Nascimento (MCN-AM 235). MARIANA MUNICIPALITY (20°22'S, 43°24'W, elev. 712 m). January 1993. R. N. Feio (MZUFV 913, 915, 917). These localities are in the trasition Atlantic Forest—Cerrado Domains. ARAÇUAÍ MUNICIPALITY (16°50'S, 42°04'W, elev. 307 m). May 1990. L. B. Nascimento and J. B. Isaac Jr. (MCN-AM 380). This locality is in the Caatinga Domain. All verified by U. Caramaschi and J. P. Pombal, Jr. Published distribution for the species is Atlantic forests from Bahia to the state of São Paulo, Brazil (Frost 1985, Amphibian Species of the World. Allen Press, Lawrence, Kansas. 732 pp.) from sea level to an elev. of 800 m (Lutz 1973, Brazilian Species of *Hyla*. Univ. Texas Press. 260 pp.). First record for state of Minas Gerais.

Submitted by **LUCIANA BARRETO NASCIMENTO**, Departamento de Ciéncias Biológicas, Pontifícia Universidade Católica de Minas Gerais, 30.535-610 Belo Horizonte, Minas Gerais, Brazil, and **RENATO NEVES FEIO**, Museu de Zoologia João Moojen de Oliveira, Universidade Federal de Viçosa, 36.571-000 Viçosa, Minas Gerais, Brazil.

LITHODYTES LINEATUS (Sapito Lineado). VENEZUELA: ESTADO TÁCHIRA: Las Cuevas, Valle del Río Doradas, 550 m elev. J. Péfaur and R. Pérez. 14 February 1985. Colección de Vertebrados, Facultad de Ciencias, Universidad de los Andes, Mérida, Venezuela (CVULA IV-3652). Constitutes the only record in the country outside of the Guianan Shield in the states of Amazonas and Bolivar; more than 850 km to the NW of a nearer record in Venezuela, the High River Cunucunuma (Ginés 1959, Mem. Soc, Cien. Nat. La Salle 19[53]:85–146.). Lynch (1979. *In* W. E. Duellman (ed.). The South American Herpetofauna: Its Origin, Evolution and Dispersal, pp. 189–215. Mus. Nat. Hist. Univ. Kansas Monogr. No. 7.) showed a general distribution map for the species, where localities of the Andean piedmont are noted in Peru, Ecuador, and Colombia. First report for the Estado Táchira and for western Venezuela. Río Doradas valley constitutes the only place in the western region of the country with the presence of Amazonian elements.

Submitted by **CÉSAR LUIS BARRIO**, Fundación para el Desarrollo de las Ciencias Físicas, Matemáticas y Naturales, FUDECI, Apartado Postal 185, Caracas 1010-A, Venezuela (e-mail: fudeci@reacciun.ve).

ODONTOPHRYNUS AMERICANUS (Common Lesser Escuerzo). ARGENTINA: CORDOBA: Barreto (63°18'20"W, 33°20'43"S), Km 148, Ruta provincial N°4, 153 m. A. L. Martino. Laboratorio de Ecología, Facultad de Ciencias Exactas Físico-Químicas y Naturales, Universidad Nacional de Río Cuarto, Argentina (UNRC-ECO 609–612, 1 December 1998; UNRC-ECO 627–628, 15 October 1992; and UNRC-ECO 629–630, 15 October 1993). All verified by R. Martori. Males SVL 45–47 mm; females 35–36 mm. Males were calling in temporary pond; females were captured using pit traps.

Submitted by **ADOLFO L. MARTINO**, **NANCY E. SALAS**, and **ISMAEL E. DI TADA**, Ecología, Departamento de Ciencias Naturales, Facultad de Ciencias Exactas, Físico-Químicas y Naturales, Universidad Nacional de Río Cuarto, Km 601, Ruta Nacional N°36, (5800) Río Cuarto, Córdoba, Argentina (e-mail [ALM]: amartino@exa.unrc.edu.ar).

OSTEOPILUS SEPTENTRIONALIS (Cuban Treefrog) USA: FLORIDA: VOLUSIA CO: New Smyrna Beach, Bouchelle Island on N side of S causway (Rt. A1A). 13 August 1996. UF 115254. Verified by Arthur C. Echternacht. New county record; extends the northern range of this non-native species on the E coast of Florida by ca. 120 km from a coastal Brevard County record (Meshaka 1996, Herpetol. Rev. 27:37–40), and ca. 40 km NE of four unpublished museum records from Seminole County near Sanford in 1993 (UF 87341–44; David Auth, pers. comm.). One male was collected from the crotch of a cabbage palm leaf (Sabal palmetto) on the E shore of the island. Three others (two males, one female) were observed in palms on the island, which is being developed as a residential community. During summer 1996 and 1997, isolated males were occasionally heard calling at night in and around New Smyrna Beach, a quaint coastal town with rapidly increasing residential and commercial development. As indicated by Meshaka (*op. cit.*), the use of imported palms and other landscaping plants from south Florida will likely result in the establishment of additional breeding populations in this county and additional north Florida counties.

Submitted by **TODD CAMPBELL**, Department of Ecology and Evolutionary Biology, 569 Dabney Hall, University of Ten-

nessee, Knoxville, Tennessee 37996, USA (e-mail: lizardman@utk.edu).

PSEUDACRIS CLARKII (Spotted Chorus Frog) USA: TEXAS: FREESTONE CO: Richland Creek Wildlife Management Area, North Unit, near Jct US Rt. 287 and FM 488. 16 March 1998. Toby J. Hibbitts. TCWC 80124. Verified by James R. Dixon. Specimen collected during biodiversity inventory conducted on the Richland Creek WMA. New county record (Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.).

Submitted by **TOBY J. HIBBITTS**, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA.

SYNAPTURANUS MIRANDARIBEIROI (Sapito Apuntado de Miranda Ribeiro). VENEZUELA: ESTADO BOLÍVAR. East slopes of Cerro Santa Rosa, Serranía del Supamo (06°37'N, 62°27'W). Jun 1990. F. Mendoza. Museo de Ciencias Naturales, Caracas, (MCNC 8080). Verified by O. Fuentes. First country record and the northernmost for the species. Reported by Nelson and Lescure (1975. Herpetologica 31:389–397) from some localities in Guyana, French Guyana, Surinam, and Brazil, and by Pyburn (1975. Herpetologica 31:439-443) from SE Colombia.

Submitted by **CÉSAR LUIS BARRIO**, Fundación para el Desarrollo de las Ciencias Físicas, Matemáticas y Naturales, FUDECI, Apto Postal 185, Caracas 1010-A, Venezuela (e-mail: fudeci@reacciun.ve) and **CHARLES BREWER-CARÍAS**, P.O. Box 90214 El Hatillo, 1083-A Caracas, Venezuela (e-mail: brewerch@ven.net).

SYRRHOPHUS CYSTIGNATHOIDES (Rio Grande Chirping Frog). USA: TEXAS: WALKER CO: Huntsville. 16, 19, 22 April 1998. New county record from three new localities; extends geographic range ca. 120.8 km N Houston (Harris County). Frogs were found in rocky refuges within small intermittent streams (Localities: 30°42'11"N, 95°31'59"W; 30°42'14"N, 95°33'1"W; and 30°42'53"N, 95°33'7"W). Sam Houston State Vertebrate Museum (SHSVM 0001-98, 0002-98, and 0003-98). Specimens verified by J. P. Caldwell, R. D. Durtsche, and L. J. Vitt.

Submitted by **WILLIAM I. LUTTERSCHMIDT** and **MONTE L. THIES**, Department of Biological Sciences, Sam Houston State University, Huntsville, Texas 77341, USA.

TESTUDINES

APALONE FEROX (Florida Softshell). USA: GEORGIA: LIBERTY CO: Fort Stewart Military Reservation: Fort Stewart Road 129, 3.2 km NW jct. with Georgia Rt. 119. 12 June 1998. Brian J. Platt, Mark Bradford. SOCM 1319 (photo). Verified by Robert A. Moulis. Adult found AOR crossing road near unnamed blackwater stream (tributary of Canoochee Creek). New county record (Williamson and Moulis 1994, Savannah Sci. Mus. Publ. 3:1–712).

Submitted by **DIRK J. STEVENSON** and **BRIAN J. PLATT**, Directorate of Public Works, Fort Stewart Fish and Wildlife Branch, 1557 Frank Cochran Drive, Fort Stewart, Georgia 31314, USA.

EMYDOIDEA BLANDINGII (Blanding's Turtle). USA: ILLINOIS: JASPER CO: Prairie Ridge State Natural Area. 187 m south of Co. Rd. 500N and 248 m west of Co. Rd. 1000E (NE 1/4, SW 1/4, Sec. 34, T6N, R9E). 4 May 1998. W. E. Louis. Illinois Natural History Survey (INHS photo vouchers 1998-10 and 1998-11). Verified by M. J. Dreslik. Recently added to the Illinois threatened species list; new county record, extending the historical Illinois range south (Smith 1961, The Amphibians and Reptiles of Illinois. Illinois Nat. His. Surv. Bull. 298 pp.).

Submitted by **DANIEL J. OLSON** and **WADE E. LOUIS**, Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana, Illinois 61801, USA.

GEOCHELONE CARBONARIA (Red-footed Tortoise). BRAZIL: PARÁ: Ilha do Marajó, Anajás (01°07'24.9"S, 49°34' 45.3" W). 22 January 1998. T. L. Pinto. Verified by U. Galatti. Museu Paraense Emílio Goeldi (MPEG 277). First record of this species on Marajó Island in the Amazonia region (Nascimento, Ávila Pires, Santos and Lima 1991, Bol. Mus. Para. Emílio Goeldi, sér. Zool. Belém 7:25–41; Pritchard and Trebbau 1984, The Turtles of Venezuela. Publ. SSAR, Miami University, Oxford, Ohio. 403 pp.).

Submitted by **GABRIEL SILVA PINTO**, Museu Paraense Emílio Goeldi, Departamento de Zoologia, Caixa Postal 399, Belém, Pará, Brazil, and **RUBENS NOBUO YUKI**, Faculdades Integradas do Tapajós, Rua Rosa Vermelha, 335, Aeroporto Velho, Santarém Pará, CEP: 68010-200, Brazil.

STERNOTHERUS ODORATUS (Common Musk Turtle). USA: ILLINOIS: JASPER CO: Prairie Ridge State Natural Area. 210 meters south of Co. Rd 500N and 274 meters west of Co. Rd. 1000E (NE 1/4, SW 1/4, Sec. 34, T6N, R9E). 18 May 1998. D. J. Olson. Illinois Natural History Survey (INHS Photo vouchers 1998-12 and 1998-13). Verified by M. J. Dreslik. New county record; fills in the expected distribution (Smith 1961, The Amphibians and Reptiles of Illinois. Illinois Nat. His. Surv. Bull. 298 pp.).

Submitted by **DANIEL J. OLSON**, Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana, Illinois 61801, USA.

LACERTILIA

ANOLIS DISTICHUS (Bark Anole). USA: FLORIDA: BROWARD CO: Plantation. 11 July 1998. A. T. Reppas, K. L. Krysko, C. L. Sonberg, and R. H. Robins. Florida Museum of Natural History, University of Florida (UF 114327–329). Verified by F. Wayne King. New county record; indicates this non-indigenous species is expanding its range northward.

Submitted by **ANTHONY T. REPPAS**, Department of Interdisciplinary Studies and Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA, **KENNETH L. KRYSKO**, Department of Wildlife Ecology and Conservation and Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA (e-mail: kenneyk@flmnh.ufl.edu), **CARYN L. SONBERG**, Department of Education, University of Florida, Gainesville, Florida 32611, USA, and **R. H. ROBINS**, Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA (e-mail: rhrobins@flmnh.ufl.edu).

ELGARIA COERULEA (Northern Alligator Lizard). USA: NEVADA: DOUGLAS CO: Humboldt-Toiyabe National Forest, Spooner Summit, Rt. 50, unnamed National Forest Service road near a maintenance station, adult DOR with a broken tail (39°05'58"N, 119°54'25W), 2133 m elev. 12 November 1990. H. R. Panik. UNR 6949; Montreal Canyon, Humboldt-Toiyabe National Forest, ca. 0.4 km E on unnamed National Forest Service road, 1.3 km W jct. Rts. 28 and 50 (39°05'12"N, 119°54'12"W) 2152 m elev. Adult male found under a small cross-section of a pine log along a S-

facing slope in an aspen/pine forest. 12 August 1998. R. E. Espinoza, C. A. Carreño, A. R. Henderson, and R. W. Van Heest. UNR 6950. Both verified by J. Vindum. New county records; extends the range ca. 4.4 km SW (airline) from the closest reported locality at Clear Creek, Carson City (Vindum and Arnold 1997, Herpetol. Rev. 28:100). The database of the Nevada Natural Heritage Program also contains an unvouchered record for *E. coerulea* from a residential area in the city of Sparks (Washoe County, Nevada). Given the distance from other known populations in Nevada (e.g., 49.3 km NNE of Clear Creek), the lack of chief habitat requirements (Stebbins 1985, Peterson Field Guide to Western Reptiles and Amphibians. Houghton Mifflin, Boston, Massachusetts. 336 pp.), and the absence of records for this species from this densely populated area, we suspect the Sparks record is the result of a released or escaped individual rather than a naturally occurring population.

Submitted by **ROBERT E. ESPINOZA**, Biological Resources Research Center, and Ecology, Evolution and Conservation Biology, MS 314, University of Nevada, Reno, Reno, Nevada 89557, USA, **CARRIE A. CARREÑO**, Nevada Natural Heritage Program, 1550 East College Parkway, Suite 145, Carson City, Nevada 89706-7921, USA, and **RONALD W. VAN HEEST**, Biological Resources Research Center, University of Nevada, Reno, Reno, Nevada 89557, USA.

ENYALIOIDES HETEROLEPIS. PANAMÁ: PROVINCIA DE COCLÉ: Parque Nacional Omar Torrijos H., ca. 10 km N El Copé, headwaters of Río Guaybal, behind main park refugio on dirt road, ca. 600 m elev. 14 January 1998. Karen R. Lips. Fluid Vertebrate Collection, Southern Illinois University, SIUC R-3140 (photo). Verified by Robert Ibañez and Cesar Jaramillo. Adult male captured at night while sleeping on 1 m high stump along riverbank. Second capture was of juvenile sleeping ca. 1.5m over ground on sapling along trail ca. 100 m above same stream on 6 June 1998. New locality extends geographic range ca. 110 km west from Parque Nacional Soberanía, Panamá (Nicholson 1998, Herpetol. Rev. 29:174). New province record.

Submitted by **KAREN R. LIPS**, Department of Zoology, Southern Illinois University, Carbondale, Illinois, 62901-6501, USA.

EUMECES EGREGIUS SIMILIS (Northern Mole Skink). USA: GEORGIA: Candler Co: R. G. Daniels Preserve (The Nature Conservancy), ca. 5.8 km SE Metter. 8 March 1997. Dirk J. Stevenson and Beth A. Willis. SOCM 304. Verified by Robert A. Moulis. Adult found under debris in longleaf pine (*Pinus palustris*)/turkey oak (*Quercus laevis*)/wiregrass (*Aristida beyrichiana*) sandhill. New county record (Williamson and Moulis 1994, Savannah Sci. Mus. Publ. 3:1–712).

Submitted by **DIRK J. STEVENSON** and **BETH A. WILLIS**, Directorate of Public Works, Fort Stewart Fish and Wildlife Branch, 1557 Frank Cochran Drive, Fort Stewart, Georgia 31314, USA.

EUMECES GILBERTI RUBRICAUDATUS (Western Redtail Skink). USA: NEVADA: Nye Co: Nevada Test Site, Midway Valley on the E flank of Yucca Mountain, ca. 1130 m elev. (36°50'20"N; 116°26'15"W). 24 May 1995. C. L. Sowell and A. M. Ambos. BYU 46485. Verified by Jack W. Sites, Jr. Adult male (SVL = 79; TL = 120; 10.5 g); fills a distributional gap between Pahute Mesa (Medica et al. 1990, Herpetol. Rev. 21:40) and Grapevine Peak (Rogers and Fitch 1947, Univ. California Publ. Zool. 48:169–220). Specimen was collected in creosotebush (*Larrea tridentata*) bajada habitat which was drier and lower in elevation than would be expected for the species in this region (Banta 1962, Herpetologica 18:129–130). This was the only *E. gilberti* captured in this area during 6336 trap-days (24 h/d) of pitfall and funnel trapping and ca. 1000 person-days (4 h/d) of noosing conducted from 1991 to 1995.

Submitted by **JAMES L. BOONE** and **CHRIS L. SOWELL**, SAIC, 1261 Town Center Drive, Las Vegas, Nevada 89134, USA.

EUMECES TETRAGRAMMUS (Four-lined Skink). USA: ARIZONA: Cochise Co: Peloncillo Mountains, S Fork Skeleton Canyon, 1649 m elev. (31°31.41'N, 109°03.75'W). 9 August 1998. Andreas Noellert. Arizona State University (ASU 30936). Verified by Joseph T. Collins. First specimen from Arizona side of mountain range. (Degenhardt et al. 1996, Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. 431 pp.).

Submitted by **ANDY HOLYCROSS** and **BRIAN FEDORKO**, Biology Department, Arizona State University, Tempe, Arizona 85287-1501.

HEMIDACTYLUS TURCICUS (Mediterranean Gecko). USA: FLORIDA: Levy Co: Cedar Key, concrete block wall of the public restroom at the City Park adjacent to the Cedar Cove Hotel, NW1/4 Sec. 32, T15S, R13E. 26 August 1997. Ryan C. Means and Guy H. Means. Florida Museum of Natural History, Gainesville, Florida (UF 112976). Verified by David Auth. Populations are known from Apalachicola in the Florida panhandle (Means 1996, Herpetol. Rev. 27:152) and Tampa in peninsular Florida (Nelson and Carey 1993, Northeast Gulf Sci. 13:53–58). New county record; helps close the gap in the Floridian Gulf Coastal distribution of this species.

Submitted by **RYAN C. MEANS**, Coastal Plains Institute and Land Conservancy, 1313 North Duval Street, Tallahassee, Florida 32303, USA.

LEPIDODACTYLUS LUGUBRIS (Mourning Gecko). MALDIVES: SOUTH MALE ATOLL: Vadoo (4°07'N, 73°27'E). 6 September 1998. Akira Kikukawa. Zoological Collection of Kyoto University (KUZ 47850). Verified by Hidetoshi Ota. First record for the Maldive Islands. Fills the distributional gap between India (Das 1996, Biogeography of the Reptiles of South Asia. Krieger Publ., Malabar, Florida) and the Chagos Archipelago (Barnett and Emms 1997, British Herpetol. Soc. Bull. 59:6–12). A few other individuals were also observed. Species appears to be rare compared to *Hemidactylus frenatus,* which is already known from the Maldives (Moutou 1985, C. R. Soc. Biogeogr. 61:101–109).

Submitted by **AKIRA KIKUKAWA**, Vadoo Diving Paradise, South Male Atoll, P.O. Box 20159, Republic of Maldives.

LEPOSOMA OSVALDOI. BRAZIL: AMAZONAS: Município de Borba, Santa Bárbara, left bank of Rio Canumó. 9 June 1994. M. S. Hoogmoed. MPEG 16965. Verified by Rubens Nobuo Yuki. First record for the state of Amazonas. Previously known only in the state of Rondónia (Ávila-Pires 1995, Lizards of Brazilian Amazonia [Reptilia: Squamata]. Zoologische Verhandelingen 299:1–706).

Submitted by **GABRIEL SILVA PINTO**, Museu Paraense Emílio Goeldi, Departamento de Zoologia—DZO, Caixa Postal 399, CEP 66040-170, Belém, Pará, Brazil.

PODARCIS ERHARDII (Erhard's Wall Lizard) EUROPE: GREECE: DODECANECE: Pergousa (36°35'E, 27°02'N) and Pachia (36°34'E, 27°04'N) islets west of Nisyros Island. 19 February 1993. Collected by the authors. Museum of Natural His-

tory, University of Crete, Greece, MNHUC E98–E103 (Pergousa) and MNHUC E118–E124 (Pachia). Verified by B. Chondropoulos. First observation of *Podarcis erhardii* east of Middle Aegean Gap. Nearby islands of Nisyros and Gyali, although in close proximity, are characterized by an eastern herpetofauna, where *P. erhardii* is replaced by *Ophisops elegans*.

Submitted by **EFSTRATIOS D. VALAKOS** and **PANAGIOTA MARAGOU**, University of Athens, Department of Biology, Section of Animal & Human Physiology, GR-15784 Panepistimioupolis, Athens, Greece, and **MOYSIS MYLONAS** University of Crete, Department of Biology, P.O. Box 1470, GR 711 10 Iraklio, Greece.

SERPENTES

ATRACTUS TORQUATUS. (Culebra Terrera Roja; Red Burrowing Snake). VENEZUELA: ESTADO BOLÍVAR: Cerro Santa Rosa, 100 km SSE El Manteco, 300 m elev. June 1994. F. García. Museo de Ciencias Naturales, Caracas (MCNC-8034). Verified by L. F. Navarrete. Species was reported for the first time in Venezuela by McDiarmid and Paolillo (1988. *In* Brewer-Carías 1988, Cerro de la Neblina, Resultados de la Expedición 1983–1987. FUDECI, Caracas) from the lower Baría River at the S edge of the country in the state of Amazonas, and noted that the specimen was to be housed in the American Museum of Natural History of New York (no catalogue number given). We report here the first vouchered specimen of this species deposited in a Venezuelan museum, constituting the first locality in the state of Bolivar and extending the distribution of this taxon in the country 800 km to the NE. The presence of this snake in Venezuela is not surprising, as it is distributed through all north Amazonian countries (Hoogmoed 1980, Zool. Verhan., Leiden 175:1–47; Martins and Oliveira 1993, Zool. Meded. Leiden 67[2]:21–40).

Submitted by **CÉSAR LUIS BARRIO**, Fundación para el Desarrollo de las Ciencias Físicas, Matemáticas y Naturales, FUDECI, Apartado Postal 185, Caracas 1010-A, Venezuela (e-mail: fudeci@reacciun.ve), **CHARLES BREWER-CARÍAS**, P.O. Box 90214, El Hatillo, 1083-A Caracas, Venezuela (e-mail: brewerch@ven.net), and **OSWALDO FUENTES**, Instituto de Medicina Tropical-Serpentarium. Apartado Postal 47423, Caracas 1041, Venezuela (e-mail: ofuentes@tyto.ciens.ucv.ve).

BOTHROPS MOOJENI (Brazilian Lancehead). PARAGUAY: DEPARTAMENTO CANINDEYU: Reserva Natural del Bosque de Mbaracayú, "Caseta Lagunita," 24°08'04"S, 55°25'38"W. 6 April 1995. E. Buongermini P., R. Palacios, and U. Svensson. Museo Nacional de Historia Natural del Paraguay (MNHNP 6831). Verified by Marta Motte. First confirmed record for the Oriental Region of Paraguay. One male collected in an abandoned house. Species was mentioned as of probable occurrence in eastern Paraguay based on a photograph (Campbell and Lamar 1989, The Venomous Reptiles of Latin America. Cornell Univ. Press, Ithaca, New York. 425 pp).

Submitted by **EMILIO BUONGERMINI P.**, Museo Nacional de Historia Natural del Paraguay, Sección de Herpetología, Caballero 1060, Asunción, Paraguay, CP 1324 (e-mail: subtropy@infonet.com.py) and **TOMAS WALLER**, Zavalía 2090 3°B, Buenos Aires, Argentina, CP 1428.

DENDROPHIDION DENDROPHIS. BRAZIL: ALAGOAS: Maceió (9°40'S, 35°43'W), Rio Largo (9°30'S, 35°50'W) and Muricí (9°14'S, 35°48'W) in small patches of Atlantic Forest. February 1993–September 1995. E. M. X. Freire. Museu de História Natural, Universidade Federal de Alagoas (MUFAL 327, 429, 1779, 2060, 2245). Verified by R. Fernandes. First record for the northeastern region of Brazil; extends range ca. 1500 km SE of Belém, Pará, Brazil (Cunha and Nascimento 1978, Publ. Avuls. Mus. Par. Emélio Goeldi 31:67–68).

Submitted by **ELIZA MARIA XAVIER FREIRE**, Departamento de Zoologia e Museu de História Natural, Universidade Federal de Alagoas, Rua Aristeu de Andrade, 452, Maceió, Alagoas, 57021-090, Brazil, and Departamento de Vertebrados, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, 20940-040, Brazil.

ELAPHE GUTTATA (Corn Snake). USA: TEXAS: Lee Co: 6.4 km (by road) SW jct. Co. Rd. 123 and FM 141 on FM 141. 17 October 1998. John H. Malone. TCWC 81639. Verified by James R. Dixon. County record; fills distribution gap between Bastrop and Burleson counties. (Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp; Dixon 1996, Ten year supplement to Texas herpetological county records published in Amphibians and Reptiles of Texas, 1987. Texas Herpetol. Soc. Spec. Publ. No. 2).

Submitted by **JOHN H. MALONE**, Herpetological Independent Study Group, Texas A&M University, Department of Wildlife and Fisheries Sciences, College Station, Texas 77843, USA, and **THAD J. WILLIAMS**, Texas A&M University, Department of Wildlife and Fisheries Sciences, College Station, Texas 77843, USA.

ERYTHROLAMPRUS PSEUDOCORALLUS. (Falsa Coral de Maracaibo, Maracaibo's False Coral Snake). VENEZUELA: ESTADO AMAZONAS: Gavilán, a small indigenous village 30 km ENE of Puerto Ayacucho. 3 January 1990. Collected by Piaroa Indians. Museo de Ciencias Naturales, Caracas (MCNC 7676). Verified by O. Álvarez. *Erythrolamprus pseudocorallus* had been recorded previously in the Maracaibo Basin in the states of Zulia and Merida, and was thought to be endemic to this region (Roze 1966, La Taxonomía y Zoogeografía de los Ofidios de Venezuela. Ediciones de la Biblioteca, Universidad Central de Venezuela Caracas. 360 pp.). First report of the species outside of the Maracaibo Basin, about 600 km to the SE; demonstrates a much wider distribution in the country and that the endemicity of the species is invalid for the Maracaibo Basin. Rodríguez-Acosta and Fuentes (1995–96 Terra 11–12[20–21]:77–84) mention the presence of this species in Amazonas, but without further explanation.

Submitted by **OSWALDO FUENTES,** Instituto de Medicina Tropical-Serpentarium, Apartado Postal 47423, Caracas 1041, Venezuela (e-mail: ofuentes@tyto.ciens.ucv.ve) and **CÉSAR LUIS BARRIO**, Fundación para el Desarrollo de las Ciencias Físicas, Matemáticas y Naturales, FUDECI. Apto Postal 185, Caracas 1010-A, Venezuela (e-mail: fudeci@reacciun.ve).

FARANCIA ABACURA REINWARDTII (Western Mud Snake). USA: TEXAS: Fort Bend Co: Brazos Bend State Park, 26.1 km (by air) ESE Rosenberg. 19 September 1998. John H. Malone. TCWC 81641. Verified by James R. Dixon. First live specimen documented from Fort Bend Co. (previous record was based on a fossil specimen; Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp; Dixon 1996, Ten year supplement to Texas herpetological county records published in Amphibians and Reptiles of Texas, 1987. Texas Herpetol. Soc. Spec. Publ. No. 2). Specimen collected under the authority of State Park Scientific Study Permit 60-98.

Submitted by **JOHN H. MALONE**, Herpetological Independent Study Group, Texas A&M University, Department of Wild-

life and Fisheries Sciences, College Station, Texas 77843, USA, **DAVID HEINICKE**, Brazos Bend State Park, 21901 FM 762, Needville, Texas 77461, USA, and **DON WINSOR**, Brazos Bend State Park Volunteer Organization, Brazos Bend State Park, 21901 FM 762, Needville, Texas 77461, USA.

HETERODON SIMUS (Southern Hognose Snake). USA: GEORGIA: TATTNALL CO: Big Hammock Natural Area Preserve (Georgia Department of Natural Resources), ca. 6.9 km SSW Five Points. 2 August 1998. Dirk J. Stevenson. SOCM 1321A-1321D (photos). Verified by Robert A. Moulis. Male (SVL 322 mm, TL 403 mm) found in xeric longleaf pine (*Pinus palustris*)/turkey oak (*Quercus laevis*) sandhill habitat. New county record (Williamson and Moulis 1994, Savannah Sci. Mus. Publ. 3:1–712).

Submitted by **DIRK J. STEVENSON**, Directorate of Public Works, Fort Stewart Fish and Wildlife Branch, 1557 Frank Cochran Drive, Fort Stewart, Georgia 31314, USA.

HYDRODYNASTES GIGAS (Surucucu do Pantanal). BRAZIL: RONDÔNIA: MUNICIPALITY OF PIMENTA BUENO: Asa Branca Farm (ca. 11°46'S, 61°20'W). November 1993. P. Jochen. Museu de História Natural Capão da Imbuia, Curitiba (MHNCI 7083). Verified by S. A. A. Morato. Dry skin; nearly 300 cm TL. First record for the state of Rondônia (Jorge-da-Silva 1993, Herpetol. Nat. Hist. 1:37–86). Extends range to NW Brazil. Specimen is the maximum size reported for the species (Dowling and Gibson 1970, Herpetol. Rev. 2:37–38).

Submitted by **PAULO SÉRGIO BERNARDE** and **JULIO CESAR DE MOURA-LEITE**, Curso de Pós-Graduação em Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil, and Laboratório de Herpetologia, Museu de História Natural Capão da Imbuia, Depto. De Zoológico (SMMA/PMC), Rua Prof. Benedito Conceição, 407-82810-080 Curitiba, Paraná, Brazil.

LAMPROPELTIS TRIANGULUM CELAENOPS (New Mexico Milk Snake) USA: TEXAS: WINKLER CO: DOR, 17.5 km (by road) E Kermit on Texas Rt. 302 (31°52'41.9"N, 102°55'19.6"W). 6 August 1998. Toby J. Hibbitts. TCWC 80002. Verified by James R. Dixon. New county record (Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.).

Submitted by **TOBY J. HIBBITTS**, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA.

LEPTOTYPHLOPS DULCIS DULCIS (Texas Blind Snake) USA: TEXAS: LA SALLE CO: 1.3 km (by road) S jct. Texas Rt. 72 on Texas Rt. 97 (28°29'10.4"N, 98°48'10.8"W). 16 August 1998. Toby J. Hibbitts. TCWC 79977. Verified by James R. Dixon. New county record (Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.).

Submitted by **TOBY J. HIBBITTS**, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA.

LIOPHIS MARYELLENAE. BRAZIL: BAHIA: Ibicoara (13°25'S, 41°17'W). 18 February 1989. Collected at nightfall while moving on the top of a "campo rupestre" (savanna of altitude rocky field). CZGB 568; Iramaia (13°18'S, 41°17'W). 21 February 1989. CZGB 570. Both collected by António J. S. Argôlo, Binael Santos, and Robson Nunes; both verified by Ronaldo Fernandes. These localities are situated between 600 m and 1040 m elevation; extends range over 500 km E from the unique previous record in the state of Bahia (Dixon 1985, Proc. Biol. Soc. Washington 98[2]:299.).

Submitted by **ANTÔNIO JORGE SUZART ARGÔLO**, Universidade Estadual de Santa Cruz—UESC, Km 16 Rodovia Ilhéus-Itabuna, CEP 45650-000, Ilhéus, Bahia, Brazil, and Centro de Pesquisas do Cacau/CEPLAC, Km 22 Rodovia Ilhéus-Itabuna, CEP 45600-000, Ilhéus, Bahia, Brazil.

LIOPHIS POECILOGYRUS. VENEZUELA: ESTADO BOLÍVAR: El Palmar, 60 km E Upata. 1 February 1994. A. Hernández. Museo de Ciencias Naturales, Caracas (MCNC 8036). Verified by D. Briceño; Estación CVG Los Pijiguaos. February 1998. L. Andreani. (MCNC 7893). Verified by L. F. Navarrete. Sabanas de El Manteco, 20 km S El Manteco. March 1995. A. Hernández. (MCNC 8036). Verified by L. F. Navarrete. Dixon (1989 Smithsonian Herpetol. Infor. Serv. 79) pointed out the presence of this species in Venezuela. Dixon and Markezich (1992 Texas J. Sci. 44:131–166) clearly indicated the presence of this taxon in the state of Bolivar, Venezuela on their map (p. 136, two localities), but they did not mention vouchered specimens. We herein provide the first vouchers with precise localities in Venezuela.

Submitted by **OSWALDO FUENTES**, Instituto de Medicina Tropical-Serpentarium, Apartado Postal 47423, Caracas 1041, Venezuela (e-mail: ofuentes@tyto.ciens.ucv.ve) and **CÉSAR LUIS BARRIO**, Fundación para el Desarrollo de las Ciencias Físicas, Matemáticas y Naturales, FUDECI, Apartado Postal 185, Caracas 1010-A, Venezuela (e-mail: fudeci@reacciun.ve).

LIOPHIS SAGITTIFER MODESTUS. ARGENTINA: SANTA FE PROVINCE: Vera Department: Margarita (29°42'S; 60°13'W). 21 November 1972. A. Barrio. Herpetological collection of former Centro Nacional de Iología, now located in the Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina (CENAI 3299, a male 268 mm SVL, 87 mm TL). Verified by G. Couturier. First record for Santa Fe province, extends range ca. 250 km air line E from nearest known population in Santiago del Estero province (Cei 1993, Mus. Reg. Sci. Nat. Torino Monogr. 14:609–610; Dixon 1989, Smithsonian Herpetol. Infor. Serv. 79:22–23; Dixon and Thomas 1982, Herpetologica 38:389–395).

Submitted by **VANESA ARZAMENDIA** and **ALEJANDRO R. GIRAUDO**, FAFODOC, Universidad Nacional del Litoral and Instituto Nacional de Limnología, INALI, CONICET, José Macia 1933, 3016 Santo Tomé, Santa Fe, Argentina

MASTICOPHIS BILINEATUS (Sonoran Whipsnake) USA: NEW MEXICO: CATRON CO: DOR, S side of Pleasanton on US Rt. 180 (33°17'03.1"N, 108°52'41.5"W). 4 August 1998. Toby J. Hibbitts and Terry L. Hibbitts. TCWC 80000. Verified by James R. Dixon. This record extends the range ca. 54 km ENE of Eagle Creek, Greenlee County, Arizona (CM 71184, 70746). Another record exists from the Gila River, Greenlee County, Arizona (CM 71425). This record may be closer to the specimen that we collected, but the data are not precise enough to determine the exact locality (Camper and Dixon 1994, Ann. Carnegie Mus. 63[1]:1–48.). In New Mexico, this species was previously known only from western Hidalgo County (Degenhardt et al. 1996, Amphibians and Reptiles of New Mexico, Univ. New Mexico Press, Albuquerque. xix + 431 pp.)

Submitted by **TOBY J. HIBBITTS**, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA and **TERRY L. HIBBITTS,** 602 Hilltop Circle, Wylie, Texas 75098, USA.

OXYRHOPUS FORMOSUS. VENEZUELA: ESTADO BOLÍVAR: Javillal, Río Caura. 5 October 1993. Colected by Panare indians. Museo de Ciencias Naturales, Caracas (MCNC-8035). Verified by O. Fuentes. Species has a wide distribution in South America east of the Andes and north of 20°S latitude (Peters and Orejas-Miranda 1986, Catalogue of Neotropical Squamata. Part I. Snakes. Smithsonian Inst. Press, Washington). First citation of the species in Venezuela was by McDiarmid and Paolillo (1988. *In* Brewer Carías (ed.), Cerro de la Neblina, Resultados de la Expedición 1983–1987. FUDECI, Caracas) from Río Baría, Estado Amazonas. Our example was found 750 km NNE of the previous known locality and provides evidence that the distribution of *Oxyrhopus formosus* in Venezuela includes all lowlands of the Guianan Shield.

Submitted by **RENATO MATTEI** and **CÉSAR LUIS BARRIO**, Fundación para el Desarrollo de las Ciencias Físicas, Matemáticas y Naturales, FUDECI, Apartado Postal 185, Caracas 1010-A, Venezuela (e-mail: fudeci@reacciun.ve).

OXYRHOPUS GUIBEI (False Coral Snake). BRAZIL: ALAGOAS: Muricí (9°14'S, 35°48'W) and Rio Largo (9°30'S, 35°50'W) in small patches of Atlantic Forest. September–October 1995. E. M. X. Freire. Museu de História Natural, Universidade Federal de Alagoas (MUFAL 1390, 1561, 1825), and Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ 6724–25). Verified by U. Caramaschi. First record for the Northeastern Region of Brazil; extends range ca. 1000 km NE of Minas Gerais, Brazil (Zaher and Caramaschi 1992, Bull. Mus. natl. Hist. nat. 4, Sér. 14:805–827).

Submitted by **ELIZA MARIA XAVIER FREIRE**, Departamento de Zoologia e Museu de História Natural, Universidade Federal de Alagoas, Rua Aristeu de Andrade, 452, Maceió, Alagoas, 57021-090, Brazil, and Departamento de Vertebrados, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, 20940-040, Brazil.

PHILODRYAS BARONI (Baron's Racer). ARGENTINA: SANTA FE PROVINCE: 9 de Julio Department: Pozo Borrado (28°56'S, 61°44'W). 19 February 1969. M. Mendoza. Herpetological collection of former Centro Nacional de Iología, now located in the Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina (CENAI 2762, a female 1230 mm SVL). Verified by A. Giraudo. First record for Santa Fe province; extends range ca. 150 km airline E from nearest known population in Santiago del Estero province (Cei 1993, Mus. Reg. Sci. Nat. Torino Monogr. 14:632–635). Species previously known from Tucumán, Salta, Catamarca, Córdoba, Chaco, and Santiago del Estero provinces in Argentina (Cei 1993, *op. cit.*; Williams and Francini 1991, Boll. Mus. Reg. Sci. Nat. Torino 9:74).

Submitted by **VANESA ARZAMENDIA**, FAFODOC, Universidad Nacional del Litoral and Instituto Nacional de Limnología, INALI, CONICET, José Macia 1933, 3016 Santo Tomé, Santa Fe, Argentina.

PHILODRYAS LIVIDA. BRAZIL: GOIÁS: Municipality of Mineiros, Pargue Nacional das Emas (18°20'S, 53°00'W, 760–880 m elev.). 26 July 1997. M. B. Ramos Neto. (Instituto Butantan, São Paulo, Brazil, IB 57338). Verified by F. L. Franco. Species is known from 19 specimens from twelve localities in the states of São Paulo and Mato Grosso do Sul (Thomas and Fernandes 1996, Herpetologica 52:271–275). Formerly known as *Platyinion lividum* Amaral (1923); has been recently placed in the genus *Philodryas* Wagler (1830) by Thomas and Fernandes (1996, *op. cit.*). First state record; extends range about 150 km northward.

Submitted by **PAULA H. VALDUJO** and **CRISTIANO NOGUEIRA**, Seção de Herpetologia, Instituto Butantan. Avenida Vital Brasil, 1500, CEP 05503-900, São Paulo, São Paulo, Brazil and Departamento de Ecologia Geral, Instituto de Biociências, Universidade de São Paulo, Caixa Postal 11461, CEP 05422-970, São Paulo, São Paulo, Brazil.

SONORA SEMIANNULATA (Ground Snake). USA: ARIZONA: Coconino Co: Wupatki National Monument. 9 June 1951. Pierson. University of Arizona Herpetology Collection (UAZ 26371–72). Verified by George Bradley. First Arizona records north of the Mogollon Rim outside of the Inner Gorge of the Grand Canyon, and first record for the Little Colorado River basin. Extends range ca. 80 km SE of nearest records in Grand Canyon National Park, and ca. 115 km NNE of nearest populations in Yavapai County (Fowlie 1965, The Snakes of Arizona. McGraw Hill, New York. 164 pp.; Frost 1983, Cat. Am. Amphib. Rept. 333:1–4). This record suggests the species could be found almost anywhere in the southern Colorado Plateau region of NE Arizona, NW New Mexico, SE Utah, and SW Colorado.

Submitted by **TREVOR PERSONS**, U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Colorado Plateau Field Station, Northern Arizona University, P.O. Box 5614, Flagstaff, Arizona, 86011-5614, USA.

TAENIOPHALLUS BREVIROSTRIS. BRAZIL: ACRE: PORTO WALTER: Igarapí São Luiz (8°50'17"S 72°54'23"W). D. Oren, F. S. Braga and D. Pimentel. 24 April 1996. Departamento de Zoologia, Museu Paraense Emílio Goeldi. MPEG 19031. Verified by Ulisses Galatti. First record for the state of Acre (Myers 1974, Bull. Am. Mus. Nat. Hist. 153[1]:1–262; Cunha and Nascimento 1978, Pub. Avulsas Mus. Goeldi 31:1–218; Cunha and Nascimento 1993, Bol. Mus. Para. Emílio Goeldi, Sér. Zool. 9[1]:1–191 [= *Rhadinaea brevirostris*]; Di-Bernardo 1992, Comun. Mus. Ciénc. Tecnol. PUCRS, sér. zool. 5[13]:225–256; Silva-Jr. 1993, Herpetol. Nat. Hist. 1:37–86) [= *Echinanthera brevirostris*]).

Submitted by **RUBENS NOBUO YUKI**, Departamento de Zoologia, Museu Paraense Emílio Goeldi, CP 399, Cep: 66040-170, Belém, Pará, Brazil.

TANTLLITA LINTONI (Linton's Dwarf Short-tail Snake). NICARAGUA: JINOTEGA: Reserva Biosfera BOSAWAS, ca. 3 km S Ayapal at Río Curinwas, 200 m elev. (12°46.62'N, 85°23.17'W). 14 February 1998. G. Köhler. Forschungsinstitut und Naturmuseum Senckenberg (SMF 78606). Verified by L. D. Wilson. First record for Nicaragua; extends range ca. 250 airline km SE of record from mountains above Corozal, Departamento Atlántida, Honduras (Wilson and Meyer 1985, The Snakes of Honduras. 2nd Edition. Publ. Milwaukee Publ. Mus. 150 pp.).

Submitted by **GUNTHER KÖHLER**, Forschungsinstitut und Naturmuseum Senckenberg, Sektion Herpetologie, Senckenberganlage 25, D-60325 Frankfurt a.M., Germany.

TROPIDODRYAS SERRA. BRAZIL: BAHIA: Santa Cruz Cabrália: Estação Ecológica do Pau Brasil (CEPLAC/ESPAB) (15°40'S 38°58'W) 0-100 m elev. 3 May 1995. Laurindo Xavier and António Cosme. Coleção Zoológica Gregório Bondar of the Centro de Pesquisas do Cacau (CZGB 3698). Verified by Ronaldo Fernandes. Specimen was found during the morning on the ground on the border of a primary forest. Species is found in northeastern, central, and southeastern Brazil (Amaral 1978, Serpentes do Brasil, Melhoramentos/ Universidade de São Paulo, 2 ed. São Paulo. 246 pp.). Two specimens already known from Bahia have

no specific locality (Thomas and Dixon 1977, Pearce-Sellards Ser. Texas Mem. Mus. 27:1–20). According to these authors, the specimen referred to *T. serra* by Günther (1861, Proc. Zool. Soc. London 12–18) may be *T. striaticeps*. This individual had been found in Ilhéus (14°47'S, 39°03'W), 0–50 m elev. However, despite twelve years collecting in this region, the species has never been found there (Argolo, pers. obs.). To the contrary, *T. striaticeps* occurs 160 km west, at localities that are at least 640 m above sea level (Argôlo, pers. obs.). These data suggest that the specimen reported by Günther (*op. cit.*) could in fact be *T. serra*. The record from Santa Cruz Cabrália confirms the occurrence of *T. serra* in the state of Bahia, where the species is, apparently, rare.

Submitted by **ANTÔNIO JORGE SUZART ARGÔLO**, Universidade Estadual de Santa Cruz—UESC, Km 16 Rodovia Ilhéus-Itabuna, CEP 45650-000, Ilhéus, Bahia, Brazil, and Centro de Pesquisas do Cacau/CEPLAC, Km 22 Rodovia Ilhéus-Itabuna, CEP 45600-000, Ilhéus, Bahia, Brazil.

TROPIDODRYAS STRIATICEPS. BRAZIL: BAHIA: Barra do Choça (14°52'S, 40°39'W): Recanto da Adriana farm. 24 September–21 December 1997. J. O. Ruas. Coleção Zoológica Gregório Bondar of the Centro de Pesquisas do Cacau/CEPLAC (CZGB 6237–38); 1 January–28 February 1998. J. O. Ruas. CZGB 6508; 1 March–7 April 1998. J. O. Ruas. CZGB 6588, 6590; Juritî farm. 1 April–2 May 1988. P. A. Souza. CZGB 7077; 3 May–11 July 1998. P. A. Souza. CZGB 7440; Ribeirão do Largo (15°28'S, 40°45'W); Boa Sorte farm. 1 January–28 February 1998. Collector unknown. CZGB 6419; 1 April–3 May 1998. Collector unknown. CZGB 7082. All verified by Ronaldo Fernandes. All localities are situated between 640 and 860 m above sea level and harbour deciduous and semideciduous seasonal Atlantic rainforests as well as evergreen Atlantic rainforest. First records to the Brazilian northeast; extend range ca 500 km N from the previous known limit (Thomas and Dixon 1977, Pearce-Sellards Ser. Texas Mem. Mus. 27:1–20).

Submitted by **ANTÔNIO JORGE SUZART ARGÔLO**, Universidade Estadual de Santa Cruz—UESC, Km 16 Rodovia Ilhéus-Itabuna, CEP 45650-000, Ilhéus, Bahia, Brazil, and Centro de Pesquisas do Cacau/CEPLAC, Km 22 Rodovia Ilhéus-Itabuna, CEP 45600-000, Ilhéus, Bahia, Brazil.

VIRGINIA VALERIAE (Smooth Earth Snake). USA: TEXAS: Nacogdoches Co: A decapitated *Virginia valeriae* and a *Coluber constrictor* were regurgitated by an adult *Micrurus* captured on Melwood Circle in Nacogdoches, Texas, on 10 October 1997. The specimen of *Virginia valeriae* is a new county record (Dixon 1987, Amphibians and Reptiles of Texas, Texas A&M Press, College Station. 434 pp.). J. Howard Williamson. TCWC 81519. Verified by James R. Dixon.

Submitted by **DANIEL SAENZ, CHRISTOPHER S. COLLINS, TONI TREES,** and **J. HOWARD WILLIAMSON,** Wildlife Habitat and Silviculture Laboratory, Southern Research Station, USDA Forest Service, Nacogdoches, Texas 75962, USA.

WAGLEROPHIS MERREMII (Boipeva). BRAZIL: RONDÔNIA: Municipality of Vilhena (12°44'26"S, 60°08'45"W, elev. 600 m). December 1993. D. do R. Benedini. Museu de História Natural Capão da Imbuia, Curitiba (MHNCI.7401). Verified by S. A. A. Morato. Young male; 235 mm TL. Species is known from some Amazonian localities (Gasc and Rodrigues 1980, Bull. Mus. Natl. Hist. Nat. Paris 4e Ser. 2[2]:559–598; Chippaux 1986, Les Serpents de la Guyane Française, Paris, Coll. Faune Tropicale 27:165 pp.), but this is the first record for the state of Rondônia (Jorge-da-Silva 1993, Herpetol. Nat. Hist. 1:37–86). Extends range to NW Brazil. Vilhena region is characterized by the contact between "Cerrado" (open arboreal savanna) and "Floresta Estacional Semidecidual" (semideciduous forest) formations (Brasil, Fundação IBGE 1988, Mapa da Vegetação do Brasil).

Submitted by **JULIO CESAR DE MOURA-LEITE** and **PAULO SÉRGIO BERNARDE**, Curso de Pós-Graduação em Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil, and Laboratório de Herpetologia, Museu de História Natural Capão da Imbuia, Departamento de Zoológico (SMMA/PMC), Rua Prof. Benedito Conceição, 407 - 82810-080 Curitiba, Paraná, Brazil.

XENODON NEUWIEDII. BRAZIL: BAHIA: Barra do Choça (14°52'S, 40°39'W), Juritî farm. January–February 1998. P. A. Souza. Coleção Zoológica Gregório Bondar of the Centro de Pesquisas do Cacau/CEPLAC (CZGB 6435); February–April 1998. P. A. Souza. CZGB 7025; April–2 May 1998. P. A. Souza. CZGB 7075; 12 July–26 September 1998. P. A. Souza. CZGB 7650-51; Recanto da Adriana farm (14°57'S, 40°33'W). March-April 1998. J. O. Ruas. CZGB 6580–82; 7 April-12 June 1998. J. O. Ruas. CZGB 7191; 12 June–11 July 1998. J. O. Ruas. CZGB 7455. All verified by Ronaldo Fernandes. All individuals were found at coffee farms, up to 800 m elevation and with remnants of deciduous and semideciduous mesophytic Atlantic rainforests. Northermost record of species in Brazil, where it has been reported only from the central, southeast, and southern sections (Peters and Orejas-Miranda 1970, Bull. U.S. Nat. Mus. 297:133).

Submitted by **ANTÔNIO JORGE SUZART ARGÔLO**, Universidade Estadual de Santa Cruz—UESC, Km 16 Rodovia Ilhéus-Itabuna, CEP 45650-000, Ilhéus, Bahia, Brazil, and Centro de Pesquisas do Cacau/CEPLAC, Km 22 Rodovia Ilhéus-Itabuna, CEP 45600-000, Ilhéus, Bahia, Brazil.

New Records of Amphibians from Parque Estadual do Rio Doce, State of Minas Gerais, Brazil

RENATO N. FEIO
PATRÍCIA S. SANTOS
Museu de Zoologia João Moojen de Oliveira
Departamento de Biologia Animal
Universidade Federal de Viçosa, 36.571-000, Viçosa, MG, Brazil
e-mail (RNF): rfeio@mail.ufv.br

and

ULISSES CARAMASCHI
Departamento de Vertebrados, Museu Nacional - Quinta da Boa Vista
Universidade Federal do Rio de Janeiro, 20.940-040, Rio de Janeiro, RJ, Brazil
e-mail: ulisses@acd.ufrj.br

During the last ten years, several collections and studies of anurans in the Parque Estadual do Rio Doce (19°48' and 19°29'S, 42°38' and 42°28'W), in southeastern part of the state of Minas Gerais, Brazil, have been conducted by us, resulting in new records of distribution of some species. All of them are typical of the east coast of Brazil and are known only from this region (Frost 1985). The Parque Estadual do Rio Doce represents the first recordings of this species in Minas Gerais territory and the most inland registered in Brazil, amplifying significantly the distribution of these species. All records are based on specimens deposited in the herpetological collections of the Museu de Zoologia João Moojen de Oliveira (MZUFV) at Universidade Federal de Viçosa, Viçosa, Minas Gerais, and Museu Nacional, in Rio de Janeiro

(MNRJ). The identifications are verified by J. P. Pombal Jr. (Curator, MNRJ).

Aparasphenodon brunoi. Marliéria Municipality: Parque Estadual do Rio Doce, Porto Capim. 10 October 1992. R. N. Feio, L. G. Cotta and L. W. F. Assad. MZUFV 714; Marliéria Municipality: 13 January 1994. R. N. Feio. MZUFV 1551–52; 5 December 1995. R. N. Feio, U. M. L. Braga and H. C. Wiederhecker. MZUFV 2630; 23 November 1996. R. N. Feio and P. S. Santos. MZUFV 2761–2762, MNRJ 20873.

Sphaenorhynchus prasinus. Marliéria Municipality: Parque Estadual do Rio Doce. 13 January 1994. R. N. Feio. MZUFV 1553-54; 5 December 1995. R. N. Feio, H. C. Wiederhecker and U. M. L. Braga. MZUFV 2631-2633, MNRJ 20874-20875.

Osteocephalus langsdorffii. Marliéria Municipality: Parque Estadual do Rio Doce, Porto Capim. 23 October 1993. R. N. Feio and L. W. F. Assad. MZUFV 1426, MZUFV 1509; 17 Setember 1994. R. N. Feio. MZUFV 2102; 31 August 1995. R. N. Feio, C. Casali, H. C. Wiederhecer, and P. S. Santos. MZUFV 2420; 23 November 1996. R. N. Feio, U. M. L. Braga, H. C. Wiederhecker, and P. S. Santos. MNRJ 20876.

Leptodactylus spixii. Marliéria Municipality: Parque Estadual do Rio Doce, Lagoa Carioca. 13 January 1994. R. N. Feio. MZUFV 1563; 23 November 1996. R. N. Feio, H. C. Wiederhecker, U. M. L. Braga, and P. S. Santos. MZUFV 2781.

Stereocyclops incrassatus. Marliéria Municipality: Parque Estadual do Rio Doce. 10 October 1992. R. N. Feio, L. G. Cotta, and L. W. F. Assad. MZUFV 733. 6 November 1994. R. N. Feio. MZUFV 2263.

Acknowledgments.—We thank Helga Wiederhecker, Úrsula M. L. Braga, Cristiano Casali, José L. Pontes, Lício W. F. Assad and Lucianno G. Cotta, for collecting assistance. Instituto Estadual de Florestas, Minas Gerais, for funding and permission to collect in the Parque Estadual do Rio Doce.

LITERATURE CITED

FROST, D. R. (ED.). 1985. Amphibian Species of the World. A Taxonomic and Geographical Reference. Allen Press. Inc., and Assoc. Systematics Collections, Lawrence, Kansas. 732 pp.

Railway-Aided Dispersal of an Introduced *Podarcis muralis* Population

STANLEY E. HEDEEN
Department of Biology, Xavier University
Cincinnati, Ohio 45207, USA
e-mail: hedeen@xavier.xu.edu

and

DAVID L. HEDEEN
Department of Entomology and Applied Ecology, University of Delaware
Newark, Delaware 19717, USA
e-mail: hedeen@udel.edu

The European wall lizard, *Podarcis muralis*, is native to southern and central Europe and northwestern Asia Minor. Within its geographical range, the species frequents rock faces, sparse woodlands, and landscapes modified by human habitation. Hospitable urban habitats include debris piles of stones and brush, unmortared brick and fieldstone walls, and rock ballast and splintered wooden ties in railroad right-of-ways (Arnold and Burton 1978; Hedeen 1984; Street 1979).

Several thousand *Podarcis muralis* occupy these urban habitats within the metropolitan area of Cincinnati, Ohio, USA (Kwiat and Gist 1987; Brown et al. 1995). The animals are the descendants of two lizards that were deliberately introduced from Italy in 1951 (Hedeen 1984; Vigle 1977). The purpose of this note is to report on the dispersal of this population.

The range expansion of an introduced species is by two modes: diffusion and jump-dispersal (Pielou 1979). Diffusion is a population's gradual spread over a period of several generations. Jump-dispersal is the rapid movement of individual organisms over large distances, followed by the establishment of satellite populations at the destinations. The two modes have been combined during the range expansions of many introduced plant (Baker 1986), insect (Simberloff 1986), and fish (Ehrlich 1986) species.

Jump-dispersal of introduced *Podarcis muralis* occurred as humans captured lizards from the area of colonization and established satellite populations in Ohio (Hedeen 1988) and Kentucky (Draud and Ferner 1994). The major mode of spread, however, has been by diffusion from the release site of the two founding lizards in a backyard between Melville Lane and Torrence Court. The founders' descendants have dispersed in all directions into the surrounding area, causing the neighborhood to become known as Lizard Hill.

At a distance of 400 m south of the original release site, the spreading population reached a northern bend of an east-west railroad right-of-way. From this bend between Lewis Street and Waterloo Avenue, the population diffused at least 1.0 km west along the railroad tracks toward downtown Cincinnati. However, by 1997, the lizards' western limit along the tracks had shrunk to a point 200 m west of the bend. The factors causing this range shrinkage are unknown.

The population also spread along the railroad tracks east from the bend, reaching a distance of at least 5.6 km by 1977. At a junction 6.9 km east of the bend, the lizards encountered tracks running north that split from the tracks continuing east. By 1997, the growing population had spread from the junction 2.5 km along each set of tracks, reflecting a uniform rate of dispersal along each roadbed.

The lizards diffused from the right-of-way into adjacent residential and commercial districts. In 1997, the greatest known distance of lizards from the railroad tracks was 2.4 km. The population's diffusion through residential and commercial areas has been comparatively slow, since hospitable habitats are separated by inhospitable habitats such as streets, parking lots, lawns, and dense stands of trees. Population spread has been more rapid along the continuous hospitable terrain provided by the railway's rock ballast and wooden ties.

Railroad right-of-ways limit the range expansion of some animals (Hengeveld 1989), but serve as favorable habitat corridors that accelerate the dispersal of other animals (Johnson and Choromanski-Norris 1992) as well as plants (Foy et al. 1983). Railway routes have aided the dispersal of *Podarcis muralis* in the Cincinnati area.

LITERATURE CITED

ARNOLD, E. N., AND J. A. BURTON. 1978. A Field Guide to the Reptiles and Amphibians of Britain and Europe. Collins, London. 272 pp.

BAKER, H. G. 1986. Patterns of plant invasion in North America. *In* H. A. Mooney and J. A. Drake (eds.), Ecology of Biological Invasions of North America and Hawaii, pp. 44–57. Springer-Verlag, New York.

BROWN, R. M., D. H. GIST, AND D. H. TAYLOR. 1995. Home range ecology

of an introduced population of the European wall lizard *Podarcis muralis* (Lacertilia; Lacertidae) in Cincinnati, Ohio. Amer. Midl. Nat. 133:344–359.

DRAUD, M., AND J. FERNER. 1994. Geographic Distribution. *Podarcis muralis*. Herpetol. Rev. 25:33.

EHRLICH, P. B. 1986. Which animal will invade? *In* H. A. Mooney and J. A. Drake (eds.), Ecology of Biological Invasions of North America and Hawaii, pp. 79–95. Springer-Verlag, New York.

FOY, C. L., D. R. FORNEY, AND W. E. COOLEY. 1983. History of weed introductions. *In* C. L. Wilson and C. L. Graham (eds.), Exotic Plant Pests and North American Agriculture, pp. 65–92. Academic Press, New York.

HEDEEN, S. E. 1984. The establishment of *Podarcis muralis* in Cincinnati, Ohio. Herpetol. Rev. 15:70–71.

_____. Geographic Distribution. *Podarcis muralis*. Herpetol. Rev. 19:19.

HENGEVELD, R. 1989. Dynamics of Biological Invasions. Chapman and Hall, London. 160 pp.

JOHNSON, S. A., AND J. CHOROMANSKI-NORRIS. 1992. Reduction in the eastern limit of the range of the Franklin's ground squirrel (*Spermophilus franklinii*). Amer. Midl. Nat. 128:325–331.

KWIAT, G. A., AND D. H. GIST. 1987. Annual reproductive cycle of an introduced population of European wall lizards (*Podarcis muralis*) in Ohio. J. Herpetol. 21:205–209.

PIELOU, E. C. 1979. Biogeography. John Wiley, New York. 351 pp.

SIMBERLOFF, D. 1986. Introduced insects: A biogeographic and systematic perspective. *In* H. A. Mooney and J. A. Drake (eds.), Ecology of Biological Invasions of North America and Hawaii, pp. 3–26. Springer-Verlag, New York.

STREET, D. 1979. The Reptiles of Northern and Central Europe. B. T. Batsford Ltd., London. 268 pp.

VIGLE, G. O. 1977. The history and distribution of an introduced population of *Lacerta muralis* (Reptilia, Sauria, Lacertidae) in Cincinnati, Ohio. Herpetol. Rev. 8(3) Supplement 19.4.

New Missouri Amphibian and Reptile Distribution Records from a Catalogued College Teaching Collection

GEOFFREY R. SMITH
and
LINDA D. JOHNSON
Department of Biology, William Jewell College
500 College Hill, Liberty, Missouri 64068, USA
e-mail (GRS): smithg@william.jewell.edu

Although the distributions of many Missouri amphibians and reptiles are well known and well documented throughout the state, many other species have potentially widespread distributions throughout the state but are poorly documented, particularly around the edges of their expected distributions (see Johnson 1987; Powell and Daniel 1997). One region of relatively poor documentation includes the counties just north of the Missouri River (see maps in Johnson 1987; see also Powell and Daniel 1997). These counties often form the northern border of expected distributions of many species, perhaps because of the natural barrier of the Missouri River.

Here we document several new county records for amphibians and reptiles in Missouri, with many of these records coming from counties immediately north of the Missouri River. These records were obtained from the teaching collection of William Jewell College (WJCTC). All records confirmed by J. E. Rettig.

ANURA

Bufo woodhousii fowleri (Fowler's Toad). Camden Co: Sec. 29, T38N, R17W. 18 May 1962. I. Hirano. WJCTC 6302. New county record from a zone of potential intergradation between *B. woodhousii woodhousii* and *B. woodhousii fowleri* (see Johnson, 1987).

Hyla versicolor/chryscocelis Complex (Gray Treefrog). Clay Co: Liberty, Cemetary at William Jewell College, Sec. 8, T51N, R31W. 23 May 1967. C. Smith. WJCTC 1737. New county record for complex (i.e., neither *H. versicolor* nor *H. chryscocelis* have been documented in this county).

Rana areolata (Crawfish Frog). Jasper Co: on Hwy. 171. 5 May 1962. M. Armstrong. WJCTC 821. New county record, filling gap in distribution.

Rana blairi (Plains Leopard Frog). Clay Co: Liberty near bridge over Missouri River, Sec. 18, T54N, R30W. 5 May 1962. G. Newton. WJCTC 6184. New county record.

LACERTILIA

Cnemidophorus sexlineatus (Six-lined Racerunner). Clay Co: Shoal Creek at Wabash RR. 5 July 1950. L. J. Gier. WJCTC 1591. New county record at N edge of expected distribution in Missouri. Clinton Co: Hufft Farm, Sec. 17, T54N, R30W. 5 May 1962. G. Netwon. WJCTC 6196. New county record at extreme N edge of expected distribution in Missouri.

Eumeces fasciatus (Five-lined Skink). Morgan Co: Sec. 9, T40N R18W. 21 April 1962. A. Miller. WJCTC 6256. New county record, filling hole in Missouri distribution.

Scincella lateralis (Ground Skink). Clay Co: on mud bank along stream, Sec. 34, T52N, R31W. 13 May 1967. F. Johannsen. WJCTC 1729. New county record, extends documented range in Missouri NE by > 40 km.

SERPENTES

Carphophis amoenus vermis (Western Worm Snake). Clay Co: under rock in field, Sec. 34, T52N, R31W. 13 May 1967. F. Johannsen. WJCTC 1707. New county record, filling hole in Missouri distribution.

Heterodon platirhinos (Eastern Hognose Snake): Hickory Co: Pomme de Terre Lake, Sec. 35, T37N, R22W. 3 May 1964. A. Lewis. WJCTC 1228. New county record, filling hole in center of Missouri distribution.

Nerodia erythrogaster transversa (Blotched Water Snake). Clay Co: Cooley Lake, SE 1/2 SE 1/4 Sec 2 T51N R30W. 1968. J. Littleford. WJCTC 1839. New county record.

Nerodia rhombifer (Diamondback Water Snake). Clay Co: By old Missouri River channel, Sec. 28, T51N, R31W. 15 May 1965. J. Bean. WJCTC 1464. New county record.

Opheodrys aestivus (Rough Green Snake). Hickory Co: Pomme de Terre Lake, Sec. 35, T37N, R22W. 3 May 1964. M. Wood. WJCTC 1236. New county record, filling hole in Missouri distribution.

Thamnophis proximus (Western Ribbon Snake). Clay Co: Cooley Lake, Sec 2, T51N, R30W. 20 May 1967. G. Beets. WJCTC 1711. New county record.

Thamnophis radix radix (Eastern Plains Garter Snake). Clay Co: near old Missouri River Channel, Sec 28, T51N, R31W. 8 May 1965. J. Bean. WJCTC 1470. New county record.

Tropidoclonion lineatum (Lined Snake). Ray Co: Sec. 32, T53N, R29W. 29 April 1962. J. Eddington. WJCTC 6341. New county record.

In addition to the information provided on amphibian and reptile distributions, these records point out the value of small college teaching collections. Many small colleges have collections of vertebrates (and invertebrates) for use in the classroom or in laboratories which are often the result of the efforts of broadly trained natural historians who worked at these small colleges during the middle part of the 20th century. If records have been kept and specimens properly labeled and preserved, such collections may contain a wealth of distributional data, as well as historical information useful for assessing population persistence. These collections may also come from relatively uncollected areas. For example, the WJCTC increased the known county records for reptiles in Clay County by 35% (from 20 to 27). Thus we suggest herpetologists at small colleges examine their teaching collections for possible distribution records.

Acknowledgments.—This note is dedicated to all the excellent natural historians who have taught at small colleges over the years, and in particular C. Newlon of William Jewell College, and J. B. Cope and the late G. Ward of Earlham College, for their influence on one or both of us. J. Rettig made helpful comments on an earlier version of this manuscript.

LITERATURE CITED

JOHNSON, T. R. 1987. The Amphibians and Reptiles of Missouri. Missouri Dept. Conserv., Jefferson City, Missouri. xi + 368 pp.

POWELL, R., AND R. DANIEL. 1997. County distribution records of amphibians and reptiles in Missouri. Missouri Herpetol. Assoc. Newsletter 10:12–69.

BOOK REVIEWS

A Field Guide to Reptiles and Amphibians of Eastern and Central North America, by Roger Conant and Joseph T. Collins. 1998. Houghton Mifflin Company, Boston and New York. Peterson Field Guide Series. Third edition, expanded. xviii + 616 pp., 48 color plates, 101 color photographs, 333 maps. Softcover US $20.00. ISBN 0-395-90452-8.

ROBERT POWELL
Department of Natural Sciences, Avila College
Kansas City, Missouri 64145, USA
e-mail: powellr@mail.avila.edu

The Peterson Field Guides to North American amphibians and reptiles are modern classics responsible for introducing many individuals to herpetology. They remain the most useful tools a herpetologically inclined person can take into the field. High quality illustrations indicating diagnostic characters, accurate maps, and cogent descriptions render these volumes superior to their competitors. All of the relevant features, good and bad, of the third edition of the "eastern" guide were discussed in detailed reviews by Mitchell (1992) and Good (1992), and I am not inclined to repetition. However, the recent publication of an "expanded" third edition warrants comment.

Although the description of new species, new introductions into the region, nomenclatural changes, and reevaluations of the status of subspecies since the publication of the original third edition in 1991 might suggest a need for a fourth edition, neither the text nor the plates have been changed. Consequently, the content is nearly a decade out of date (the "western" guide by Robert Stebbins is even more critically in need of revision). What has been altered in this expanded edition is the appearance and size of the book. This has resulted primarily from incorporating over 100 color photographs of selected taxa (credited on pages 595–596) and, to a lesser extent, the reorganization of the volume. Whether these changes were warranted or necessary is largely a matter of taste, as both positives and negatives accrued as a result.

On the positive side of the ledger, the book is much more attractive. Because one of the major groups at which the volume is directed consists of "amateurs," who are most likely to be influenced by appearance, this may have been the major motivation for the expansion. Nevertheless, glossy paper throughout, extensive use of color (including headers, frontice pieces, and maps), and generally high quality (some quite exquisite) photographs will be appreciated by even the most jaded "professional." Also positive was the relocation of the maps from the back of the book to close proximity of the relevant text. Although this precludes an easy comparison of ranges facilitated by the older format, most users will appreciate not having to flip between text and maps.

On the downside, the book has grown to an extent to which it is no longer easily carried in the field, presumably where it is to be most frequently used. Because color photographs, admittedly attractive, are provided for only some taxa, they contribute considerably less to the diagnosis of animals than the plates, which are still grouped, albeit now in the front of the book. Also, the relocation of the maps has caused many of them to be downsized, often to a degree where detail is lost and, as a result, a loss of utility is experienced. Amphibians and reptiles, unlike birds and even mammals, are relatively sedentary, so accurate maps are possible and frequently important, as geographic origin is critical for the proper identification of many taxa (this will become even more of a factor with a fourth edition which will include even more cryptic forms not otherwise easily distinguishable).

Was this expansion necessary? No, except as a marketing device. Instead, the publisher invested considerable time and money, when only a little more would have truly improved the product. Not only could a fourth edition have incorporated the cosmetic changes made herein, the composition of the regional herpetofauna, the taxonomy, and the distributions would have been current. Some concerns raised by previous reviewers (e.g., treatment of subspecies, common names, and the missed opportunity to educate users regarding the dynamic nature of systematics at all levels by including a few citations and explanatory remarks) could have been addressed. The size issue might be avoided by producing separate volumes on amphibians and reptiles, allowing all taxa to be illustrated with photographs and maps to be larger. Also, the omission in some maps of extralimital regions (e.g., the West Indies and large portions of México) would allow those portions of the range in the United States to be enlarged and imbued with greater detail. In addition, with the use of glossy paper throughout, plates could be inserted individually near maps and text, enhancing the utility of the book immensely.

Should you run to the nearest bookstore and buy one? Maybe. Make the effort only if you don't have an intact copy of the 1991 publication. However, if your copy is falling apart or you never got around to buying one, and in spite of my critical remarks, you will not find at any price a more useful, accurate, and attractive volume for identifying amphibians and reptiles in the eastern and central United States and Canada.

LITERATURE CITED

MITCHELL, J. C. 1992. Book Review: A Field Guide to Reptiles and Amphibians of Eastern and Central North America, by Roger Conant and Joseph T. Collins. Herpetol. Rev. 23:29–31.

GOOD, D. A. 1992. Book Review: A Field Guide to Reptiles and Amphibians of Eastern and Central North America, by Roger Conant and Joseph T. Collins. Herpetol. Rev. 23:31–32.

The Bone Sharp. The Life of Edward Drinker Cope, by Jane Pierce Davidson. 1997. Academy of Natural Sciences of Philadelphia Special Publication No. 17, Academy of Natural Sciences, 1900 Benjamin Franklin Parkway, Philadelphia, Pennsylvania 19103-1195, USA. 237 pp., black and white portrait + 10 illustrations. Softcover, US $25.00. ISBN 0-910006-53-9.

C. KENNETH DODD, JR.
U.S. Geological Survey, Florida Caribbean Science Center
7920 N.W. 71st Street, Gainesville, Florida 32653, USA
e-mail: Ken_Dodd@usgs.gov

In his lifetime, Edward Drinker Cope sparked intensive debate involving both style and substance. He will always be remembered for his voluminous contributions to herpetology (Adler 1989), paleontology, ichthyology, and other scientific disciplines. Less known, and perhaps with good reason, are his views on women (he opposed suffrage and thought women incapable of directing their affairs without masculine guidance), questions of race (he was clearly a white supremacist), his neo-Lamarckian approach to evolution, and his financial failures. As the namesake of the journal *Copeia*, we are reminded of him every time we consult its pages. His ego was immense and self-serving, his energy and knowledge unbounded, his ability to carry a grudge legendary, and his devotion to his daughter unquestioned, despite a long separation from his wife. With such a complex, prolific, and important figure in late 19th Century science, it is surprising perhaps that more has not been written about him. Davidson's book, issued on the centennial of his death, both assists and falls short of helping bring his persona to light.

The book is composed of eight chapters. The first four chapters trace Cope's early life and professional development (Cope's Early Life, The 1860s, Field Research in the 1870s and 1880s,Wading in the Marshiana: the Cope-Marsh War). The second four chapters are meant to provide a personal glimpse of Cope and how he was perceived by his family, friends and colleagues (Cope's Life with his Wife and Daughter, Cope's Contemporaries on Cope, What Happened at the End, Cope on Human Evolution, Society, and Religion). The book contains three appendices tracing the Cope family genealogy, the Cope-Hayden correspondence, and a glossary of important persons in Cope's life. As interesting as the text may be, I often found the Notes, comprising 28 pages of small type text, to be far more engrossing. Much of this information should have been included in the main body of the text. One cannot read the text without often referring to the Notes.

Davidson clearly conducted an exhaustive amount of background research in delving into Cope's life. Much of this information is contained in the archives of the Academy of Natural Sciences and the American Museum of Natural History. She read so much of Cope's writing that she was able to discern differences in the pattern of his scrawl, to note that the handwriting became even more illegible the more excited or agitated he became. Interpretation is a difficult art, however, and although I found myself in agreement with many of her interpretations (such as the origin of the Cope-Marsh feud and Cope's manipulation of his father), other explanations are possible for some of his more erratic behavior and obsessions. For example, no matter how hard I tried, I could not accept Davidson's assertion of Cope's affair with 'Miss Collins' in South Dakota or some of the other women mentioned, at least based on the evidence presented. Cope seems to have been, by accounts, quite unfaithful to his wife, but with whom he dallied and when probably cannot be ascertained without much more solid information.

Davidson's stated objective was "to present Edward Cope as a real human being," and that she has done. Cope comes across as an individual so taken with his self-orchestrated role in life and superiority to those around him that one imagines he would have been quite insufferable (p. 143: "To put it in a simplistic manner, he did precisely what he wanted to do at all times during his life. The only consideration he gave the opinions which others might have had of his actions involved how those opinions might be used to further his aims, or conversely, impede his intentions"). Davidson offers sometimes insightful, if purely speculative, explanations for his behavior, as further on page 143 she discusses how his excessive self-obsession might have been interpreted by Cope as his birthright for being incredibly bright. On the other hand, his behavior may reflect a bipolar personality bordering on the paranoid schizophrenic—entertaining all the while, but not a person to be on the wrong side of.

In his early years, Cope seems to have mastered the art of telling others what they wanted to hear while expressing his true feelings between-the-lines. This trait served him well as he grew up (first in dealing with his father and later with his wife, especially concerning his Quaker beliefs), but with financial and professional independence, his outspoken character emerged to public view. Clearly, he was obsessed with paleontology and natural science, and nothing would have stopped him from pursuing his studies, not his father, farming, rivals, his financial disasters, Indian wars, or finally, his failing health. In some individuals, this forcefulness might have been termed passion, but passion seems too tame a word for the forces that drove Cope. That he died because, in part, he medicated himself (with formalin and belladonna) for a condition (a chronic urogenital problem, not syphilis as often whispered) that might have been treatable by surgery shows the intense level of his inflated self-reliance.

Cope, of course, was the 'Master Naturalist' which formed the basis for a flattering biography long after Cope's death (Osborn 1931). Although written from an obviously admiring point-of-view, *Cope: Master Naturalist* is a fascinating book because it reproduces so many of Cope's direct words (although sometimes carefully edited, as Davidson notes), something we miss in Davidson's work to a large degree. Davidson prefers to let others judge Cope's scientific contributions, and even treads rather lightly on the Cope-Marsh feud. Cope was an extremely nasty character on the attack, and often played fast and loose with the facts. The hysteria and orchestration of the charges against Marsh (a complex and egocentric character in his own right) and John Wesley Powell accentuate a view of Cope as paranoid. Although Davidson does not reproduce or footnote the dramatic January 1890 *New York Herald* headlines attacking Marsh and the U.S. Geological Survey, they add considerable weight to an unflattering view of Cope and his agenda. One wonders after reading the actual correspondence and headlines how Cope could have been taken seriously. But then, such attacks had little to do with science by the time they got into the hands of know-nothing anti-science Congressmen from Alabama and the West (Stegner 1954). In this respect, Cope's legacy on Congressional support for scientific inquiry had long lasting and dramatically detrimental effects, quite the opposite of what he might have liked.

The last few chapters of Davidson's important biography deal with Cope's relationship with others, especially his wife, daughter, other women, and his views on society. Davidson reveals that Cope and his wife had a strained relationship, especially in the end when she left him (something overlooked in other Cope biographies I have read). He clearly loved his daughter, and strove for her to have a rigorous education, something unusual for his

time, while at the same time advocating an inferior role for women in society. Cope was a ladies man, and despite the pious letters reprinted by Osborn (1931), apparently had no qualms about breaking his conventional marriage bonds. His views on blacks were strong and racist, even for his time, and although he probably objected, his views were used by racists of his day in their drive to assert scientific support for rather outrageous assertions of the biological inferiority of Africans and those of other cultures. And speaking of outrageous, the various terms he coined to cloak his neo-Lamarkian views on evolution (e.g., bathmogenesis, ergogenesis, mnemogenesis; see Osborn 1931) would do a present day cladist proud. Davidson delves into each of these topics in great detail. Reading these chapters can throw a rather wet rag on Cope's shining personality to those of us who grew up with his image as "Master Naturalist." I enjoyed Davidson's debunking of the syphilis myth, but wonder why she didn't ask a specialist whether Cope died from the drugs or the unnamed urogenital condition. One more paragraph could have been enlightening.

Although I greatly enjoyed reading Davidson's account and comparing her version of events and interpretation with other accounts, the book is not without flaws. Some of the chapters would have been better with more information presented in the text instead of the Notes. The end of the book is abrupt. It is as if Chapter 8 ended, and the final two paragraphs were added as an after-thought to close it out. Surely, a more complete ending or summary could have been written. I certainly disagree with Davidson's portrayal of Cope's brushes with Powell and the Geological Survey as of minor importance. Quite the contrary, his attacks had long-lasting effects, very carefully discussed by Stegner (1954), a source curiously overlooked by Davidson. Powell (and rational science in the West) was not a casualty of standing too close to Marsh, but a direct target of Cope's vendetta. I was surprised at Davidson's fascination with a postcard from "a Professor K. Mitsukuri, who was evidently (sic) a biologist or even a paleontologist from Tokyo Imperial University..." In fact, Professor Mitsukuri was a well-known developmental biologist who published important papers on the early development of the eggs of turtles. It does not seem surprising that he would contact Cope concerning papers on the phylogeny of vertebrates. And finally, Davidson washes over more recent developments in the saga of Professor Cope, such as his wild west tour in 1892 and his designation as type specimen for *Homo sapiens* (see Psihoyos and Knoebber 1994). However, she points out the lack of credible evidence to Psihoyos and Knoebber's (1994) assertion that Cope's skeleton showed signs of syphilis.

Finally, the book suffers from the lack of an index and the great number of grammatical errors or omissions. It is very difficult to locate topics or information in the text and notes without an index. There simply is no excuse for the large number of textual errors, which detract considerably from its readability. My copy is filled with circles where I found missing words or phrases, or where the text just doesn't make sense. The book could have used some proper editing. If a book is sloppy in editing, is the scholarship equally sloppy? I certainly hope not, as this book long will be cited as an authoritative work on Professor Cope.

Ultimately, *The Bone Sharp* is not the definitive biography of Edward Drinker Cope. Its interpretations need to be read in conjunction with his own words (see Osborn 1931, for instance) and with other biographies and historical treatises (e.g., Stegner 1954; Plate 1964; references provided by Davidson). Only then can the real complexity of E. D. Cope, the man, be understood separately from the scientist. Cope made important and long lasting contributions to natural science, but the man himself was difficult, contradictory, and often arrogant. As Davidson states, "He was a man enviable for his wealth, charm, intelligence and good looks, but he was a man one could not always understand or respect." *The Bone Sharp* presents a remarkable insight into Cope's personality and, although I am sure it will be much debated among science scholars, it is an important contribution. I highly recommend it.

LITERATURE CITED

ADLER, K. 1989. Cope, Edward Drinker (1840–1897). *In* K. Adler (ed.), Contributions to the History of Herpetology, pp. 46–49. SSAR Contrib. Herpetol. No. 5, St. Louis, Missouri.

OSBORN, H. F. 1931. Cope: Master Naturalist. Princeton Univ. Press, Princeton, New Jersey. 740 pp.

PLATE, R. 1964. The Dinosaur Hunters. Othaniel C. Marsh and Edward D. Cope. David McKay Co., New York. 281 pp.

PSIHOYOS, L., AND J. KNOEBBER. 1994. Hunting Dinosaurs. Random House, New York. 267 pp.

STEGNER, W. 1954. Beyond the Hundredth Meridian. John Wesley Powell and the Opening of the West. Houghton-Mifflin, New York. (1992 Penguin edition, New York, 438 pp.).

The Fauna of India and Adjacent Countries Reptilia Volume I (Testudines and Crocodilia), by R. C. Sharma. 1998. Zoological Survey of India, Publications Division, 234/4, AJC Bose Road, 2nd MSO Building, 13th Floor, Nizam Palace, Calcutta 700 020, India. xiv + 196 pp. US$ 30.00; £ 20.00; Indian Rs. 500.00. ISBN 81-85874-6-9.

INDRANEIL DAS

Institute of Biodiversity and Environmental Conservation
Universiti Malaysia Sarawak
94300 Kota Samarahan, Sarawak, East Malaysia
e-mail: idas@mailhost.unimas.my

Thirteen years ago, the Zoological Survey of India (hereafter, ZSI) published, as part of its *Handbook* series, a work on the Indian Testudines, authored by Binoy Krishna Tikader (formerly Director, ZSI, now deceased) and Ramesh Chandra Sharma (formerly Officer-in-Charge, Desert Regional Station, ZSI at Jodhpur, now retired). The work of Tikader and Sharma (1985), at present out of print, contained serious errors of omission and commission. Now, the ZSI has thought fit to ask the second author to revise the *Fauna of (British) India* series on reptiles.

The introductory chapters of the first of the three volumes, covering Testudines and Crocodylia, are an indication of what is to come. It contains, in poor grammar, a general introduction, sections on progress in herpetology in India and "adjoining countries," phylogeny (which contains some vague remarks on "stem reptiles" as well as the origin of turtles, which the author firmly states "emerged from the early cotylosaurs"), distribution, and zoogeography (too long-winded for this reviewer), affinities of the reptiles of India, characteristics of Class Reptilia (generally agreed to be polyphyletic), leading to the definitions of the Order Testudines and accounts of each of the families that occur in the region.

Each species account comprises a suggested English name, the scientific name considered valid by the author, a synonymy (copied from Smith 1931, errors and all), a description written in an nonscientific style (e.g., "This is a gigantic, flat, soft-shelled species..."; p. 130), distribution (mostly from Smith 1931), habits and habitat, and conservation status. The last two categories contain most (unintentionally) amusing notes that more often than not hark back to Victorian times.

Although the author notes that knowledge on the fauna has increased substantially since the last treatment by Smith (1931), the present work omits many important papers and books published in the post-Independence period, including those on turtle and crocodile distribution and natural history. The fact that the author himself has published not a single paper on the subject is a pointer, and most of the references appear to have been derived from the earlier *Handbook*, which, in turn, were culled from Pritchard (1979) and Groombridge and Wright (1982), for the references from the last 30 years. Consequently, there are no references from the mid-1980s onwards.

Like Smith (1931), this work covers the entire mainland of southeastern Asia, besides the Indian Subcontinent, despite the fact that the author has no field experience outside of India. Much of the text has been copied, sometimes verbatim, from existing works, and when it is original, frequently introduces new errors. For instance, on p. 80, Sharma misinforms us of the distribution of *Melanochelys tricarinata*, indicating that it is found only in Bihar, Bengal, and Assam. Studies in the last 10 years have shown that the range of this species is about twice as large. Likewise, for perhaps India's rarest turtle, *Kachuga sylhetensis* (pp. 100–101), the distribution as known today is larger than "Garo, Khasi and Naga Hills." On the other hand, some species, such as *Aspideretes leithii* (pp. 137–138) have been stated to have larger ranges than recognized by reliable authorities. More seriously, several turtle species are shown as absent from India, including *Cuora amboinensis, Morenia petersi*, and *Pelochelys cantorii* (listed as *P. bibroni*; see Webb 1995 for the valid name of the taxon from the region), all known to occur in the country (see for instance, Das 1991; 1995). The common English names are not those suggested in Iverson (1992), but rather have been manufactured by the author, with disastrous results: Travancore vegetable-eating turtle for *Melanochelys trijuga coronata* (these turtles are omnivorous); Garo and Khasi Hills tortoise for *Cyclemys dentata* (Asian leaf turtle is more commonly used for this widespread turtle); and Assam freshwater tortoise for *Pyxidea mouhotii* (the keeled box turtle, which is terrestrial).

Readers are spared the poor quality color and black-and-white plates of preserved and misidentified species that characterized the *Handbook*, although most of the line art has been taken from that work. Of the new additions, some of the oddest depict crocodilians with scale markers in mm!

Taxonomic decisions are either poor or the author had no recent literature at hand on the nomenclature of the turtles of the world (see for instance, Iverson 1992). Thus, he refers all Indian testudinids to *Geochelone* (contra Crumly 1984; 1985) all trionychines to *Trionyx* (inspite of the convincing results from the phylogenetic analysis of Meylan 1987), and the batagurids to Emydidae (contrary to Hirayama 1984 and Gaffney and Meylan 1988). The subspecies concept of *Lissemys punctata*, as given in Smith (1931) is followed, despite the findings of Webb (1980; 1982) on the occupancy of names in these turtles, and the "Travancore tortoise" is noted as *travancorica* (rather than *forstenii*, as suggested by Hoogmoed and Crumly 1984). The important works of Moll (1986, 1987) on the taxonomy of the genus *Kachuga* are also ignored, as is new information on the biology and morphology of *Aspideretes nigricans*, reported by Ahsan and Haque (1991) and Ahsan and Saeed (1989). Indeed, the systematic and distributional information on Indian turtles are considerably more refined than during the time of M. A. Smith, thanks to the research of Bhupathy (1994, 1995), Bhupathy and Choudhury (1994, 1995), Frazier (1986, 1992), Frazier and Das (1994), Groombridge et al. (1983), Moll (1986, 1987), Moll et al. (1986), Moll and Vijaya (1986), Vijaya (1982, 1983), and many other workers, although this is not evident from this volume. For the Indian crocodiles, several Ph.D. theses have explored questions on ecology, although only the more popular articles are listed. The dangers of using the present work for formulating conservation plans are obvious.

The glossary provides some entertainment for those with time: "juxtaposed—placed in opposition to not imbricate"; "beak—the horny covering of the jaws assuming the shape of bird's beak"; "kinesis—fee movement between the bones or bony structure"; and finally, my favorite, "ossicle—a little bone." Many names of geographical localities are dated—Celebes, Foochow, Burma, Hainan, USSR—to give a few examples.

There are numerous false and misleading statements, including "the flesh [of *Amyda cartilaginea*] is not considered much suitable for human consumption" (p. 141), reference to *Aspideretes hurum* as endangered (p. 139), hatchling predation of *Crocodylus palustris* by herons and storks as a cause for their endangerment (p. 152), and so on. In general, the poor grammar and editing makes it difficult to distinguish typographical errors from other awkward phrases and expressions. An obvious one, of course, is Crocodylia, which has been misspelled Crocodilia even on the first page of the book. The spelling of this Order has clearly troubled the author, as the incorrect version appears not only at the start of the section on crocodilians (p. 141), but also as a running head throughout (p. 141 et seq.). Most annoying is the fact that several species names are consistently misspelled, according to the ICZN Code: *Hardella thurgi* for *Hardella thurjii* (p. 92), *Kachuga smithi* for *Kachuga smithii* (p. 95), and *Testudo horsfieldi* for *Testudo horsfieldii* (pp. 122–123). Interestingly, the titles on the dust jacket and spine are slightly different *(Fauna of India. Reptilia. Testudines and Crocodilians. Volume: I).*

In summary, this is neither a popular work nor a technical synopsis of the subject. It does not provide accurate information, nor is it aesthetically pleasing (no color photographs, an ancient font type, printing sometimes showing through on the opposite page, every scute of every turtle illustrated bears a name tag!). It has an incomplete bibliography, which would falsely suggest to the ininitiated that not much is known about the southern (and because of the coverage of this work, southeast) Asian turtle fauna. The Foreword by the Director, ZSI (p. iii) makes it abundantly clear that works like these will continue to be used for "formulating proper conservation strategies for ... protection," which confirms our worst fears.

The information presented has evidently been gleaned almost exclusively from three sources: Smith (1931), Pritchard (1979), and Groombridge and Wright (1983). Thus, if you have these works, you will save shelf space by not purchasing the latest work of Sharma. One now awaits with considerable trepidation the companion volumes on lizards and snakes in the *Fauna of India* series.

LITERATURE CITED

AHSAN, M. F., AND M. N. HAQUE. 1991. Observations on *Aspideretes nigricans*, a semi-domesticated endemic turtle from eastern Bangladesh. Amphibia-Reptilia 12:131–136.

_____, AND M. A. SAEED. 1989. The Bostami turtle, *Trionyx nigricans* Anderson: population status, distribution, historical background and length-weight relationship. J. Bombay Nat. Hist. Soc. 86:1–6.

BHUPATHY, S. 1994. The distribution of the Asian brown tortoise (*Manouria emys*) in India and the taxonomic status of subspecies. J. Bombay Nat. Hist. Soc. 91:147–149.

_____. 1995. Status and distribution of the river terrapin, *Batagur baska*, in the Sunderbans of India. Sacon News 2(1):5.

_____, AND B. C. CHOUDHURY. 1994. A note on the reproductive biology of the spotted pond turtle, *Geoclemys hamiltonii*. J. Bombay Nat. Hist. Soc. 91:146–147.

_____, AND _____. 1995. Status, distribution and conservation of the Travancore tortoise, *Indotestudo forstenii* in Western Ghats. J. Bombay Nat. Hist. Soc. 92:16–21.

_____, _____, C. S. SILORI, AND S. F. WESLEY SUNDERRAJ. 1994. Additional locality records for two Indian tortoise species. J. Bombay Nat. Hist. Soc. 91:149–150.

CRUMLY, C. R. 1984. A hypothesis for the relationship of land tortoise genera (family Testudinidae). Studia Geologica Salmanticensia. Vol. Especial I. Studia Palaeochelonologica 1:115–124.

_____. 1985. The Evolution of Land Tortoises (Family Testudinidae). Unpublished Ph.D. thesis, Rutgers University, The State University of New Jersey, Newark. 607 pp.

DAS, I. 1991. Colour Guide to the Turtles and Tortoises of the Indian Subcontinent. R and A Publishing Ltd., Portishead, United Kingdom. iv + 133 pp + 16 pl.

_____. 1995. Turtles and Tortoises of India. Oxford University Press, Bombay. x + 176 pp + 16 pl.

FRAZIER, J. G. 1986. Chelonians of north Bengal and Sikkim. J. Bengal Nat. Hist. Soc. n.s. 5:167–171.

_____. 1992. The land tortoises in Nepal: a review. J. Bombay Nat. Hist. Soc. 89:45–54.

_____, AND I. DAS. 1994. Some notable records of Testudines from the Indian and Burmese Subregions. Hamadryad 19:47–66.

GAFFNEY, E. S., AND P. MEYLAN. 1988. A phylogeny of turtles. *In* M. J. Benton (ed.), The Phylogeny and Classification of the Tetrapods. Vol. I. Amphibians, Reptiles and Birds. Systematics Association Special Volume 35A. pp. 157–219. Clarendon Press, Oxford.

GROOMBRIDGE, B., E. O. MOLL, AND J. VIJAYA. 1983. Rediscovery of a rare Indian turtle. Oryx 17:130–134.

_____, AND L. WRIGHT. 1982. The IUCN Amphibia-Reptilia Red Data Book. Part I. Testudines, Crocodylia, Rhynchocephalia. IUCN, Gland, Switzerland. 426 pp

HIRAYAMA, R. 1984. Cladistic analysis of batagurine turtles (Batagurinae: Emydidae: Testudinoidea): A preliminary result. Studia Geologica Salmanticensia. Vol. Especial 1. Studia Palaeocheloniologica 1:141–157.

HOOGMOED, M. S., AND C. R. CRUMLY. 1984. Land tortoise types in the Rijksmuseum van Natuurlijke Histoire with comments on nomenclature and systematics (Reptilia: Testudines: Testudinidae). Zool. Med. 58:241–259.

IVERSON, J. B. 1992. A Revised Checklist with Distribution Maps of the Turtles of the World. J. Iverson, Richmond, Indiana. 363 pp.

MEYLAN, P. A. 1987. The phylogenetic relationships of soft-shelled turtles (Family Trionychidae). Bull. Amer. Mus. Nat. Hist. 186:1–101.

MOLL, E. O. 1986. Survey of the freshwater turtles of India. Part I: The genus *Kachuga*. J. Bombay Nat. Hist. Soc. 83: 538–552.

_____. 1987. Survey of the freshwater turtles of India. Part II: The genus *Kachuga*. J. Bombay Nat. Hist. Soc. 84:7–25.

_____, B. GROOMBRIDGE, AND J. VIJAYA. 1986. Redescription of the cane turtle with notes on its natural history and classification. J. Bombay Nat. Hist. Soc. 83:112–126.

_____, AND J. VIJAYA. 1986. Distributional records for some Indian turtles. J. Bombay Nat. Hist. Soc. 83:57–62.

PRITCHARD, P. C. H. 1979. Encyclopedia of Turtles. T. F. H. Publications, Neptune, New Jersey. 895 pp.

SMITH, M. A. 1931. The Fauna of British India, including Ceylon and Burma. Vol. I. Loricata, Testudines. Taylor and Francis, London. 185 pp.

TIKADER, B. K., AND R. C. SHARMA. 1985. Handbook: Indian Testudines. Zoological Survey of India, Calcutta, India. 156 pp.

VIJAYA, J. 1982. Rediscovery of the forest cane turtle (*Heosemys silvatica*) in Kerala. Hamadryad 7(3):2–3.

_____. 1983. Freshwater turtle survey in India 1982–83. Hamadryad 8(1):21–22.

WEBB, R. G. 1980. The identity of *Testudo punctata* Lacépède, 1788 (Testudines, Trionychidae). Bull. Mus. Nat. Hist. Nat. Paris 4e 2:547–557.

_____. 1982. Taxonomic notes concerning the trionychid turtle *Lissemys punctata* (Lacépède, 1788). Amphibia-Reptilia 3:179–184.

_____. 1995. Redescription and neotype designation of *Pelochelys bibroni* from southern New Guinea (Testudines: Trionychidae). Chelonian Conserv. Biol. 1:301–310.

Ladies in the Laboratory? American and British Women in Science, 1800–1900, by Mary R. S. Creese. 1998. 452 pp, illustrated; cloth; ISBN 0-8108-3287-9. Scarecrow Press, Inc., US $98.00.

GEORGE R. PISANI

Biological Sciences, University of Kansas, Lawrence, Kansas 66045, USA
e-mail: gpisani@falcon.cc.ukans.edu

The publisher's announcement of this exceptionally thorough reference states that it is "a systematic survey and comparison of the work of 19th-century American and British women in scientific research"; it also remarks "this well-organized blend of individual life stories and quantitative information presents [a] broad and methodical coverage on a hitherto unprecedented scale." The publisher's hyperbole is quite accurate! Mary Creese has written over 20 articles on women scientists since 1990; this is her most ambitious undertaking. Her spouse Tom collaborated on some of her other works, and on this book. It includes a 58-page bibliography of the works published in journals by the scientists chronicled; these were gleaned from *Catalogue of Scientific Papers, 1800–1900* (The Royal Society, London).

The book outlines the work of 680 women scientists grouped in the major categories of Life Sciences (7 chapters), Math and Physical Sciences (5 chapters), and Social Sciences (4 chapters); the chapters represent topical subdivisions of these major categories. The number of women featured is especially noteworthy as the time period selected was one of intensely rigid views of the societal roles women were expected to play; science was not eminent among these. This statement is not at all intended to suggest that this situation materially improved over the succeeding 75 years, but most certainly those women profiled in this thorough work must be considered pioneers in the process of challenging role-barriers. Creese in fact remarks (pp. ix, xi) that "...by far the greater number [of these scientists] were active during the last two decades of the century, the time when the first of the university-trained women (in many respects a most remarkable group) were beginning their careers." Certainly this trend applies to those in herpetology.

The balance between dry, factual accounting and interesting reading in a work of this sort is difficult to maintain; indeed, the author acknowledges her goal to position the book between biobibliographies (more narrowly focussed on particular disciplines or persons) and broad historical surveys (which usually fail to pay sufficiently close attention to how the subjects came to enter particular fields, and what they accomplished). The resultant text contains pleasant diversions from its encyclopedic cataloguing to explore the personal lives, motivations, mentoring and personalities of many of the scientists listed.

Given the rigid views of the day, I found it interesting that several of the scientists profiled in the section "Museum Taxonomists to Morphologists and Embryologists" were afforded early recognition and assistance in their chosen fields by some eminent contemporary male scientists like Spencer F. Baird (USNM) and David Starr Jordan (University of Indiana). Bolstered by Jordan's encouragement and research support, Rosa Smith became the first woman to join the San Diego Society of Natural History, and in

1887 was appointed jointly (with H. F. Lorquin) Curator of Fishes and Reptiles at the California Academy of Sciences. Also in that section we find:

- Mary Bowers (Wellesley College), who conducted meticulous and extensive neuroanatomical studies of *Eurycea bislineata* (then *Spelerpes bislineatus*), and histological studies of *Bufo terrestris* (then *B. lentiginosus*).
- Anne Bowers and Inez Whipple Wilder (Smith College)—respiratory anatomy of *Desmognathus*.
- Gertrude Crotty (University of Kansas and Radcliffe College)—turtle embryology.
- Julia Platt (whose relatively brief but noteworthy career spanned several institutions—a story worth reading in itself!)—amphibian (especially *Necturus*) osteogenesis.
- Catherine Hopley (Gardens of the Zoological Society of London)—anatomical and popular works on snakes, reptiles in general, and amphibians, as well as a number of short entomological studies.
- Lilian Sheldon and Alice Johnson (Bathurst College)—amphibian embryology.

This is not a book one sits down and reads like a novel or biography. It is a reference work, and will be most useful (indeed indispensible) to persons interested in the history of science and women's studies. Additionally, it will be an essential reference for herpetologists offering courses and seminars concerning Women in Science. Though costly, the excellent workmanship evident in its production, its level of scholarship, and the numerous charts comparing the distributions of authors and papers within fields and between countries return a wealth of information for the expense.

PUBLICATIONS RECEIVED

Sounds of North American Frogs, the Biological Significance of Voice in Frogs [Compact Disc], by Charles M. Bogert. 1998. Smithsonian Folkways Recordings, 955 L'Enfant Plaza, SW, Suite 7300, MRC 953, Washington, D.C. 20560, USA. Compact Disc + 40 pp. accompanying booklet. US $14.00.

This is a reissue of Bogert's classic 1958 series of frog recordings. Fifty-seven taxa are represented in the 92 tracks, featuring anurans from across North America. In addition to updated track notes, the associated booklet contains the text of the essay "The Biological Significance of Voice in Frogs," written by Bogert at the time of the original release, as well as a new introduction by Richard G. Zweifel, and biographical sketch of the late Charles M. Bogert. Bogert himself narrated the tracks, which present a variety of advertisement calls, as well as other vocalizations. This reissue makes this pioneering work available on CD for the first time and will serve to remind herpetologists, especially those too young to remember the original release of the album, of the historical significance of Bogert's work in the field of animal sound study.

Monitoring Vertebrate Populations, by William L. Thompson, Gary C. White, and Charles Gowan. 1998. Academic Press, Inc., 525 B Street, Suite 1900, San Diego, California 92101-4495, USA. xv + 365 pp. Hardcover. US $64.95. ISBN 0-12-688960-0.

This book is designed as a guide for biologists and managers who require information about survey design for the purposes of estimating population size. As such it will prove valuable to those involved in monitoring amphibian and reptile populations, especially those under threat or presumed to be declining. The book deals with issues of plot design, sampling design, enumeration methods, distribution and density assessment, and trend detection. Separate chapters deal with specific examples relevant to each major vertebrate group, including amphibians and reptiles. A dichotomous key to enumeration methods provides guidance as to the type of techniques appropriate to differing sets of survey aims and population characteristic assumptions.

Herpetological Bibliography of Indonesia, by Indraneil Das. 1998. Krieger Publishing Company, Krieger Drive, Malabar, Florida 32950, USA. 92 pp. Hardcover. US $22.50. ISBN 1-57524-026-2.

This bibliography lists the citations for approximately 1700 publications dealing with the amphibians and reptiles of the Indo-Malayan Archipelago. The area covered includes most of Indonesia (excluding Irian Jaya and associated smaller islands), as well as the Andaman and Nicobar Islands (India and Myanmar), Sarwak and Sabah (Malaysia), and Palawan and the islands of the Sunda Shelf (Philippines). The references, which include citations in at least 14 languages, extend from the 18th Century to 1997. Systematic, faunal, and natural history publications make up the bulk of the citations, although papers on other topics are also included. Although extensive bibliographies are available for some groups of the herpetofauna in some regions of the Indo-Malayan Archipelago, this small book provides the first comprehensive set of citations. Of particular interest are many citations from southeast Asian journals not widely known to herpetologists outside the region.

Interpretive Atlas of Texas Lizards, by Ralph W. Axtell. 1986–1998, *et. seq*. Privately published by and available from the author (Ralph W. Axtell, 2814 Rock Hill Road, East Alton, Illinois 62024, USA). Individual accounts available separately. Cost: US $0.10/page + postage and handling.

The most recent installment (number 18) in this series is *Holbrookia maculata*, the lesser earless lizard. This account totals 11 pages in addition to a detailed range map representing over 350 localities and ca. 1150 specimens. Axtell provides an in-depth discussion of distribution in Texas, along with current taxonomy, geographic variation, conservation status, and suggestions for future work.

ERRATUM

A recent Natural History Note on the diet of *Lepidochelys kempi* (Frick and Mason 1998. Herpetol. Rev. 29[3]:166–168) contains two errors. First, the third entry in Table 1, an adult female (63.5 cm CCL), was actually stranded on 8 June 1993, not 8 July 1993. Second, this same turtle appears in an earlier note (Frick 1997. Herpetol. Rev. 28[3]:149). This specimen's inclusion in Table 1 of the more recent note should have included a citation of the earlier publication.

Information for Contributors

Herpetological Review is a peer-reviewed quarterly that publishes, in English, articles and notes of a semi-technical or non-technical nature, as well as book reviews, institutional features, commentaries, regional and international herpetological society news, research requests of SSAR members, and letters from readers directed to the field of herpetology. Articles reporting the results of experimental research, descriptions of new taxa, or taxonomic revisions are not published in ***HR***, but should be submitted to the ***Journal of Herpetology*** (see inside front cover for Editor's address).

Authors should submit an original and two copies of manuscripts. Manuscripts should be typewritten, double-spaced, on 21.5 x 28 cm (8.5 x 11 inch) white paper. Refer to this issue of ***HR*** for style and format information. Detailed information for submissions to Geographic Distribution, Natural History Notes, and Recent Population Changes appear in a recent issue of ***HR*** under their respective headings. **Corresponding authors should include an e-mail address (if available); this will greatly facilitate communication with the editors.**

Originals of illustrative material (e.g., tables, photographs, or diagrams) should be submitted with the text, with appropriate precautions taken to ensure delivery without damage. Illustrations should be discussed in the text and numbered sequentially with Arabic numbers. References to illustrations should be placed in parentheses at the end of sentences. Labeling within figures should be in 12 pt. sans serif font, such as Helvetica, Arial, or Geneva. Original photographs should be submitted as black and white glossy prints. For further guidelines, authors should consult *Scientific Style and Format: The CBE Manual for Authors, Editors, and Publishers* (6th edition, 1994, Council of Biology Editors, Inc., 11 South LaSalle Street, Suite 1400, Chicago, Illinois 60603, USA).

Submissions for Natural History Notes, Geographic Distribution, Herpetological Husbandry, Current Research, Regional Society News, and Legislation & Conservation should be sent directly to the appropriate section editor. Please send review copies of books to the Book Review Section Editor. Manuscripts intended for publication as Articles, Points of View, Techniques, or Recent Population Changes, as well as news notes and other material, should be sent to the Editor. Deadline for receipt of meeting announcements, news notes and related material is two months prior to each issue (e.g., 1 January for March issue).

The receipt of a manuscript by an editor will be promptly acknowledged. Although the advice and assistance of external reviewers will be sought for all manuscripts, the Editor has final responsibility for deciding whether a manuscript is suitable for publication. Notes submitted for publication in Geographic Distribution and Natural History Notes ordinarily will be reviewed by the Section Editors only. The editors reserve the right to edit a manuscript, but substantial alterations will not be made without permission of the primary author.

Reprints

Reprints of notes or articles published in ***HR*** should be ordered using the forms provided to authors as the issue goes to press. Proofs are not sent to authors of Geographic Distribution notes; these authors should indicate (at time of submission) whether reprints are desired and if so, the appropriate order forms will be sent prior to publication. These are also available upon request from the editor or managing editor.

Advertising

Herpetological Review accepts commercial advertising. Rates and copy information are available from the SSAR Treasurer (Dr. Robert D. Aldridge; contact information on inside front cover) or from the SSAR web page (http://falcon.cc.ukans.edu/~gpisani/HRinfo.html).

Herpetological Review (ISSN: 0018-084X) is published quarterly (March, June, September, and December) by the Society for the Study of Amphibians and Reptiles at Department of Biology, St. Louis University, St. Louis, Missouri 63103-2010, USA. Periodical postage rates are paid at St. Louis, Missouri with additional entry offices. **POSTMASTER:** Send address changes to *Herpetological Review*, Department of Biology, St. Louis University, 3507 Laclede Avenue, St. Louis, Missouri 63103-2010, USA. Please notify Robert D. Aldridge, SSAR Treasurer (address and contact numbers on inside front cover) regarding missing or damaged issues, as well as for changes of address.

ISSN 0018-084X

The Official News-Journal of the Society for the Study of Amphibians and Reptiles

Herpetological Review

Volume 30, Number 1 March 1999