NATURAL HISTORY NOTES

Instructions for contributors to Natural History Notes appear in Volume 29, Number 1 (March 1998).

CAUDATA

AMBYSTOMA CALIFORNIENSE (California Tiger Salamander). **SURVEY TECHNIQUE.** *Ambystoma californiense* is generally fossorial during the nonbreeding season and little is known of its underground habits. A new technique for locating and observing these salamanders underground is described herein. During Fall 1995, pipeline construction was scheduled to cross known *A. californiense* habitat 10 km SW of Santa Maria, California, USA. In an attempt to "clear" the pipeline right-of-way prior to construction, a fiber optic scope was utilized to locate *A. californiense* underground. The scope was an Olympus IF11D4-30 with a 3 m probe that could be powered by a car battery or with a portable battery. With this scope I was able to locate and observe a number of juvenile *A. californiense* within California ground squirrel (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*) burrows. All salamanders were located at depths of 1.3–2.1 m (length of the probe, not depth under the surface). These depths documented only the first salamander observed in each burrow. Within one burrow, a ground squirrel was observed in a bed of dried grass and upon its retreat from the probe, three juvenile *A. californiense* were observed in the grass below and to the side of the ground squirrel's location. *Ambystoma californiense* observed were generally active (possibly due to the bright scope light) and were often located along the sides of the burrows.

The scope was effective, although somewhat limited, in locating *A. californiense*. It was able to negotiate the 90° turns of the rodent burrows; however, two or more sharp turns would cause it to jam in the burrows. The directional head was helpful in guiding the probe around turns, although many burrows were too complex or too deep for the 3 m probe. I was able to verify presence, but not absence, of *A. californiense* within a certain burrow system.

Upon identification of several burrows containing *A. californiense*, an attempt was made to entice them above ground for capture and possible relocation. These burrow systems were encircled with silt fencing, pitfall traps were installed inside the fence, and a water truck was brought in to apply water to the enclosed areas. The enclosures (20 m^2) were saturated twice a day for two days using a total of 18,925 L of water. One juvenile *A. californiense* was caught in a pit-fall trap the morning after the second day of watering. Even with this limited success, the experiment was discontinued due to the size of the habitat to be crossed and the water required to simulate rain.

I thank Tom Olson for reviewing this manuscript and for the loan of and training on the fiber optic scope.

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ANURA

BUFO BOREAS (Western Toad). **MORTALITY.** While conducting a study of the movements and habitat use of adult *Bufo boreas* in the Targhee National Forest in southeastern Idaho, USA, I observed the mortality of numerous recently metamorphosed toadlets resulting from trampling by domestic sheep. My study area was centered on a 15 ha temporary pond, located within a pine/spruce forest. This area was within a grazing allotment that was grazed by sheep for about a week as they were driven towards private land. The pond is an important breeding site for *B. boreas* but usually dries by late July or early August. Over 20 pairs of *B. boreas* bred there in 1993 and 1995, but the only successful reproduction was in 1995. Because of the prolonged drought in the area, 1995 may have been the first successful reproduction since about 1986. By late July 1995, a large number (1,000's) of newly metamorphosed toadlets had concentrated at the shallow west shore; by 1 August the pond had dried.

On 4 August 1995, 500–1000 sheep were herded to within 150 m of the dried pond. At 0700 h on 5 August, I arrived at the pond and discovered the sheep were being driven into the dried pond from the west shore, through the concentration of toadlets and towards the habitat frequented by adult toads. After an hour the sheep were driven out of the pond through the opposite shore. As a result, an extensive area of riparian vegetation was completely flattened, and the majority of the toadlets were dead or dying. Hundreds were trampled by the sheep and by the end of the day hundreds more had desiccated. I checked three telemetered adults toads that were located in another part of the pond that was trampled by sheep and found they had escaped injury, apparently by hiding under logs or in rodent burrows.

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BUFO PARACNEMIS (Sapo-boi). **DEATH FEIGNING.** In tropical anurans, death feigning or thanatosis (Edmunds 1974. Defense in Animals. Longman, New York, 357 pp.) is documented in hylids (Sazima 1974. J. Herpetol. 8:376–377; Duellman and Trueb 1986. Biology of Amphibians. McGraw-Hill, New York. 670 pp.; Azevedo-Ramos 1995. Rev. Bras. Biol. 55:45–47). In the genus *Bufo*, there is a brief report of such behavior in *B. ictericus* in southeastern Brazil (Haddad and Sazima 1992. *In* L. P. C. Morellato [ed.]. História Natural da Serra do Japi: Ecologia e Preservação de uma Área Florestal no Sudeste do Brasil, pp. 188–211. Editoria da Unicamp/FAPESP, Campinas). Herein we report death feigning in *B. paracnemis*, a large toad widely distributed in South America (Frost 1985. Amphibian Species of the World. Allen Press, Lawrence, Kansas. 732 pp.).

On 24 February 1997, we found seven *B. paracnemis* (61–106 mm SVL; 16–115 g) resting under a board in a deforested area near the Mucuri River, Municipality of Mucuri, State of Bahia, eastern Brazil. When handled, the two smaller specimens (61, 65 mm SVL; 16, 22.7 g) exhibited death feigning. The smallest specimen adopted a typical motionless posture, with its limbs close to the body and eyes closed (Fig. 1) for 15–20 min. This behavior was preceded by secondary defensive mechanisms, observed in all specimens, including attempted escape, inflation of lungs, and emptying of the bladder. Although the function of death feigning is not well understood, it has been related to the avoidance of dead prey by certain predators or to the minimization of prey injury when seized by a predator. (Sazima, *op. cit.*; Azevedo-Ramos, *op. cit.*). Voucher specimens are deposited in the Coleção

Zoológica da Universidade Federal do Espírito Santo (ZUFES 140349-354) and the Museu Nacional do Rio de Janeiro (MNRJ 18913).

FIG. 1. Juvenile *Bufo paracnemis* feigning death.

We thank Ivan Sazima and José Perezx Pombal, Jr. for reading this manuscript and for identification of the toad. CZ thanks the PICDT/CAPES (fellowships grant) and RLT the CNPq (grant 302657/87-8). We dedicate this note in memory of Adão José Cardoso for his contribution to the knowledge of Brazilian anurans.

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ELEUTHERODACTYLUS SCHWARTZI (NCN). **REPRODUCTION.** On 10 October 1996, we observed five nests of the terrestrial frog *Eleutherodactylus schwartzi* on Great Dog Island, British Virgin Islands, West Indies. To our knowledge, this is the first report of nests of this species, which is endemic to the British Virgin Islands.

The nests were within separate bromeliads located in a patch of ground bromeliads (*Hohenbergia antillana*) that were ca. 16 x 13 m. Based on locations of advertisement calls of males after dark, the distribution of *E. schwartzi* on the island was almost exclusively confined to this patch. Rain had fallen on the days before our initial visit, and the habitat was moist. All nests were within an area ca. 3 m in radius. Each globular egg mass was attached to the inner surface of a leaf near the center of the bromeliad and towards its base. The center was moist, but there was no standing water. One nest was within an arboreal bromeliad (*Tillandsia* sp.), whereas the remaining nests were within bromeliads on the ground. Four nests contained a single clutch, whereas one contained two clutches. The eggs in three clutches were white and firm and were presumably newly-laid, whereas the others were discolored and larger. Movement and the presence of eyespots in the embryos within these larger eggs indicated that they were further along in development.

A male frog was in attendance at each nest and was either hunched over the eggs, or near the center of the bromeliad facing the eggs. In one case, a male appeared from the center of the bromeliad and approached the eggs when we held back the leaf for photography. One male (in Nest 2 below) was attending two egg masses located within a few centimeters from each other. We observed this frog switching positions from covering one egg mass to the other. Male parental care has not previously been reported for *E. schwartzi*.

The details of the nests recorded on 10 October were as follows: *Nest 1*: 12 eggs, white; egg diam 4.6–4.9 mm; located at a height of 180 cm within *Tillandsia* sp. in a tree. This nest together with the attending male, was transported to the laboratory on Guana Island. All eggs, which were kept at 26–28°C became infested with mold with the exception of one egg that hatched on 21 October. Both the hatchling and the male were deposited in the collection at the Museum of Comparative Zoology, Cambridge, Massachusetts (MCZ 125947–948). *Nest 2*: Egg mass 1 with 13 eggs, white; egg diam 4.4–4.9 mm; Egg mass 2 with 5 eggs, discolored; movement within eggs; egg diam 5.5–8.0 mm; located 40 cm from ground within *H. antillana*. *Nest 3*: 5 eggs, discolored; movement within eggs; egg diam 5.4–6.1 mm; located 36 cm from ground within *H. antillana*. *Nest 4*: 10 eggs, white; egg diam 5.0–5.5 mm; located 30 cm from ground within *H. antillana*. *Nest 5*: 10 eggs, discolored; movement within eggs; egg diam 8.4–8.8 mm; located 25 cm from ground within *H. antillana*.

FIG. 1. Male *Eleutherodactylus schwartzi* attending two egg masses within a bromeliad.

By 16 October, all the older egg masses in Nests 2, 3, and 5 had disappeared and presumably had hatched. In Nest 4, a frog was hunched over the eggs, which had been reduced from 10 to 6. The eggs were now discolored and appeared close to hatching. Five of the 13 eggs on the newer egg mass in Nest 2 were desiccated on the leaf. There was no trace of the other eggs or the older egg mass. An adult frog was at the base of the leaf. Folding back the leaf during our initial visit could have changed the microclimate and resulted in the eggs drying. Very little rain had fallen in the days preceding our second visit. Gad Perry and Kate LeVetring provided valuable assistance in locating the frogs and nests.

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PHYSALAEMUS NATTERERI (NCN). **PREDATION.** On 20 August 1996 a crab-eating fox (*Cerdocyon thous*) was collected on the highway between Caldas Novas and Ipameri (17°42'S, 48°32'W), State of Goiás, Brazil. Stomach analysis revealed *Physalaemus nattereri*, a small, nocturnal leptodactylid known for its defensive deimatic strategy of suddenly exposing the large ocelli on its back (Sazima and Caramaschi 1986. Rev. Biol. [Lisb.] 13:91–101) and for its ability to secrete holocrine substances from its inguinal glands (Vizotto 1964. Ci. e Cult. 16:168–169).

The present record obtained from a wild predator confirms the observations of Sazima (1973. Ci. e Cult. 25[supl.]:390), who observed predation of *P. nattereri* by captive representatives of all terrestrial vertebrates classes, except the burrowing owl (*Athene cunicularia*), suggesting that the deimatic behavior shown by *P. nattereri* of raising the posterior part of the body and hiding the anterior and ventral parts has a more defensive than inhibitory effect on a potential predator.

The partially digested specimen of *P. nattereri* was identified by José Perez Pombal Jr., and is deposited in the mammal collection of Museu Nacional (Universidade do Rio de Janeiro) as the stomach content of MN 37658.

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TESTUDINES

CLEMMYS MARMORATA PALLIDA (Southwestern Pond Turtle). **COPROPHAGY.** Ernst et al. (1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington, D.C., 578 pp.) reported intra- and interspecific coprophagy in North American tortoises (*Gopherus* spp.). In addition, red-eared sliders (*Trachemys scripta elegans*) are known to eat pig feces (D. Holland, pers. comm.). Western pond turtles (*Clemmys marmorata*) feed on a wide range of prey items (primarily aquatic invertebrates) and scavenge extensively (Bury 1986. J. Herpetol. 20:515–521). Here we present the first report of coprophagy in the southwestern pond turtle (*Clemmys marmorata pallida*).

On 3 July 1996 (1135 h), the first author observed a juvenile *C. m. pallida* (63.9 mm CL, 43 g) feeding on a coyote (*Canis latrans*) scat in a stream in the Chino Hills State Park, San Bernardino County, California, USA. The scat (6.0 g) was analyzed and found to contain mammal bones and hair, arthropod parts, plant material and seeds, and unknown waste matter. It is unclear what nutritional benefit the turtle obtained from eating the feces.

We thank Stephen H. Bryant, Curtis Clark, W. David Edmonds, and Dan C. Holland, for their comments and help with identification of arthropod and plant components.

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CLEMMYS MUHLENBERGII (Bog Turtle). **PARASITES.** Although leeches of the genus *Placobdella* parasitize many species of freshwater turtles, there are no published records involving *Clemmys muhlenbergii* (Moser 1995. Texas J. Sci. 47:71–74; Watermolen 1996. J. Fresh. Ecol. 11:211–217). Such data are needed since leeches are known vectors of turtle endoparasites such as trypanosomes (Woo 1969. Can. J. Zool. 47:1139–1151) and haemogregarines (Siddall and Desser 1992. Can. J. Zool. 70:123–128).

Between 10 June and 5 September 1996, 23 bog turtles were captured 107 times from four spring-fed, wet meadows in Floyd County, Virginia, USA, and examined for leeches. Upon initial capture, 7 male and 5 female turtles (mean ± SD; [range]: CL = 92.64 ± 3.71 mm [87.4–99.07 mm]; mass = 121.08 ± 14.16 g [98–145 g]) were parasitized by a total of 20 leeches. Leech prevalence was 52.2% and mean intensity was 1.67 ± 1.53 (range = 1–8). The parasites were distributed on the turtles as follows: carapace = 60%; plastron = 20%; posterior limbs = 15%; tail = 5%. Because all leeches were removed from each turtle, it was possible to document recolonization. An adult female *C. muhlenbergii* captured on 1, 11, 15 July, and 17 August, 1996 was parasitized by 8, 5, 1, and 2 leeches, respectively. A male captured on 10 June, 15 and 18 July, and 1 August, 1996 had 1, 3, 3, and 1 leeches. Another male captured on 19 June and 16 July, 1996 had a single leech on both occasions. When identification was possible (23 of 36 cases), leeches were identified as *Placobdella multilineata*. Thirty-three leeches were deposited into the Royal Ontario Museum's invertebrate collection (ROM IZI 4363).

Because *P. multilineata* is known to parasitize several species of turtles (Forrester and Sawyer 1974. J. Parasitol. 60:673; Sawyer and Shelley 1976. J. Nat. Hist. 10:65–97) that are known hosts of haemogregarines (Wang and Hopkins 1965. J. Parasitol. 51:682–683; Patterson and Desser 1976. J. Protozool. 23:294-301; McAuliffe 1977. J. Parasitol. 63:580–581), and because *P. multilineata* is a known vector of alligator haemogregarines (Khan et al. 1980. J. Parasitol. 66:324–328), future research should investigate blood parasites in *C. muhlenbergii*.

We thank Melody A. Kirkendall and C. Shay Garriock for assistance in the field, Don Stacey of the Invertebrate Zoology Department of the Royal Ontario Museum for confirming leech identifications, and Carola A. Haas and Joseph C. Mitchell for support and guidance. This research was supported by the U.S. Fish and Wildlife Service, Virginia Department of Game and Inland Fisheries, and the Wildlife Conservation Society.

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LACERTILIA

CNEMIDOPHORUS (Whiptail Lizards). **DIET.** During 1993 field work in the Mexican state of Morelos, we collected representatives of three species of *Cnemidophorus*. Although species of *Cnemidophorus* are known to feed primarily on small insects, they occasionally prey on other reptiles. Nothing is known, however, about the sizes and kinds of reptiles consumed.

A female *C. deppei infernalis* (SVL 80 mm, tail 167 mm, mass 12 g) was collected on 14 February 1993 at Las Piedras (18°40'N, 98°59'W), in the municipality of Ayala, Morelos, México, at 1020 m elevation, in dry, tropical forest habitat. Its stomach contained a small snake, *Leptotyphlops maximus* (SVL 116 mm, mass 0.51 g).

On 13 June 1993 we collected a male *Cnemidophorus sacki gigas* (SVL 129 mm, tail 163 mm, mass 65.0 g) at El Caracol

(18°53'N, 99°00'W), in the municipality of Yautepec (1031 m elevation) in tropical dry forest. Its stomach contained six eggs of a conspecific, possibly a full clutch (mean egg mass 0.35 g ± 0.23 (0.05–0.61 g, mean length 14.5 ± 0.56 mm (14.0–15.4 mm), mean width 11.2 ± 0.7 mm (10.0–11.7 mm).

Finally, an adult male *Cnemidophorus costatus costatus* (SVL 97.0 mm, mass 27.5 g) was collected on 30 July 1993 in the same area of El Caracol. Its stomach contained the remains of a snake, *Masticophis mentovarius* (SVL 140 mm, mass 1.38 g).

These data suggest that *Cnemidophorus* in this area not only eat small invertebrates, but also reptiles and the eggs of lizards. Lizards of the genus *Cnemidophorus* are known to be an active foragers, spending considerable time searching for prey on the ground. These new data confirm their foraging habits, as the prey eaten were found in leaf litter, and the *Cnemidophorus* eggs consumed are known to be deposited on the ground among dry foliage.

We thank L. A. Fitzgerald for his comments on this manuscript, and R. J. Torres for his help in the field.

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CTENOSAURA PECTINATA (Brown Iguana) **DIET**. Reports from different locations throughout its range indicate that *C. pectinata* predominantly feeds on leaves, fruits, and insects, and to a lesser extent on nestling birds and mice (Evans 1951. Amer. Mus. Novit. 1493:1–26; Fitch et al. 1971. Southwest. Nat. 15:397–399; Alvarez del Toro 1972. Los Reptiles de Chiapas. Gob. del Edo. de Chiapas. México). Its diet on Isla Isabel, México (a 98.3 ha island 28 km off the coast of Nayarit, 21°52'N, 105°54'W), is known only from unpublished anecdotal records, and includes the new leaves and fruits of "ruache" trees (*Crataeva tapia*) during the rainy season, sooty tern (*Sterna fuscata*) and brown pelican (*Pelecanus occidentalis*) nestlings, and one report of a 3 cm^3 piece of fish. Herein we report the stomach contents of 10 *C. pectinata* captured on this island.

Lizards were captured by noosing in March 1992, during the dry season, when ruache trees do not produce leaves or fruits. The only new leaves available are those of herbaceous plants thriving on dew that accumulates overnight. At this time of year, five of the nine seabird species inhabiting the island were breeding. Six lizards were captured between 0900 and 1300 h in the northeastern part of the island, in a ruache forest that is also a major nesting site of blue-footed boobies (*Sula nebouxii*). Four additional lizards were captured in adjacent grassland.

Lizards were measured (SVL) and weighed. Eight males measured 29–36 cm SVL (33 ± 1.9 cm) and weighed 750–1650 g (1248 ± 254 g); two females measured 19–23.4 cm (21.2 ± 2.2 cm) and weighed 27–34 g (34.1 ± 3.7 g). Stomach contents were flushed out with water, and preserved in 70% ethanol. Stomachs of nine of the ten lizards contained food items. Five males and both females had *Portulaca oleracea* leaves in their stomachs. The stomachs of two other males contained animal tissue and bone fragments that were probably the remains of nestling birds, based on their size and porosity. These data and those coming from unpublished observations suggest that *C. pectinata* living in the northern part of Isla Isabel are food generalists, and opportunistically feed on nestling seabirds.

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EUMECES LATICEPS (Broadhead Skink). **NATURAL NESTS**. Observations on natural nests in *Eumeces laticeps* suggest that eggs are laid from late June through July, that clutch size is 6–20, and that eggs are 13.0–19.8 mm long and 9.0–14.8 mm wide (Martof 1956. Herpetologica 12:111–114; Mount 1975. The Reptiles and Amphibians of Alabama. Alabama Agri. Exp. Sta. Auburn, Alabama. 347 pp.; Palmer and Braswell 1995. Reptiles of North Carolina. Univ. North Carolina Press, Chapel Hill. 412 pp.; Smith 1946. Handbook of Lizards. Cornell Univ. Press, Ithaca, New York. 557 pp.). Martof (*op. cit.*), however, mentioned one nest found in mid-September from the Blue Ridge of Georgia. Here we add to this observation by presenting information on two other clutches from Georgia.

On 2 July 1997 two *E. laticeps* were found in Seminole County, Georgia, USA, brooding 15 and 16 eggs, respectively. Both specimens were situated in oval cavities beneath a single sheet of roofing tin that was on the ground. The nests were less than one meter apart, and appeared very similar to a nest described by Martof (*op. cit.*) from Thomas County, Georgia. During discovery of the first nest, a nearby colony of imported fire ants (*Solenopsis invicta*) was disturbed. Several ants reached the nearest *Eumeces* nesting chamber and were quickly consumed by the attending female. No ants were observed to reach the second nest.

Both clutches and the attending females were collected. Eggs from both clutches appeared to be of similar size and shape, and no damage to any of the eggs was noted. Several days later, it was discovered that one of the eggs from the clutch of 15 was ruptured, and most of the contents lost. Closer examination of the container housing this clutch revealed a single large worker fire ant, although it is not known if the egg was damaged by this ant, or during transit.

Mean length for the 14 remaining eggs in this clutch was 18.06 ± 0.53 mm (range 17.40–19.13 mm); width 13.49 ±0.43 mm (range 12.75–14.10 mm); and mass 1.84 ± 0.14 g , (range 1.6–2.0 g). The attending female (SOCM 0287) measured 115.0 mm SVL, 238.8 mm TL, and 26.2 g mass. Mean egg length in the second clutch was 18.30 ± 0.87 mm (range 16.78–19.87 mm); width 12.93 ± 0.49 mm (range 12.20–13.95 mm); mass was 1.68 ± 0.20 g (range 1.3–2.0 g). The attending female of this clutch (SOCM 0288) measured 111.7 mm, 271.7 mm TL, and weighed 26.9 g.

The size of eggs in these two clutches corresponds with the upper end of known ranges for natural nests. Smith (*op. cit.*) indicated that eggs of this species increase in size as they near hatching. Thus it is possible that both clutches discussed above were near hatching.

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PHRYNOSOMA PLATYRHINOS (Desert Horned Lizard). **PREDATION**. Known predators of horned lizards (genus *Phrynosoma)* were recently summarized (Duncan et al. 1994. Herpetol. Rev. 25:68) but no invertebrates were included. We observed apparent predatory behavior on *P. platyrhinos* by a scorpion during a nocturnal survey of the East Pinta Sands, Cabeza Prieta National Wildlife Refuge, Arizona, USA. The area is a sparsely-vegetated sand sheet within the Lower Colorado River Valley Subdivision, Sonoran Desertscrub community (Turner and Brown 1982. *In* D. E. Brown, ed., Biotic Communities of the American Southwest—United States and Mexico, pp. 181–221. Desert Plants 4). At 2120 h on 6 May 1997, we discovered an adult *Hadrurus arizonensis* (Arizona giant hairy scorpion) carrying on its back a juvenile *P. platyrhinos* in an upside-down position (Fig. 1). The scorpion had a firm grasp with its chelicerae on the lizard's dorsal skin at the base of the tail. The lizard's left rear leg was held in the scorpion's left pedipalp, and the right rear leg was supported by its right pedipalp, so that the lizard's head rested on the base of the scorpion's tail. The lizard was still alive, and managed to break free after we had been observing the pair for ca. 30 min. We held the lizard overnight and released it, apparently unharmed, the following morning. The scorpion had a body (carapace + mesosoma) length of 44 mm, tail (metasome + telson, excluding recurved portion of telson) 51 mm, and mass 8.3 g. Lizard SVL was 52 mm, tail 26 mm, mass 6.4 g.

Although horned lizards commonly spend summer nights burrowed into the ground (Heath 1965. Univ. California Publ. Zool. 64:97–136), nocturnal activity by *P. platyrhinos* has been described (Pianka and Parker 1975. Copeia 1975:141–162). This potentially puts it into contact with *H. arizonensis*, which is most active in the first hour after sunset (Fox 1975. Unpubl. Ph.D. dissertation, Arizona State Univ., Tempe). Laboratory tests found that while stinging was a common behavior in capturing large prey, *H. arizonensis* venom had no lethal or immobilizing effect on several lizard and mouse species. Envenomation, however, was not necessary for successful ingestion of vertebrate prey so long as the scorpion could immobilize its prey with its pedipalps (Hadley and Williams 1968. Ecology 49:726–734). *Hadrurus arizonensis* has been found in densities up to 0.5/m^2 in the Colorado Desert (Williams 1980. Occ. Pap. California Acad. Sci. 135:1–127), and thus may be a significant predator on horned lizards in shared habitat.

We thank George Bradley for assistance with scorpion description and literature.

FIG. 1. Juvenile *Phrynosoma platyrhinos* captured by an adult *Hadrurus arizonensis*.

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PTYODACTYLUS OUDRII (NCN). **PARENTAL CARE.** Parental care through egg-attendance is a common behavior in some vertebrates but is relatively rare in reptiles. Reported examples in reptiles are indeed very primitive and include a) the active manipulation of eggs soon after oviposition to locate them at favorable places, b) parents remaining in the vicinity of the eggs after oviposition, returning to them regularly, c) a more complex behavior where the parent(s) remain coiled around the eggs to facilitate embryonic development by thermogenesis, d) active defense of clutches against potential predators and finally, more rarely, e) the care of newly hatched juveniles (cf. Shine 1988. *In:* C. Gans and R. B. Huey, eds., Biology of the Reptilia. Defense and Life History. Vol. 16, Ecology B. A. R. Liss Inc. New York, pp. 275–329). All these behaviors are likely to increase the survival of offspring.

The manipulation of eggs after oviposition is rare in Squamata and so far, has never been reported in geckos. The only reported exception refers to the relocation of eggs soon after oviposition in the Moorish gecko, *Tarentola mauritanica*, to settle them at suitable places (Nettman and Rykena 1979. Salamandra 15:53–57). Here, we describe a noteworthy example of parental care by manipulation, body rubbing of the eggs, and egg licking in *Ptyodactylus oudrii*. To our knowledge, this is the first time that this complex type of parental care has been reported in reptiles.

Ptyodactylus oudrii is an insectivorous, small sized (adult SVL 50 mm, mass 3.4–7 g) gecko found in mountain areas of Tunisia, Algeria, and Morocco (Heimes 1987. Salamandra 23:212–235; Le Berre 1989. Fauna du Sahara I. Poisson-Amphibies Reptiles. Lechevalier-R. Chabaud, Paris, 352 pp.) in very harsh, arid zones throughout its distribution. The species lives in small colonies (mean = 10 individuals, range 4–20) on the vertical and overhead walls of caves and culverts under roads (García-Márquez et al. 1996. Bol. Asoc. Herpetol. Esp. 7:28–30). The presence of a morphological adaptation in their limbs (a "plumage" structure instead of claws) allows them to walk on these surfaces. As in other species of *Ptyodactylus*, this gecko performs communal oviposition, fixing the clutches directly onto the overhead or lateral walls of the caves. Clutch size is often two, with calcified, spherical, white eggs, 12–14 mm diameter. In captivity, *P. oudrii* completes its reproductive cycle in 40 days, laying multiple clutches per year (unpubl. data).

A total of 31 *P. oudrii* (15 males and 16 females) were captured near Ouarzazate (30°55'N, 6°51'W, S Morocco) in May 1990 and transported by car to Sevilla (southern Spain) for detailed observations of parental care. The geckos were kept in communal cages (3 x 3 x 1 m) under lab conditions, at ambient temperatures (28–31°C) with a 12:12 h light regime. The walls of the cages consisted of a mesh grid (0.3 cm width) with a cover allowing the geckos to walk on overhanging surfaces. A glass terrarium was also used for detailed observations. Both the cage and the terrarium were provided with a 10 cm sand substrate and were watered regularly to increase ambient humidity. Food (crickets, cockroaches, and mealworms) and water were provided *ad libitum*. The geckos completed several reproductive cycles in captivity, showing no apparent stress.

A unique nesting site was observed in each cage. The clutches hung from the ceilings of each cage, or, less often, on the vertical walls of the terraria, typical behavior observed in free-ranging

geckos (see García-Márquez et al. in press *op. cit.*). Clutch size was consistently two with different clutches easily distinguishable. The remains of previous nesting attempts (e.g., shells, carcasses) were also observed at each nesting place. Parental care observed included egg cleaning by continuous body rubbing and egg-licking with the tongue. Geckos moved freely within the clutches. All geckos available in the colony (both sexes, all age-classes) performed active manipulation of eggs during incubation, returning regularly. Each individual attended not only to its own clutch, but to others, an example of communal parental care. Eggs were not moved from their original oviposition location. Often, several geckos remained in the vicinity of a clutch after oviposition, returning to it regularly, thus keeping the nesting site attended by at least one individual at all times.

The manipulation of eggs by *P. oudrii* may represent an active defense against pathogens or fungal attacks (e.g., Forester 1979. Copeia 1979:332–341; Shine 1988, *op. cit.*). Other potential sources of mortality such as predation or egg desiccation might also be reduced. According to Noble and Mason (1933 in Shine 1988, *op. cit.*), parental care in reptiles may have evolved more rapidly in non-burrowing species where appropriate limbs to excavate a nest are lacking. Also, parental care is more likely to occur in harsh, highly variable environments (Huntingford 1984. The Study of Animal Behaviour. Chapman and Hall, 411 pp. Cornwall). Presumably, both factors may have played an important role in the evolution of this behavior in *P. oudrii*.

Animals were collected under a license from the Kingdom of Morocco (77-c/57-51-0).We thank Arturo González for raising the geckos in captivity. Comments provided by Claudia Keller and Carmen Díaz Paniagua improved this note. The work was financed by a DIGICYT project (PB# 94-0008) and a travel grant from Junta de Andalucía (group 4088).

Submitted by **JOSÉ ANTONIO MATEO** and **MARIANO CUADRADO**, Estación Biológica Doñana, Pabellón del Perú, Avda. de María Luisa, Apartado de Correos 1056, Sevilla E-41080, Spain.

SCELOPORUS UNDULATUS ELONGATUS (Northern Plateau Lizard). **MATING BEHAVIOR**. On 7 June 1997 at 0915 h, I encountered a male and female *Sceloporus undulatus elongatus* on a small rock outcrop at the confluence of Currant Creek and Flaming Gorge Reservoir, Sweetwater County, Wyoming, USA. The male was positioned diagonally across the back of the female so that his cloaca was to the right of hers. He was biting her neck just behind the left side of her head. The female attempted to remove the male from her back by lifting her hindlegs, one at a time, and scratching the male, while also moving around in a circle. The female then rolled onto her back, squirmed, and dislodged the male. Next, she stood parallel to the male and arched her back. Meanwhile, the male had righted himself. The female turned and faced the male while still in the arched posture, then charged him. The male retreated about 1 m up the rock outcrop. At this point, I captured both lizards (male: 57 mm SVL; 78 mm tail length; 5 g; female: 73 mm SVL; 86 mm tail; 14 g).

The behavior of the female could be interpreted in one of two ways. She may have been startled by me, thus triggering an escape attempt. Alternatively, this may have been rejection behavior in response to attempted copulation.

I thank Kristi L. Ashton and Alan de Queiroz for comments and suggestions on the manuscript.

Submitted by **KYLE G. ASHTON**, Department of EPO Biology, Campus Box 334, University of Colorado, Boulder, Colorado 80309, USA.

SERPENTES

CHAMAELYCUS FASCIATUS (NCN). **DIET.** Few data are available on the feeding habits of *Chamaelycus fasciatus*, a small African colubrid snake reaching 350 mm total length (Doucet 1963. Les Serpents de la Côte d'Ivoire. Acta Tropica 20(3):201–340). Doucet (*op.cit.*:245) and Villiers (1975: 108. Les serpents de l'ouest africain. Intitiations et études africaines. No. II. 3ème édition, Université de Dakar, Institut Fondamental d'Afrique Noire. Les Nouvelles Editions Africaines, 195 pp.) reported it feeding on beetles and reptile eggs. An adult male (SVL 272 mm, tail 48 mm), collected in Congo, area of Loango, cataloged in the Paris Natural History Museum (MNHN 1973.1249) had a gerrhosaurid lizard, *Gerrhosaurus nigrolineatus* (SVL 62 mm, tail 135 mm), in its stomach (MNHN 1997.3339).

Submitted by **IVAN INEICH**, Museum National d'Histoire Naturelle, Laboratoire de Zoologie (Reptiles and Amphibiens), 25 rue Cuvier, F-75005 Paris, France; e-mail: Ineich@cimrs1.mnhn.fr.

CONOPHIS VITTATUS VITTATUS (Road Guarder, Guardo Camino). **CLUTCH SIZE.** On 17 March 1994 we collected a gravid *Conophis vittatus vittatus* from tropical dry forest at the Biological Field Station Chamela, Jalisco, México (19°30'N, 105°03'W). The snake was kept in captivity for two months after capture, with oviposition occurring on 21 May. The snake measured 620 mm SVL, tail 140 mm, mass 87.8 g before oviposition, and weighed 64.1 g after oviposition. Clutch size was 12 eggs and mean egg mass was 2.07 g (3.25–0.70 g). Mean egg length and width were 23.9 mm (18.5–29.5 mm) x 12.2 mm (9.5–14.3 mm); relative clutch mass (RCM) was 0.28 g. The RCM value is comparable to those for snakes of similar size (Seigel et al. 1986. Herpetologica 42:179–185; Ramírez-Bautista et al. 1995. Herpetol. Rev. 26:12–13).

We thank S. Monk for comments on the manuscript.

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

BOTHROPS FONSECAI (Fonseca's Lancehead). **REPRODUCTION and SIZE.** Among the heavy-bodied pitvipers of the *Bothrops alternatus* group, *B. fonsecai* is the least known. This snake is found in montane areas of southeastern Brazil with mixed broadleaf and *Araucaria* pine forest (Campbell and Lamar 1989. The Venomous Reptiles of Latin America. Cornell Univ. Press, Ithaca, New York, 425 pp.). Here we provide data on reproduction and size for this species from two localities in São Paulo State.

A large (967 mm SVL, 112 mm tail length [TL]) female *B. fonsecai* was found DOR on 22 January 1993 in the Serra do Mar at Cunha (23°10'S, 44°55'W, 1120 m elevation), and deposited in the reptile collection of the Museu de História Natural, Universidade Estadual de Campinas (ZUEC 1562). The oviducts contained 14 fully-developed embryos, one of which was dam-

aged and not measured (SVL mean ± SD [range] in mm = 217.7 ± 5.9 [205–229]; TL = 36 ± 3.5 [27–42]).

The only reported measurements for *B. fonsecai* are that of the male holotype (Hoge and Belluomini 1959. Mem. Inst. Butantan 28:195–206). We measured 12 adult males that were collected in the Serra da Mantiqueira at Campos do Jordão (22°44'S, 45°35'W, 1540–1600 m elevation) and deposited at ZUEC (SVL = 661.6 ± 72 [550–755 mm]; TL = 104.1 ± 11.9 [80–120] mm). One female collected at this site measured 810 mm SVL and 100 mm TL. The related *Bothrops cotiara* averages 700–800 mm in total length and may reach 1000 mm (Campbell and Lamar, *op. cit.*).

We thank H. K. M. Corrêa and P. E. G. Coutinho for collecting the Cunha snake; O. Augusto, S. A. Chini, and C. R. C. Souza for help with fieldwork at Campos do Jordão; the Instituto Florestal (through M. J. Robim and J. L. Carvalho) for logistical support at Campos do Jordão and Cunha sites; and the CNPq for financial support.

Submitted by **IVAN SAZIMA** and **PAULO ROBERTO MANZANI**, Departamento de Zoologia and Museu de História Natural, Universidade Estadual de Campinas, 13083-970 Campinas, São Paulo, Brazil.

ERYTHROLAMPRUS BIZONA (False Coral Snake). **DIET**. In the garden of a hotel in Curimagua, Estado Falcón, Venezuela, ca. 1150 m elevation, we found a false coral snake, *Erythrolamprus bizona* (CIEZAH 387), which subsequently regurgitated an adult *Ninia atrata* (CIEZAH 388). The *Ninia* was partially digested from the anal plate to the tail. Ophiophagy is well known in the genus *Erythrolamprus* but this is the first report of identified prey in Venezuela (Roze. 1970. Ciencia y Fantasia de las Serpientes de Venezuela. Editorial Fondo de Cultura Científica, Caracas. 160 pp.; Lancini and Kornacker. 1989. Die schlangen von Venezuela. Verlag Armitano Editores. Caracas. 381 pp.). The two specimens are deposited in the Herpetological Collection of the Centro de Investigaciones en Ecología y Zonas Áridas (CIEZAH), Universidad Francisco de Miranda, Coro, Venezuela.

Submitted by **ABRAHAM MIJARES-URRUTIA** and **ALEXIS ARENDS R.**, Centro de Investigaciones en Ecología y Zonas Áridas (CIEZA), Universidad Francisco de Miranda, Apartado 7506, Coro 4101-A, Venezuela; e-mail (AM): amijares@reacciun.ve and (AA): aarends@funflc.org.ve.

CROTAPHOPELTIS HOTAMBOEIA (White Lipped Snake). **SNAKEBITE**. The venom of *Crotaphopeltis hotamboeia* is thought to be harmless to humans (Spawls and Branch 1995. The Dangerous Snakes of Africa. Ralph Curtis Books, Sanibel Island, Florida. 192 pp.) yet fatal to small mammals and fowl (Frei 1910. Ztschr. F. Infektionskr., par Krankh U hyg. D. Haoustiere 3:211–217; FitzSimons 1912. The Snakes of South Africa; Their Venom and the Treatment of Snake-bite. T. Maskew Miller, Cape Town, South Africa. 547 pp.). At the Serena Lodge in Amboseli National Park, Kenya, at ca. 0130 h on 2 November 1989, a 22 year-old female was bitten while trying to rescue a *C. hotamboeia* (ca. 60 cm SVL) from a domestic cat. The bite was on the right index finger, and although the wounds were small, bleeding was immediate, profuse, and lasted several minutes. By dawn a large, medial hematoma was present. The hematoma was darkest at the wrist and extended up the right arm almost to the elbow. The hematoma and profuse bleeding are characteristic of a venom possessing anticoagulatory, hemorrhagic, spreading, and possibly hemolytic factors. The hematoma disappeared over the next several days, with no further ramifications. The snake was released in Amboseli on the day following the incident.

We thank Michael C. Cheptumo, Curator of the Snake Park at the National Museum of Kenya, Nairobi, who verified the identification of the snake from a photograph.

Submitted by **PHYLLIS A. BREDEHOFT**, Division of Neonatology, Children's Mercy Hospital, 2401 Gillham Road, Kansas City, Missouri 64108, USA, and **DONALD D. SMITH**, Division of Allergy and Rheumatology, University of Kansas Medical Center, 3901 Rainbow Boulevard, Kansas City, Kansas 66160, USA.

DIADOPHIS PUNCTATUS (Ringneck Snake). **PREDATION**. In his monograph on the ringneck snake (*Diadophis punctatus*), Fitch (1975. A Demographic Study of the Ringneck Snake, *Diadophis punctatus*, in Kansas. Misc. Publ. 62, Univ. Kansas Mus. Nat. Hist. 53 pp.) recorded three avian predators: the red-tailed hawk (*Buteo jamaicensis*), broad-winged hawk (*B. platypterus*), and great horned owl (*Bubo virginianus*). Here, we add a non-raptor, the American robin (*Turdus migratorius*), to this list of avian predators.

On 15 August 1996, DLH saw an adult robin capture a ringneck snake (ca. 20 cm TL). The encounter was observed through 7 X 42 binoculars and took place on the front lawn of DLH's Cincinnati, Ohio (USA) home. After pecking at the snake numerous times, the bird coiled the apparently dead snake in its bill and flew into the crown of a nearby tree. Later in the afternoon, SEH located a robin nest in the tree. The nest held two fully-grown young who fledged the following day.

The American robin previously has been reported as a predator of *Storeria dekayi* (Netting 1969. Wilson Bull. 81:471), *Thamnophis sauritus* (Eiserer 1976. The American Robin. Nelson Hall, Chicago, Illinois. 175 pp.), and *T. sirtalis* (Davis 1969. Wilson Bull. 81:470–471).

Submitted by **DAVID L. HEDEEN**, Department of Entomology and Applied Ecology, University of Delaware, Newark, Delaware 19717, USA; and **STANLEY E. HEDEEN**, Department of Biology, Xavier University, Cincinnati, Ohio 45207, USA.

EUNECTES MURINUS (Green Anaconda) and ***PHRYNOPS GIBA*** (Gibba Turtle). **PREDATION.** On 7 January 1997, we observed a male *Eunectes murinus* constricting a *Phrynops giba* in the Bush Bush Wildlife Sanctuary, Trinidad, West Indies (Fig. 1). The anaconda had been there less than 24 h, as we had been to this location (10°02.273 N, 61°23.473 W; reading obtained from Trimble ScoutMaster GPS) the previous day. Our intrusion prompted the anaconda to release its hold, allowing the turtle to escape, apparently unharmed. The anaconda had a total body length of ca. 3.65 m; the turtle's carapace length was ca. 16 cm. Mole (1924. Proc. Zool. Soc. London [1]:235–278; cited in Murphy 1997. Amphibians and Reptiles of Trinidad and Tobago. Krieger Publ. Co., Malabar, Florida. 245 pp.) reported that turtles are included in the diet, but does not list species.We are unaware of other reports of anacondas attempting to eat turtles, and it is unclear whether this attempted predation would have been successful.

We thank Kim Phillips (Hiram College) for allowing us to accompany her to the Bush Bush Wildlife Sanctuary, and C. L.

Abercrombie (Wofford College) for assistance in identification of these species.

Submitted by **CARRIE ELVEY** and **KAREN NEWLON**, Department of Biology, Hiram College, Hiram, Ohio 44234, USA.

HIEROPHIS VIRIDIFLAVUS (Western Whip Snake). **NESTING HABITAT.** The western whip snake (*Hierophis viridiflavus*) is a large (up to 180 cm total length), oviparous colubrid that is widespread and extremely abundant over much of the Italian peninsula (Bruno and Maugeri 1990. Serpenti d'Italia e d'Europa, Editoriale G. Mondadori, Milano, 224 pp.). Little is known about the nesting habitat of this species. This note provides preliminary information on this issue.

On 16 May 1996, a female *H. viridiflavus* (86.0 cm SVL, 15.5 cm tail length) was captured in the internal pinewood (*Pinus pinea*) area of the Forest of Castel Fusano (ca. 20 km W of Rome). Palpation revealed that the snake was gravid. The snake was marked by ventral scale-clipping and released. On 22 May 1996 she was recaptured, 530 m from the site of first capture, in a spot where sandy dunes face the sea. Evidently she was in the process of laying eggs, and in fact egg-laying occurred on 30 May 1996 at 0740 h. Three eggs were deposited in a rodent shelter in the sandy soil. This clutch size is consistent with other data for this species (Capula and Luiselli. 1995. Herpetol. Rev. 26:38–39; Luiselli 1995. Rev. Ecol. [Terre et Vie] 50:365–376). The latest contact with this snake occured on 24 October 1996, when she was seen basking on dry leaves, 37 m from the first capture spot and 480 m from the oviposition site.

Because young snakes were frequently seen in the sandy dunes facing the sea, we suggest that female snakes in general tend to use the sandy dunes facing the sea for nesting.

We thank U. Agrimi, F. M. Angelici, M. Capula, B. Hansen, and C. Sisto for critically reviewing of an earlier draft of the manuscript.

Submitted by **ERNESTO FILIPPI** and **LUCA LUISELLI,** Department of Animal and Human Biology, University of Rome "La Sapienza," via Alfonso Borelli 50, I-00161 Rome, Italy.

LAMPROPELTIS CALLIGASTER CALLIGASTER (Prairie Kingsnake). **ALBINISM.** On 4 September 1996 an amelanistic *Lampropeltis c. calligaster* was collected from under a pile of mulch surrounding a recently planted river birch in Independence, Jackson County, Missouri, USA (T49N, R31W, Sec. 5). The snake (male: 552 mm SVL, 100 mm tail length) is a partial albino with xanthophores, pink eyes, and is similar in appearance to the specimen described by Clark et al. (1983. Herpetol. Rev. 14:120) from adjacent Wyandotte County, Kansas. The snake is currently on display at the Lakeside Nature Center, Kansas City, Missouri, and will be deposited in the Bobby Witcher Memorial Collection at Avila College, Kansas City, Missouri, upon its death.

Submitted by **KEVIN D. HOGAN**, Lakeside Nature Center, 5600 East Gregory Boulevard, Kansas City, Missouri 64132, USA, and **DONALD D. SMITH**, Division of Allergy and Rheumatology, University of Kansas Medical Center, 3901 Rainbow Boulevard, Kansas City, Kansas 66160, USA.

LAMPROPELTIS GETULA FLORIDANA (Florida Kingsnake). Combat Ritual. Combat rituals between male snakes have been recorded in rattlesnakes, *Sistrurus miliarius* (Carpenter 1979. Copeia 1979:638–642) and *Crotalus lepidus* (Carpenter and Murphy 1976. Copeia 1976:764-780), and speckled kingsnakes, *Lampropeltis getula holbrooki* (Carpenter and Gillingham 1977. Southwest. Nat. 22:517–524). Zug (1993. Herpetology: An Introductory Biology of Amphibians and Reptiles. Academic Press, Inc., San Diego, California. 527 pp.) noted that combat rituals in snakes may be performed due to territoriality, or to establish dominance in the presence of a sexually receptive female. Here we describe a combat ritual observed in Florida kingsnakes (*Lampropeltis getula floridana*) in southern Florida. On 7 February 1993, at 1415 h and 24°C, two male *L. g. floridana* were observed along a canal bank just north of Clewiston, in Glades County, Florida, USA. It had been raining all morning, was overcast and very windy. The snakes (116 cm and 130 cm SVL) were first noticed after hearing them rustling in dry grass. The snakes were entwined, with their anterior segments off the ground, biting one another, swaying, and pushing against each other, with each one briefly forcing the other beneath it. After ca. 5 min of observation, both snakes were captured. Both had numerous, bloody bite marks along their bodies, and the largest snake had one hemipenis everted. Although no females were observed in the immediate vicinity, five other *L.g. floridana*, including two females, were captured within 50 m and 0.5 h of these two males, indicating great activity at this time. Our observation suggests that *L.g. floridana* may begin breeding as early as February in southern Florida. All snakes were released at their capture site after data collection.

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PSAMMOPHIS SCHOKARI (Schokari Sand Snake). **DIET.** *Psammophis schokari* is the most widespread and often-encountered snake in Egypt's deserts (pers. obs.); however, little is known about its diet. Flowers (1933. Proc. Zool. Soc. London:735–851) states that he found *P. schokari* hunting in vegetation, probably for lizards of the genera *Mesalina* and *Acanthodactylus*. Schleich et al. (1996. Amphibians and Reptiles of North Africa, Koeltz Scientific Publishers, Koenigstein. 630 pp.) reports *P. schokari* preying on *Agama impalearis*. On 25 June 1997 an immature *Chamaeleo chamaeleon* was found in the stomach of a roadkilled *P. schokari* in the Zaranik Protected Area, North Sinai, Egypt. No other prey was found in the stomach. We believe this is the first record of *C. chamaeleon* in the diet of *P. schokari*. Both specimens were too damaged for measurements. The two species are common and widespread in the sands of North Sinai and share similar desert vegetation microhabitats. The frequency of predation of *C. chamaeleon* by *P. schokari* may thus be potentially high in this region.

We thank Mr. Waheed Salama, Manager of the Zaranik Protected Area, for his hospitality and cooperation.

Submitted by **SHERIF BAHA EL DIN**, Nature Protection Sector, Egyptian Environmental Affairs Agency, 3 Abd Alla El Katib Street, Dokki, Cairo, Egypt, and **OMAR ATTUM**, University of Louisville, 8807 Linn Station Road, Louisville, Kentucky 40222, USA.

RHINOBOTHRYUM LENTIGINOSUM (NCN). **DIET**. Little is known about the diet of the neotropical colubrid *Rhinobothryum lentiginosum*. Cunha and Nascimento (1993. Bol. Mus. Par. Emílio Goeldi sér. Zool. 9:1–191) stated that *R. lentiginosum* feeds on lizards, although they did not provide the number of specimens examined or the lizard taxa found. Here we provide nine substantiated food records of *R. lentiginosum* from Brazilian Amazonia.

Twelve specimens of *R. lentiginosum* were examined. Eleven of these are in the Museu Paraense Emílio Goeldi (MPEG). Data from an additional specimen were provided via personal communication from L. J. Vitt and J. P. Caldwell. The remains of nine prey items were found in six of these snakes (Table 1). Our results indicate that *R. lentiginosum* is a lizard specialist. Further, all prey items are primarily arboreal (unpublished data), indicating that *R. lentiginosum* may forage in the vegetation.

Logistical support and permission to examine snakes at MPEG were kindly provided by T. C. S. Avila-Pires, I. F. F. dos Santos, and A. C. M. Lima. The Conselho Nacional de Desenvolvimento Científico e Tecnológico provided a grant to M. Martins. L. J. Vitt and J. P. Caldwell kindly provided unpublished information.

TABLE 1. Gut contents of six specimens of *Rhinobothrium lentiginosum* from Brazilian Amazonia. TL = total length.

Source	Locality	TL (mm)	Gut contents
MPEG 16570	Marabá, Pará	1480	*Plica plica*
MPEG 16672	Amapá	1279	*Mabuya* sp.
MPEG 16840	Marabá, Pará	1233	*Plica umbra* and the remains of another lizard
MPEG 17011	Marabá, Pará	1275	*Polychrus marmoratus* and the remains of another lizard
MPEG 18779	Benfica, Pará	1046	*Polychrus marmoratus* and the remains of another lizard
Vitt & Caldwell	Altamira, Pará	580	*Gonatodes humeralis*

Submitted by **M. ERMELINDA OLIVEIRA**, Departamento de Parasitologia, Instituto de Ciências Biológicas, Universidade do Amazonas, 69077-000 Manaus, Amazonas, Brazil, and **MARCIO MARTINS**, Departamento de Zoologia, Instituto de Biociências, Universidade Estadual Paulista, Caixa Postal 199, 13506-900 Rio Claro, São Paulo, Brazil.

GEOGRAPHIC DISTRIBUTION

Instructions for contributors to Geographic Distribution appear in Volume 29, Number 1 (March 1998).

CAUDATA

AMBYSTOMA OPACUM (Marbled Salamander). USA: GEORGIA: DOUGHERTY CO: Albany. 18 January 1969. L. R. Davis. INHS 10284. Verified by P. W. Smith. New county record (Williamson and Moulis 1994, Distribution of Amphibians and Reptiles in Georgia. 2 Vols. Savannah Sci. Mus. Spec. Publ. 3:1–712).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

AMBYSTOMA TEXANUM (Smallmouth Salamander). USA: ILLINOIS: CLAY CO: 7.2 km NW Noble. 11 June 1977. R. L. Mayden. INHS 10428. Verified by P. W. Smith. New county record.

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

AMBYSTOMA TIGRINUM (Tiger Salamander). MÉXICO: AGUASCALIENTES: Asientos, Presa "El Llavero" (22°04'N, 102°05'W) in thorn shrub. 17 August 1980. Javier Espinosa and Joel Vásquez-Díaz. Departamento de Biología, Universidad Autónoma de Aguascalientes (UAA-VA 00036-1–4, UAA-VA 00037); at Presa "Charcas Verdes," 2 km E of "La Tinajuela" (22°04'N, 101°55'W). 23 August 1989 (UAA-VA 00152); at "La Tinajuela." 16 August 1993 (UAA-VA 00162). All verified by Mario Mancilla. First records for the state and range extension of 135 km NW Guanajuato (Maldonado-Koerdell 1948. Mem. Revta. Soc. Cient. Antonio Alzate 56(2/3):185–226).

Submitted by **JOEL VAZQUEZ-DIAZ** and **GUSTAVO QUINTERO-DIAZ**, Universidad Autónoma de Aguascalientes. Centro Básico, Departamento de Biología, Avenida Universidad 940, C. P. 20100, Aguascalientes, Aguascalientes, México, and **AURELIO RAMIREZ-BAUTISTA**, Instituto de Biología, Departamento de Zoología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, México, Distrito Federal 04510, México.

AMBYSTOMA TIGRINUM TIGRINUM (Eastern Tiger Salamander). USA: SOUTH CAROLINA: CHESTERFIELD CO: 34°31'N, 80°13'W, ca. 1.5 mi N of U.S. Rt 1 on Wildlife Drive at jct of Wildlife Drive and Little Alligator Creek, Carolina Sandhills National Wildlife Refuge. 27 April 1997. W. B. Blihovde. KU Color Slide 11256. Verified by Lou Ehrhart. First record of an ambystomid salamander on the refuge.

Submitted by **WILLIAM B. BLIHOVDE**, Department of Biology, University of Central Florida, Orlando, Florida 32816-2368, USA.

AMPHIUMA MEANS (Two-toed Amphiuma). USA: LOUISIANA: TANGIPAHOA PARISH: Joyce Wildlife Management Area, ca. 4 km S Ponchatoula. 22 April 1996. John G. Himes and Christo-

pher Sheil. Louisiana State University Mueum of Natural Science (LSU 57944). Verified by Travis W. Taggart. Adult captured by hand in cypress-tupelo gum swamp. Fourth parish record; extends range ca. 19 km S of presently known distribution and represents the southwesternmost record for this species (Dundee and Rossman 1989. Amphibians and Reptiles of Louisiana. Louisiana State University Press, Baton Rouge. 300 pp.; Conant and Collins 1991. Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Third Ed. Houghton Mifflin, Boston, Massachusetts. 450 pp.; Doody et al. 1995. Herpetol. Rev. 26:150).

Submitted by **JOHN G. HIMES**, Museum of Life Sciences, Louisiana State University in Shreveport, One University Place, Shreveport, Louisiana 71115-2399, USA, and **CHRISTOPHER A. SHEIL**, Department of Herpetology, Natural History Museum, University of Kansas, Lawrence, Kansas 66045, USA.

EURYCEA CIRRIGERA (Southern Two-Lined Salamander). USA: GEORGIA: Dougherty Co: N of Albany. 2 March 1969. L.R. Davis. INHS 10038. Verified by P. W. Smith. New county record (Williamson and Moulis 1994. Distribution of Amphibians and Reptiles in Georgia. 2 Vols. Savannah Sci. Mus. Spec. Publ. 3:1–712).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

EURYCEA QUADRIDIGITATA (Dwarf Salamander). USA: GEORGIA: Dougherty Co: Albany. 26 January 1969. L. R. Davis. INHS 10033. Verified by P. W. Smith. New county record (Williamson and Moulis 1994. Distribution of Amphibians and Reptiles in Georgia. 2 Vols. Savannah Sci. Mus. Spec. Publ. 3:1–712).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

ANURA

ACRIS CREPITANS BLANCHARDI (Blanchard's Cricket Frog). USA: ILLINOIS: Livingston Co: 1.6 km W Pontiac, Vermilion River at Co. Rd. 1800N (SE 1/4, SE 1/4 Sec. 17, T28N, R05E; UTM Zone 16: N4527480m, E359910m). 6 September 1995. K. S. Cummings, C. A. Taylor and A. E. Mankowski. INHS 12115. Verified by C. A. Phillips. New county record.

Submitted by **JOHN E. PETZING, KEVIN S. CUMMINGS** and **CHRISTOPHER A. TAYLOR**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

ASCAPHUS TRUEI (Tailed Frog). USA: CALIFORNIA: Shasta Co: Squaw Creek drainage: unnamed tributary of Horse Creek (a tributary of Squaw Creek), 1 km NW Little Bagley Mountain, SE1/4 of NE1/4 Sec. 35, T37N, R2W. 25 September 1993 (16 tadpoles); Pit River drainage: Baker Creek, tributary of Kosk Creek (a tributary of the Pit River), 4 km NW Big Bend, NW1/4 of NW1/4 Sec. 24, T37N, R1W. 30 March 1994 (KU Color Slide 11252,1 tadpole); Pit River drainage, Shotgun and Little Shotgun Creeks, tributaries of Kosk Creek (a tributary of the Pit River), both 5 km NW Big Bend, center of Sec. 13, T37N, R1W. 4 April 1994 (KU Color Slides 11253–254, 2 and 9 tadpoles, respectively). All observations by Lee and Matthew Simons. Ten specimens from the Squaw Creek drainage sample were sent to Redwood Sciences Laboratory for tissue samples (RSL 1456–1465); the balance were released immediately. Representatives from each site of the Pit River drainage samples were photographed and released. Specimens and slides verified by Hartwell Welsh. First records for each drainage (Bury 1968. Herpetologica 24:39–46; Bury et al. 1969. J. Herpetol. 3:157–161). Pit River drainage samples represent easternmost localities for the species in California (Stebbins 1985. Peterson Field Guide to Western Reptiles and Amphibians. Second ed. Houghton Mifflin Co., Boston, Massachusetts 336 pp.; Hartwell Welsh, pers. comm., 17 September 1992). Many sites in the area remain unsampled. Specimens were handled and collected under permits from the California Department of Fish and Game.

Submitted by **LEE H. SIMONS** and **MATTHEW SIMONS**, Shasta Natural History Foundation, 913 Shasta Avenue, Yreka, California 96097-3115, USA.

BUFO CRISTATUS. MÉXICO: PUEBLA: Municipio de Zacapoaxtla, Apulco, Cascada de La Gloria, 1500 m elev. (19°55'N, 97°38'W). 6 July 1995. Emilio Roberto Muñoz. Benemerita Universidad Autonoma de Puebla (EBUAP 544–545). Verified by Adrian Nieto Montes de Oca. Extends the known distribution of this species ca. 40 air km ENE of Tezuitlán, Puebla (Mendelson 1997. Herpetologica 53:278). Both are subadult males (SVL 42.7 mm and 37.7 mm, respectively); found in leaf litter in primary cloud forest near the Cascada (waterfall) de La Gloria. Another specimen (TNHC 54943) of this rare species, brought to our attention by David C. Cannatella, lacks any more precise locality data other than "Mexico." This specimen is an adult male (SVL 68.8 mm) and verifies the speculation by Mendelson (1997 *op cit.*:283) that this species lacks vocal slits. This is not the specimen collected and photographed by R. Altig in 1970 (see Mendelson, *op cit*: Fig 6; the most recent sighting of this species before discovery of the individuals reported herein); Altig's specimen was sent alive to W. F. Blair at TNHC (R. Altig, per. comm.), but evidently never was preserved and deposited in a museum.

Submitted by **JOSEPH R. MENDELSON III**, Department of Biology, Utah State University, Logan, Utah 84322, USA, and **LUIS CANSECO-MARQUEZ**, Laboratorio de Herpetología, Escuela de Biología, Benemerita Universidad Autónoma de Puebla, C.P. 72570, Puebla, México.

BUFO TERRESTRIS (Southern Toad). USA: ALABAMA: Dale Co: Fort Rucker Military Reservation. 10 March 1974. V. L. Morris. INHS 10141. Verified by P. W. Smith. New county record (Mount 1975, The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

CHIASMOCLEIS CAPIXABA. BRAZIL: BAHIA: Nova Viçosa (17°53'S, 39°22'W). 7 April 1997. Monique Van Sluys. Museu Nacional do Rio de Janeiro 18924–19025 and 19052–274. Verified by Ulisses Caramaschi. More than 300 individuals fell in pitfalls along drift fences after a night rain. Species was recently described (Cruz et al. 1997. Alytes 15[2]:49–71) from Aracruz, state of Espírito Santo, and was known only the from type local-

ity. First record for the state of Bahia; extends range ca. 600 km north from type locality and represents the northernmost record for the species. Frogs of the genus *Chiasmocleis* are rarely found in nature due to their short breeding period (Kasahara and Haddad 1997. J. Herpetol. 31:139–142).

Submitted by **MONIQUE VAN SLUYS**, Setor de Ecologia, DBAV, IB, Universidade do Estado do Rio de Janeiro, 20550-013, Rio de Janeiro, Rio de Janeiro, Brazil.

ELEUTHERODACTYLUS COQUI (Puerto Rican Coqui). DOMINICAN REPUBLIC: DISTRITO NACIONAL: Santo Domingo, Calle Rosa Duarte No. 21, Gazcue, Santo Domingo 2, República Dominicana (UPRRP 5746–47) and Calle Eric Leonard Ekman No. 10 (Camino del Oeste), Arroyo Hondo, Santo Domingo, República Dominicana (UPRRP 5748). 15 January 1996. R. L. Joglar, N. Rios-López and I. Cruz. Verified by Richard Thomas. Museo de Biología, Universidad de Puerto Rico-Recinto de Río Piedras. First record for Dominican Republic. One population at each of two localities (each now confined to a residence and backyard), within the city limits. Two calling males were collected at Calle Rosa Duarte No. 21, Gazcue, Santo Domingo 2, República Dominicana. This population presumably is established, because juveniles and subadults also were observed. The owner of the residence at this locality enjoyed the coquis melodious calls and, during a visit to Puerto Rico, paid local kids to collect live specimens for transport to the Dominican Republic. At the second locality, Calle Eric Leonard Ekman No. 10 (Camino del Oeste), Arroyo Hondo, Santo Domingo, República Dominicana, two males were heard calling, and four additional individuals were observed (one collected) on a dry night. In December 1992, owners of the residence at this locality moved from Bayamín, Puerto Rico, to Santo Domingo, Dominican Republic, and took with them their houseplants, in which Coquis probably were transported. One year after our first visit (12 January 1997), several males were heard calling at both residences. *Eleutherodactylus coqui* have been introduced in Vieques and Culebra, Puerto Rico (Rivero and Joglar 1979. Herpetol. Rev. 10:101), St. Thomas and St. Croix, U.S. Virgin Islands, southern Florida and Louisiana (Schwartz and Henderson 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions and Natural History. Univ. Florida Press, Gainesville. 720 pp.) and in 1994 in Maui, Hawaii (R. Campbell, pers. comm.).

Submitted by **RAFAEL L. JOGLAR** and **NEFTALI RIOS-LÓPEZ**, Departamento de Biología, Universidad de Puerto Rico-Recinto de Río Piedras, Apartado 23360, San Juan Puerto Rico 00931-3360.

HYLA CINEREA (Green Treefrog). USA: ALABAMA: DALE CO: Fort Rucker Military Reservation. 4 June 1974. M. A. Morris. INHS 10303. Verified by M. Redmer. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

HYLA SQUIRELLA (Squirrel Treefrog). USA: ALABAMA: DALE CO: 8 km S Daleville. 3 August 1974. J. C. Morris. INHS 10143. Verified by M. Redmer. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

HYLA VIGILANS. VENEZUELA: FALCÓN: Municipio Monseñor Iturriza, Sanare (ca. 10°52'N, 68°23'W). No date. Ramón A. Rivero. EBRG 2968. Verified by Jesús Manzanilla. First report from the state of Falcón, and the northwesternmost report of the species (La Marca 1992, Cuad. Geogr. Univ. Los Andes, Mérida 9:1–197).

Submitted by **ABRAHAM MIJARES-URRUTIA**, **ALEXIS ARENDS**, Centro de Investigaciones en Ecología y Zonas Áridas (CIEZA), Universidad Francisco de Miranda, Apartado 7506, Coro 4101-A, Venezuela (e-mail: amijares@funflc.org.ve/aarends@reacciun.ve) and **RAMÓN A. RIVERO**, Estación Biológica El Limón, Servicio Autónomo PROFAUNA, Ministerio del Ambiente y de los Recursos Naturales Renovables, Apartado 184, Maracay, Venezuela.

OSTEOPILUS SEPTENTRIONALIS (Cuban Treefrog, Rana Platanera). PUERTO RICO: COAMO: (18°05'00"N, 66°21'30"W) at the Criminal Investigation Bureau building. 13 July 1997. Sr. Norat, Sergio Serrano, and Carlos Rosa. Verified by Richard Thomas. Museo de Biología, Universidad de Puerto Rico-Recinto de Río Piedras. (UPRRP 5749). One adult female was collected. New record; extends range ca. 50 km southwest and is first record for the southern part of island. Species was introduced in Puerto Rico in the 1950s (Thomas and Joglar 1996. *In* J. Figueroa, ed., The Scientific Survey of Puerto Rico and The Virgin Islands, pp. 181–196. Ann. New York Acad. Sci. Vol. 776). In 1978, the frog was reported as inhabiting the Aguadilla, Isabela, Quebradillas area in northwestern Puerto Rico (Rivero 1978. Los Anfibios y Reptiles de Puerto Rico. Editorial Universitaria U. P. R. San Juan. 152 pp.). By 1995, it had expanded its range ca. 100 km east into northeastern Puerto Rico (Joglar and Rios López 1995. Herpetol. Rev. 26:105–106).

Submitted by **RAFAEL L. JOGLAR**, **NEFTALÍ RIOS-LÓPEZ**, and **MARÍA CARDONA**, Departamento de Biología, Universidad de Puerto Rico-Recinto de Río Piedras, Apartado 23360, San Juan Puerto Rico 00931-3360.

POLYPEDATES LEUCOMYSTAX (Java Whipping Frog). JAPAN: OKINAWA PREFECTURE: Miyakojima Island, Miyako Island Group, in sugarcane field in the town of Gusukube, ca. 2.7 km SSE Miyako Branch of Okinawa Prefectural Agricultural Experiment Station, 22°44'70"N, 125°20'57"E. 12 February 1998. Setsuko Iwanaga. Zoological Collection of Kyoto University (KUZ 47305). Verified by Hidetoshi Ota. Adult male perched on sugarcane stalk. First record for island group. Species was artificially introduced into Japan from southeastern Asia after World War II. In Japan, its range has been confined to Okinawajima and a few adjacent islets of the Okinawa Island Group (Ota 1995. Island Stud. Okinawa 13:63–78).

Submitted by **SETSUKO IWANAGA**, Laboratory of Sugarcane Insect, Okinawa Prefectural Agricultural Experiment Station, 4-222 Sakiyama, Naha, Okinawa 903-0814, Japan.

PSEUDACRIS CRUCIFER (Spring Peeper). USA: ILLINOIS: JASPER CO: 6.25 km SSE Newton and just SW (5 m) jct of Co. Rd. 1000E and Co. Rd. 500N (NW 1/4, NW 1/4 Sec. 34, T6N, R9E; UTM Zone 16: N4308455m, E396970m). 6 August 1997. D. J.

Olson. Illinois Natural History Survey (INHS 13869). Verified by C. A. Phillips. New county record filling gap in expected distribution (Smith 1961. The Amphibians and Reptiles of Illinois. Illinois Nat. His. Surv. Bull. 298 pp.).

Submitted by **DANIEL J. OLSON**, Department of Biological Sciences, Eastern Illinois University, Charleston, Illinois 61920, USA.

PSEUDACRIS CRUCIFER (Spring Peeper). USA: LOUISIANA: BEAUREGARD PARISH: Camp Edgewood area, from jct U.S. Rt. 171 and U.S. Rt. 190 at Ragley, 6.5 mi S on U.S. Rt. 171, 6 mi W on Camp Edgewood Road. 6 February 1986. Doyle, Esters, and Thomas. Seale Museum of Louisiana, McNeese State University (SML 8483). 10 March 1987. Goodwin and Lovinggood. SML 8544. Both specimens verified by Jeff Boundy. First parish record as mapped by Dundee and Rossman (1989, The Amphibians and Reptiles of Louisiana, Louisiana St. Univ. Press, Baton Rouge. 300 pp.).

Submitted by **AVERY A. WILLIAMS**, Division of Sciences, Louisiana State University at Eunice, Eunice, Louisiana 70535, USA.

PSEUDACRIS FERIARUM (Upland Chorus Frog). USA: LOUISIANA: JEFFERSON DAVIS PARISH: Topsy area, from U.S. Rt. 190 at Bel, 8 mi S on Topsy-Bel Road. 12 February 1998. Avery A. Williams. Seale Museum of Louisiana, McNeese State University (SML 9314–15). Both specimens verified by Jeff Boundy. First parish record (Dundee and Rossman 1989. The Amphibians and Reptiles of Louisiana, Louisiana St. Univ. Press, Baton Rouge. 300 pp.).

Submitted by **AVERY A. WILLIAMS**, Division of Sciences, Louisiana State University at Eunice, Eunice, Louisiana 70535, USA.

PSEUDACRIS TRISERIATA (Upland Chorus Frog). USA: GEORGIA: DOUGHERTY CO: Albany. 18 January 1969. L. R. Davis. INHS 10216. Verified by P. W. Smith. New county record (Williamson and Moulis 1994. Distribution of Amphibians and Reptiles in Georgia. 2 Vols. Savannah Sci. Mus. Spec. Publ. 3:1–712).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

RANA BLAIRI (Plains Leopard Frog). USA: ILLINOIS: GREENE CO: DOR, Hillview-Eldred Road, 8.75 km N Eldred at Apple Creek, SE 1/4, NE 1/4 Sec. 28, T11N, R13W. 19 April 1997. J. K. Tucker. Illinois Natural History Survey (INHS 13744). Verified by C. A. Phillips. New county record.

Submitted by **JOHN K. TUCKER**, Illinois Natural History Survey, Great Rivers Field Station, 4134 Alby Street, Alton, Illinois 62002, USA, and **DANIAL A. WARNER**, Department of Animal Ecology, Iowa State University, Ames, Iowa 50011, USA.

RANA CLAMITANS (Green Frog). USA: ILLINOIS: PIKE CO: 3.5 km SSE Kinderhook, Grubb Hollow along Co. Rd. 1950N, just E Ill. Rt. 96 (SE 1/4 Sec. 31, T14S, R6W; UTM Zone 15: N4393040m, E660150m). 21 October 1997. J. E. Petzing and C. A. Phillips. INHS 13402. Verified by M. J. Dreslik. New county record.

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

RANA CLAMITANS (Green Frog). USA: MISSOURI: PERRY CO: 19 km E Perryville (37°42'07"N, 89°37'12"W) by a spring. 15 October 1994. B. Churchwell, J. Krejca, and S. Taylor. SIUC H-4776. Verified by R. A. Brandon. County record; fills gap between Bollinger, Cape Girardeau, St. Francois, and Ste. Genevieve counties (Johnson 1987. The Amphibians and Reptiles of Missouri. Publ. Missouri Dept. Conserv., Jefferson City. 368 pp; Powell et al. 1993, Missouri Herpetol. Assoc. Newsl. 6:7–26).

Submitted by **STEVEN J. TAYLOR**, Center for Biodiversity, Illinois Natural History Survey, 607 East Peabody Drive, Champaign, Illinois 61820, USA, **JEAN K. KREJCA**, Department of Zoology, University of Texas, Austin, Texas 78712-1064, USA, and **BETH CHURCHWELL**, The Nature Conservancy, 2800 South Brentwood Boulevard, St. Louis, Missouri 63144, USA.

RANA CLAMITANS CLAMITANS (Bronze Frog). USA: ILLINOIS: KANE CO: West branch Big Rock Creek and Rt. 30, Sec. 21, T38N, R6E. 27 August 1970. D.W. Greenfield and Gary Decker. NIU-HDW (1614). Verified by P. L. Meserve. New county record.

Submitted by **HARLAN D. WALLEY**, Northern Illinois University, Dekalb, Illinois 60115, USA.

SCAPHIOPUS COUCHII (Couch's Spadefoot) USA: COLORADO: OTERO CO: AOR, Co. Rd. 2, 2.4 mi S jct. Co. Rd. KK. 24 August 1997. University of Northern Colorado Museum of Natural History (UNC-MNH Photograph 27). Verified by Hobart M. Smith and David Chiszar. Specimen represents a range extension of ca. 40 mi NW of known Colorado populations (Livo et al. 1996. Herpetological Micro-biogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **CHAD MONTGOMERY**, **JAMES SIFERT**, **BEN HILL**, **THERESA CHILDERS**, **JERRY D. MANZER**, **ENOCH BERGMAN** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

SPEA MULTIPLICATA (New Mexico Spadefoot). USA: COLORADO: PUEBLO CO: Line 27, Station 2. 24 July 1967. Collector unknown. UCM 59555-59556; Boone, Grid A, Line 1, Station 25-28. 30 June 1967. Collector unknown. UCM 59557. Both verified by Hobart M. Smith. New county record (Hammerson 1982. Amphibians and Reptiles in Colorado. Publ. Colorado Division of Wildlife).

Submitted by **KYLE G. ASHTON**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA.

SYRRHOPHUS CYSTIGNATHOIDES (Rio Grande Chirping Frog) USA: TEXAS: FAYETTE CO: fairgrounds (29°55'31"N, 96°52'54"W) below sandstone cliffs on hill along the Colorado River flood plain. Juvenile female collected 11 February 1998; adult male collected 8 March 1998. Andre de la Reza, Collin Balcombe, and Todd Schlenke. Verified by David Cannatella. TNHC 56738–39 (DCC 3566–67). This resident of the Rio Grande Valley was probably introduced into the San Antonio, Houston, Fort Worth, and Tyler areas via the potted plant trade (Brach 1992.

Texas J. Sci. 44:490; Dixon 1987. Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station, 434 pp; McGown et al. 1994. Herpetol. Rev. 25:32). This also seems the most likely reason for its introduction into Fayette County.

Submitted by **ANDRE G. DE LA REZA**, **COLLIN BALCOMBE**, and **TODD SCHLENKE**, Department of Zoology, University of Texas, Austin, Texas 78712, USA.

TESTUDINES

CHELYDRA SERPENTINA SERPENTINA (Common Snapping Turtle) USA: COLORADO: Kiowa Co: Adobe Creek beneath Co. Rd. E, 1.4 mi E jct Rt. 96. 11 May 1997. University of Northern Colorado Museum of Natural History (UNC-MNH Photograph 22). Verified by Hobart M. Smith and David Chiszar. County record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **JUSTIN HOBERT**, **CHAD MONTGOMERY**, **THERESA CHILDERS**, **JERRY D. MANZER**, **ENOCH BERGMAN**, **JAMES SIFERT**, **BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

GRAPTEMYS OUACHITENSIS (Ouachita Map Turtle). USA: KANSAS: Russell Co: Wilson Reservoir, Sec. 32, T12S, R12W. 25 October 1996. Tommie Berger. KU 224654. Verified by Lynnette Sievert. New county record; represents the most northwestern record for Kansas (Collins 1993. Amphibians and Reptiles in Kansas. Third Ed. Univ. Press Kansas, Lawrence. xx + 397 pp.).

Submitted by **GREGORY SIEVERT**, Division of Biological Sciences, Emporia State University, Emporia, Kansas 66047, USA, and **JOSEPH T. COLLINS**, The Center for North American Amphibians and Reptiles, 1502 Medinah Circle, Lawrence, Kansas 66047, USA.

KACHUGA SMITHII SMITHII (Brown Roofed Turtle). NEPAL: border of Saptari/Sunsari Districts (Koshi River at Koshi Barrage, 26°32'N, 86°55'E). 20 June 1996. David Edds. Chitwan National Park (Nepal) turtle collection (DE-NT 9). Verified by T. M. Maskey. First record of this subspecies from Nepal. Moll (1987. J. Bombay Nat. Hist. Soc. 84:7–25) described a new subspecies, *K. s. pallidipes,* including a paratype from the Karnali River in western Nepal (three specimens of which were captured in the Karnali by the author in 1996: DE-NT 10–12); characteristics of this single specimen from eastern Nepal clearly correspond to those of the nominate race, including profuse pigmentation of the head, limbs, penis, and plastron. Sympatric with *K. tentoria flaviventer.* Mitchell and Rhodin (1996. Chelonian Conserv. Biol. 2:66–72) noted decorated shells of *K. smithii* for sale as ceremonial artifact masks in Kathmandu.

Submitted by **DAVID EDDS**, Division of Biological Sciences, Emporia State University, Emporia, Kansas 66801, USA.

KACHUGA TECTA (Indian Roofed Turtle). NEPAL: Nawalparasi District (Narayani River at Tribenighat 27°27'N, 83°55'E). 10 April 1996. David Edds. Chitwan National Park (Nepal) turtle collection (DE-NT 6). Verified by T. M. Maskey. Second record from Nepal, following Hall (1980. J. Bombay Nat. Hist. Soc. 77:521–522), and extending Nepal distribution ca. 215 km west. Das (1991. Colour Guide to the Turtles and Tortoises of the Indian Subcontinent. R & A Publishing Ltd., Avon, England. 133 pp.) and Mitchell and Rhodin (1996. Chelonian Conserv. Biol. 2:66–72) noted Hall's record from eastern Janakpur (Dhanusa District); Moll (1987. J. Bombay Nat. Hist. Soc. 84:7–25) and Iverson (1992. A Revised Checklist with Distribution Maps of the Turtles of the World. Richmond, Indiana. 363 pp.) suspected the species existed in Nepal. In vegetation-choked waters; sympatric with *K. tentoria flaviventer.*

Submitted by **DAVID EDDS**, Division of Biological Sciences, Emporia State University, Emporia, Kansas 66801, USA.

KACHUGA TENTORIA FLAVIVENTER (Yellowbelly Indian Tent Turtle). NEPAL: Nawalparasi District (Narayani River at Tribenighat 27°27'N, 83°55'E) and border of Saptari/Sunsari Districts (Koshi River at Koshi Barrage 26°32'N, 86°55'E). 10 April 1996 and 20 June 1996. David Edds. Chitwan National Park (Nepal) turtle collection (DE-NT 7–8). Verified by T. M. Maskey and K. B. Shah. First records of *K. tentoria* from Nepal. In vegetation-choked waters; sympatric with *K. tecta* in Narayani, and with *K. s. smithii* in Koshi. Moll (1987. J. Bombay Nat. Hist. Soc. 84:7–25), Das (1991. Colour Guide to the Turtles and Tortoises of the Indian Subcontinent. R & A Publishing Ltd., Avon, England. 133 pp.) and Iverson (1992. A Revised Checklist with Distribution Maps of the Turtles of the World. Richmond, Indiana. 363 pp.) noted *K. t. flaviventer* from tributaries of the Ganges River in northern India.

Submitted by **DAVID EDDS**, Division of Biological Sciences, Emporia State University, Emporia, Kansas 66801, USA.

TERRAPENE ORNATA (Ornate Box Turtle). USA: TEXAS: Rockwall co: Rockwall. 12 May 1997. Photographed by Dixon Glaze. The specimen was found on private property and was only allowed to be photographed. Verified by C. J. Franklin. University of Texas at Arlington (UTA Color Slide 23641). New county record (Dixon 1987. Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.).

Submitted by **CARL J. FRANKLIN**, Dallas Zoo, Department of Herpetology, 650 South R. L. Thorton Freeway, Dallas, Texas 75203, USA, and **DIXON GLAZE**, Rockwall, Texas, USA.

TRACHEMYS SCRIPTA (Slider). USA: ALABAMA: Wilcox Co: 2.4 km W Camden and 0.8 km E jct Alabama Rts. 221/164, backwater of Alabama River at Alabama Rt. 10 (31°59.573'N, 87°19.613'W). 12 March 1996. J. M. Serb and T. J. Near. INHS 12254. Verified by C. A. Phillips. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JEANNE M. SERB**, **THOMAS J. NEAR,** and **JOHN E. PETZING**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

LACERTILIA

AMEIVA BIFRONTATA. VENEZUELA: ESTADO ARAGUA: Municipio Mario Bricego Iragori, trail between Bahía de Cata and Playa Catica, Parque Nacional Henri Pittier, 10°30'N, 67°44'W, 90 m elev. February 1993. R. Cornieles. Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay (MIZA 15-354, 15-355) Verified by R. Rivero. Specimens constitute the first record for the state of Aragua and the Parque Nacional Henri Pittier

(Manzanilla 1996. Acta Cient. Venezuela 47[3]:1–12) and fill the distributional gaps between the states of Miranda and Sucre in the east, and the state of Falcon in the west (Lesn and Ruiz 1971. Caribbean J. Sci. 11[3-4]:195–201; Cordero 1987. Acta Cient. Venezuela 38:234–258; Bisbal 1990. Acta Cient. Venezuela 41[3]:177–185).

Submitted by **JESUS MANZANILLA**, **RICARDO CORNIELES,** and **ALBERTO FERNANDEZ-BADILLO**, Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Venezuela.

ANOLIS CAROLINENSIS (Green Anole). USA: GEORGIA: CANDLER CO: 1.6 km W Metter. 23 June 1977. L. M. Page, M. A. Morris, and R. L. Mayden. INHS 10407. Verified by P. W. Smith. New county record (Williamson and Moulis 1994. Distribution of Amphibians and Reptiles in Georgia. 2 Vols. Savannah Sci. Mus. Spec. Publ. 3:1–712).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

GALLOTIA GALLOTI EISENTRAUTI. SPAIN: CANARY ISLAND: EL HIERRO ISLAND: El Matorral, Frontera (UTM 3075789/203253). 16 May 1997. Miguel A. Rodríguez-Domínguez. Recovering Center for The Hierro's Giant Lizard, Canary Government (CR 971116). Verified by M. Molina-Borja. First record for El Hierro island. Adult male collected in a tropical pineapple property with several fruit-bearing trees. Two other live individuals were observed, but not captured. The subspecies was known only from Tenerife Island (Bischoff 1982. Bonn. zool. Beitr. 33:363–382). The method of introduction of this species is not known. However, the area where lizards were found is very close to an Agriculture Product Cooperative, and merchandise trucks arrive regularly from Tenerife. We believe that they have been recently and accidentally introduced by humans in this manner to El Hierro Island.

Submitted by **MIGUEL A. RODRÍGUEZ-DOMÍNGUEZ** and **MIGUEL RUÍZ-CABALLERO**, Recovering Center for The Hierro's Giant Lizard, Canary Government, Frontera 38911, El Hierro, Canary Islands, Spain.

GERRHONOTUS LIOCEPHALUS (Texas Alligator lizard). MÉXICO: AGUASCALIENTES: Los Alisos, Sierra del Laurel, municipality of Calvillo (21°58'N, 102°45'W) in oak forest. 22 October 1983. Gilfredo de la Riva. Departamento de Biología, Universidad Autónoma de Aguascalientes. Verified by Mario Mancilla. Nearest records of *G. l. liocephalus* are from 3 km N Pueblo Nuevo, Municipio El Salto, 9 km SE Llano Grande, Municipio Durango, Durango, and 19.2 km NE Santa Lucía, 1990 m, in Sinaloa (Good 1994. Herpetol. Monogr. 8:180–202).

Submitted by **AURELIO RAMIREZ-BAUTISTA**, Instituto de Biología, Departamento de Zoología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, México, Distrito Federal 04510, México, **JOEL VAZQUEZ-DIAZ** and **GUSTAVO QUINTERO-DIAZ**, Universidad Autónoma de Aguascalientes, Centro Básico, Departamento de Biología, Avenida Universidad 940, C.P. 20100, Aguascalientes, Aguascalientes, México.

HOLBROOKIA MACULATA BUNKERI (Bunker's Earless Lizard). NEW MEXICO: DOÑA ANA CO: 32–55 km E El Paso. 27 June and 1 August 1970. W. S. Parker. LACM 113389–90. LUNA CO: 8 km E and 2 km S Hermanas. 22 June 1992. J. N. Stuart. MSB 54265. All verified by Ralph W. Axtell. First record for New Mexico (Degenhardt et al. 1996. Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. 431 pp.) and United States. Supported by range extensions northward from previous records on the dunes near Samalayuca, Chihuahua, México, at El Tule [Escuela Nacional de Estudios Profesionales Iztacala (= ENEPI) field nos. 36320–3, 36326]; Los Chontes (ENEPI 36327, 36339–40); Las Coates (ENEPI 36356); and eastward, at Puerto Ancho (ENEPI 36367–70), Chihuahua, collected in June 1997 by four of the authors and Adam Chiszar. The New Mexico specimens include two males with T/SV ratios of 1.25 and 1.37, and one female with a ratio of 0.91, all within the known range of *H. m. bunkeri* (males 1.0–1.37, females 0.91–1.14). The available UCM material of the other subspecies in New Mexico have ratios in *H. m. approximans* (auctorum) of 0.70–1.02 in 20 males, and 0.62–0.90 in 25 females from various localities in western New Mexico, southwestern Colorado and central eastern Arizona, and in *H. m. ruthveni* of 0.87–0.97 in 14 males, 0.72–0.90 in 10 females.

Submitted by **HOBART M. SMITH**, **DAVID CHISZAR**, **CLINT HENKE,** and **FRANK VAN BREUKELEN**, University of Colorado Museum, Boulder, Colorado 80309-0218, USA; and **JULIO A. LEMOS-ESPINAL**, Laboratorio de Ecologia, Unidad de Biologia, Tecnologia y Prototipos, Escuela Nacional de Estudios Profesionales Iztacala, Universidad Nacional Autónoma de México, Apartado Postal 314, Tlalnepantla, Estado de México, México.

LEPIDODACTYLUS LUGUBRIS (Mourning Gecko). ECUADOR: GALAPAGOS ISLANDS: Isla Santa Cruz in Puerto Ayora. 14 June 1997. Showichi Sengoku. Japan Wildlife Research Center Photo Collection Color Slide No. 97060125. Verified by Hidetoshi Ota. Several individuals around garden lanterns of the Hotel Galapagos at night (1800-2400 h). A number of individuals of this gecko, together with few *Phyllodactylus galapagensis* (Galapagos Leaf-toed Gecko), observed not only around garden lanterns, but also on outside walls of the hotel during the second visit from 25–29 June 1997. Islands record; lending support to Hoogmoed (1989. Not. Galapagos [47]:12–16), who listed this species as occurring in the Galapagos Islands, but without providing evidence.

Submitted by **SHOWICHI SENGOKU**, Japan Wildlife Research Center, Yushima 2-29-3, Bunkyo-ku, Tokyo 113, Japan.

PHRYNOSOMA CORNUTUM (Texas Horned Lizard) USA: COLORADO: PUEBLO CO: DOR, Co. Rd. 10, 0.2 mi NE Co. Rd. 707 (Pipeline Road). 24 August 1997. University of Northern Colorado Museum of Natural History (UNC-MNH 797). Verified by Hobart M. Smith and David Chiszar. County record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **CHAD MONTGOMERY**, **THERESA CHILDERS**, **JERRY D. MANZER**, **ENOCH BERGMAN**, **JAMES SIFERT**, **BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

PHRYNOSOMA DITMARSI (Rock Horned Lizard). MÉXICO: SONORA: thornscrub hillside at El Chorro, 8 km (by road) NE

of Nácori Chico (Municipio Nácori Chico), ca. 1000 m elev. 4 September 1984. C. H. Lowe and B. E. Martin. UAZ 45884 (male, SVL 64 mm) with 11 color slides. Verified by Peter A. Holm and Philip C. Rosen. This is only the fourth known locality record for an endemic Sonoran species whose existence was lost to science for 73 years (Lowe et al. 1971. J. Arizona Acad. Sci. 6[4]:277; Roth 1997. Sonoran Herpetologist 10:2–6; Sherbrooke 1997. Sonoran Herpetologist 10[1]:6–8). The new locality is 140 km NNE of another report, also in the drainage of the Río Yaqui (Perrill 1983. Herpetol. Rev. 14:123], whereas the two earlier locality reports (Lowe et al. 1971, *op. cit.*; Lowe and Howard 1975. Southwest. Nat. 20:264–270) were in the more westerly Río Sonora drainage (Baviacora is 115 km directly west) in Madrean evergreen woodlands. Both Río Yaqui localities establish the use of thornforest/scrub habitat by this species, and suggest that additional populations, perhaps isolated in varied habitats, may be located. Currently the Rock Horned Lizard is listed as threatened by the Mexican government, but remains unstudied in the field.

Submitted by **WADE C. SHERBROOKE**, Southwestern Research Station, American Museum of Natural History, P.O. Box 16553, Portal, Arizona 85632, USA, and **BRENT E. MARTIN** and **CHARLES H. LOWE**, Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, Arizona 85721, USA.

PHRYNOSOMA DOUGLASII (Short-horned Lizard) USA: COLORADO: Kiowa Co: DOR, Co. Rd. E, 0.2 mi E jct. Rt. 96 (38°19.434'N, 103°20.611'W). 15 August 1997. University of Northern Colorado Museum of Natural History (UNC-MNH 767). Verified by Hobart M. Smith and David Chiszar. County record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **ENOCH BERGMAN**, **BEN HILL**, **CHAD MONTGOMERY**, **THERESA CHILDERS**, **JERRY D. MANZER**, **JAMES SIFERT**, and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

SCELOPORUS UNDULATUS (Fence Lizard). USA: ALABAMA: Escambia Co: W of Brewton, Burnt Corn Creek at Ala. Rt. 41 (31°07.776'N, 87°05.253'W). 11 March 1996. P. A. Ceas, J. M. Serb, J. C. Porterfield, and T. J. Near. INHS 12250. Verified by C. A. Phillips. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JEANNE M. SERB**, **JOHN E. PETZING**, and **THOMAS J. NEAR**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

TROPIDURUS STROBILURUS (Lava Lizard). BRAZIL: ESPIRITO SANTO: Município de Presidente Kennedy, Praia das Neves (21°16'S, 40°48'W). 30 January 1996. G. J. Zerbini and A. F. B. Araujo. Universidade de Brasília (UnB 2175). Verified by G. R. Colli. First record for the state of South Espírito Santo; known along the Atlantic Forest from the state of Pernambuco to Santa Cruz in the state of Espírito Santo (Jackson 1978. Arq. Zool. São Paulo 30:1–79). Praia das Neves is the most meridional record for this species and about 250 km S of Santa Cruz. The specimens were found in an isolated 70 ha fragment of "Mata de Restinga" vegetation, about 1 km from the beach.

Submitted by **GLAUCIA JORDÃO ZERBINI**, **ELISABETH M. M. DA COSTA**, **ALEXANDRE F. B. ARAUJO**, and **REUBER A. BRANDÃO**, Departamento de Zoologia-ZOO/IB, Universidade de Brasília, 70 910-900, Brasília, Distrito Federal, Brazil.

SERPENTES

AGKISTRODON CONTORTRIX (Copperhead). USA: ALABAMA: Dale Co: Fort Rucker Military Reservation. 14 April 1974. M. A. Morris and S. S. Morris. INHS 10165. Verified by P. W. Smith. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

CROTALUS TIGRIS (Tiger Rattlesnake). USA: ARIZONA: Cochise Co: Peloncillo Mountains, Sec. 32, T22S, R32E. 30 July 1995. Andrew T. Holycross. Museum of Vertebrate Zoology (MVZ photograph). Verified by Harry W. Greene. A female *C. tigris* was captured crossing Geronimo Trail 3.2 km E of the Cottonwood Cemetery driveway among foothills dominated by *Fouqueria* and *Opuntia* spp. Specimen photographed and blood taken from the caudal vein. Extends range 17 km N of Guadalupe Canyon and the only other specimen reported from this range (Painter and Milensky 1993. Herpetol. Rev. 24:155–156) and E of the Santa Rita Mountains in southeastern Arizona.

Submitted by **ANDREW T. HOLYCROSS**, Zoology Department, Arizona State University, Tempe, Arizona 85287-1501, USA.

DIADOPHIS PUNCTATUS (Ringneck Snake). USA: ALABAMA: Dale Co: Fort Rucker Military Reservation. 13 February 1971. M. A. Morris. INHS 10158. Verified by P. W. Smith. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

DINODON RUFOZONATUM (Red Banded Snake). RUSSIA: PRIMORSKY REGION: Nadezhdinsky District: ca. 15 km W Venevitinovo Village near Bolshevistsky Creek, 2 km upstream from its jct with Malaya Elduga River, 43°28'N, 141°25'E. 8 July 1995. A. Kotlobay and D. Maslov. Zoological Museum of M. V. Lomonosov University, Moscow, Russia (Cat. No. R-10294). Verified by V. F. Orlova. Confirms previous unverified records of species for Primorsky region (Zhao and Adler 1993. Herpetology of China. Publ. Soc. Study Amphib. Rept., Oxford, Ohio. 522 pp.). The female specimen was captured in rubbish near the creek. In 1987, another adult was captured and one more was sighted by D. Maslov in the M. Elduga River Valley on a forest road, flooded after a strong rain. In 1988, an adult was captured near a hunter's cabin at Bolshevistsky Creek by P. Tupeleev. In 1989, a dead adult was found by V. Solkin near the river.

Submitted by **DMITRI A. MASLOV**, Department of Biology, University of California, Riverside, California 92521, USA, and

ANATOLY A. KOTLOBAY, Department of Biochemistry, School of Biology, Moscow State University, 119899 Moscow, Russia.

ELAPHE EMORYI (Great Plains Rat Snake). USA: NEW MEXICO: Otero Co: White Sands Missle Range, Range Road 9 at Malpais Springs, ca. 27.4 km W and 23.3 km N Tularosa. 31 July 1997. Doug Burkett and Larry Kamees. University of New Mexico Museum of Southwestern Biology (MSB 60999). Verified by D. S. Sias. New county record (Degenhardt et al. 1996. Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. xix + 431 pp.).

Submitted by **DOUG BURKETT** and **LARRY KAMEES**, P.O. Box 399, White Sands Missle Range, New Mexico 88002, USA, and **CHARLES W. PAINTER**, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, USA.

ELAPHE GUTTATA (Corn Snake). USA: ALABAMA: Dale Co: Fort Rucker Military Reservation. 20 July 1974. M. A. Morris and R. C. Morris. INHS 10166. Verified by P. W. Smith. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

ELAPHE GUTTATA EMORYI (Great Plains Rat Snake). USA: COLORADO: Prowers Co: AOR Co. Rd. 13, 0.1 mi N Baca Co. line. 3 June 1997. University of Northern Colorado Museum of Natural History (UNC-MNH Photograph 23). Verified by Hobart M. Smith and David Chiszar. Adult specimen; represents a southeast range extension of ca. 35 miles and northwestern extension of 40 miles. A hatchling second specimen (Baca County, on canyon wall east side of Co. Rd. 30 at Two Buttes Dam on 23 September 1997) was found within 1 mile of the first specimen (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **CHAD MONTGOMERY**, **LEEANN COMPTON**, **THERESA CHILDERS**, **ENOCH BERGMAN**, **JERRY D. MANZER**, **JAMES SIFERT**, **BEN HILL**, and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

ELAPHE GUTTATA MEAHLLMORUM (Southern Plains Rat Snake) MÉXICO: HIDALGO: Huejutla: Huejutla, Hotel Rivera (21°08'36"N, 98°25'12"W), ca. 150 m elev. 1 November 1995. Ricardo Reyes Avila. Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autonoma de México (MSFC 8436). Verified by Andrián Nieto Montes de Oca. First record for Hidalgo; extends range ca. 152.8 km SE and 126.4 km E of closest known localities at 30 mi N Valles, San Luis Potosí and Old Mill at Hacienda San Nicolás Conca (Sharpton's Finca), 10.4 mi S Arroyo Seco, San Luis Potosí, as reported by Smith et al. (1994. Texas J. Sci. 46:259–292). The presence of this species in Huejutla is probably due to human introduction.

Submitted by **FERNANDO MENDOZA QUIJANO**, Instituto Tecnológico Agropecuario No. 6, Km 5.5 Carr. Huejutla-Chalahuiyapa, Apartado Postal 94, Huejutla de Reyes, C.P. 43000, Hidalgo, México, (e-mail: mendoza@mail.ibiología.unam.mx), **RICARDO REYES AVILA** and **LAURA CONTRERAS NARVAEZ**, Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autonoma de México, Apartado Postal 70-399, México Distrito Federal 04510, México.

ELAPHE OBSOLETA LINDHEIMERII (Texas Rat Snake). USA: COLORADO: Kiowa Co: DOR, Rt. 287, 1.6 mi S jct. Co. Rd. N (38°25.046'N, 102°43.763'W). University of Northern Colorado Museum of Natural History (UNC-MNH 848). Verified by Hobart M. Smith and David Chiszar. First state record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.); specimen represents a range extension of ca. 200 miles from Kansas populations of *Elaphe obsoleta* and ca. 180 miles from Oklahoma populations of *E. o. lindheimerii* (Conant and Collins 1991. Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Third edition. Houghton Mifflin Co., Boston, Massachusetts. xviii + 450 pp.).

Submitted by **CHAD MONTGOMERY**, **THERESA CHILDERS**, **JERRY D. MANZER**, **ENOCH BERGMAN**, **JAMES SIFERT**, **BEN HILL**, and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

FARANCIA ABACURA (Mud Snake). USA: GEORGIA: Calhoun Co: 2.4 km S Leary. 13 May 1972. L. R. Davis. INHS 10003. Verified by P. W. Smith. New county record (Williamson and Moulis 1994. Distribution of Amphibians and Reptiles in Georgia. 2 Vols. Savannah Sci. Mus. Spec. Publ. 3:1–712).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

GOMESOPHIS BRASILIENSIS (Brazilian Burrowing Snake). BRAZIL: DISTRITO FEDERAL: Estação Ecológica de Águas Emendadas: Lagoa Bonita (15°35'S, 47°41'W). 26 May 1992. Reuber A. Brandão and Victor S-J Perdigão. Universidade de Brasília (UNB 2970). Verified by T. de Lema. First record for central Brazil. Species was known from states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo and Minas Gerais (Peters and Orejas-Miranda 1970. Bull. U.S. Natl. Mus. 297:1–347). In Estação Ecológica de Águas Emendadas, streams of three major Brazilian hydrographic basins (Amazon, São Francisco, and Platina) come together. The Rio Mestre D´Armas belongs to the Platina Basin and its margins are covered with gallery forest, which may represent a pathway for faunal dispersal (Vanzolini 1994. Ann. Acad. Bras. Ci. 66 [supl.1]:173–176) between the Cerrado (mainly known as "Chapadas do Brasil Central") and neighboring vegetational systems, and contributes to lower the level of endemism found in the Cerrado (Cerqueira 1982. *In* Mares and Genoways (eds.), Mammalian Biology in South America, pp. 53–75. Univ. Pittsburgh Press, Pittsburgh, Pennsylvania). This new distributional record may corroborate their hypothesis.

Submitted by **ANA LÚCIA DA COSTA PRUDENTE**, Curso de Pós-Graduação em Zoologia, Universidade Federal do Paraná, CP 19020, CEP 81.531-990, Curitiba, Paraná, Brazil, and **REUBER A. BRANDÃO**, Laboratório de Fisiologia Animal - CFS/IB, Universidade de Brasília, CEP 70.910-900, Brasília, Distrito Federal, Brazil.

HETERODON NASICUS (Western Hognose Snake). MÉXICO: AGUASCALIENTES: municipality of Aguascalientes (21°57'N, 102°17'W) in grassland and dry forest. 1 November 1991. Gilfredo de la Riva. Universidad Autónoma de Aguascalientes, Centro Básico, Departamento de Biología (UAA-VR 00209). Verified by Carlos Balderas. First record for state of Aguscalientes; extends range ca. 160 km SE of Zacatecas, 210 km SW of San Luis Postosí (Platt 1969. Univ. Kansas Publ. Mus. Nat. Hist. 18:253–420) and 125 km NW of Jalisco (Pérez-Ramos 1987. Herpetol. Rev. 18:56).

Submitted by **JOEL VAZQUEZ-DIAZ** and **GUSTAVO QUINTERO-DIAZ**, Universidad Autónoma de Aguascalientes, Centro Básico, Departamento de Biología, Avenida Universidad 940, C.P. 20100, Aguascalientes, Aguascalientes, México, and **AURELIO RAMIREZ-BAUTISTA**, Instituto de Biología, Departamento de Zoología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, México, Distrito Federal 04510, México.

HYDROPS TRIANGULARIS. PARAGUAY: Departamento Presidente Hayes: Río Paraguay ca. 14 km by river S from Puerto Rosario, 24°32'22"S, 57°10'15"W. 26 January 1995. E. Buongermini P., T. Waller, and P. Micucci. Museo de Historia Natural del Paraguay (MNHNP 06462). Verified by Marta Motte. First record for the Paraguayan basin. A male collected while crossing the river.

Submitted by **EMILIO BUONGERMINI P.**, Museo Nacional de Historia Natural del Paraguay, Sección de Herpetología, Caballero 1060, Asunción, Paraguay, CP 1324, and **TOMAS WALLER**, Zavalía 2090 3°B, Buenos Aires, Argentina, 1428.

LAMPROPELTIS CALLIGASTER RHOMBOMACULATA (Mole Kingsnake). USA: FLORIDA: Calhoun Co: near Blountstown. May 1996. C. J. Longden. Florida Museum of Natural History, University of Florida (UF Color Slide 111098). Verified by David Auth. New county record (Ashton and Ashton 1988. Handbook of Reptiles and Amphibians of Florida. Part One. The Snakes. Second Ed. Windward Publ., Miami, Florida. 176 pp.). Offspring from gravid female collected from wild. Laid 4 eggs 17 June; 3 eggs hatched 20 August 1996.

Submitted by **KENNETH L. KRYSKO**, Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida 32611, USA.

LAMPROPELTIS GETULA (Common Kingsnake) USA: COLORADO: Bent Co: DOR, Co. Rd. 24, 0.1 mi S jct Rt. 50. 16 August 1997. Verified by Hobart M. Smith and David Chiszar. University of Northern Colorado Museum of Natural History (UNC-MNH 765). County record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.). An additional specimen (UNC-MNH 611 from Otero County found DOR on Co. Rt. 109, 0.1 mi N jct Co. Rd. Y; 37°55.416'N, 103°32.403'W on 2 June 1997) was also recovered, confirming the natural presence of this species in Otero County. All specimens taken in eastern Colorado have been found south of the Arkansas River drainage. Specimen is intermediate between the races *holbrooki* and *splendida*.

Submitted by **ENOCH BERGMAN, CHAD MONTGOMERY, THERESA CHILDERS, JERRY D. MANZER, JAMES SIFERT, BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

LAMPROPELTIS GETULA (Common Kingsnake). USA: FLORIDA: Franklin Co: St. Vincent Island. An adult male collected on "Christman's Road" between roads 4 & 5. 18 May 1983. Steven P. Christman. UF 57740. Verified by David L. Auth. Another adult male was found on 12 April 1987 at the Picalene Indian midden (archaeological site 8FR365) on the Apalachicola Bay side of St. Vincent Island in NE 1/4 SE1/4 Sec. 20, T9S, R9W by D. Bruce Means, and was also verified by David L. Auth. Four 35 mm slides of this second specimen were catalogued together as UF 111442. First published records of species on any of the eastern Gulf Coast barrier islands of Apalachee Bay (Blaney 1971. Herpetologica 27:406–430).

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

LAMPROPELTIS GETULA GETULA (Eastern Kingsnake). USA: FLORIDA: Bay Co: SR 22, ca. 17 mi W Wewahitchka. May 1997. C. J. Longden. Florida Museum of Natural History, University of Florida (UF Color Slide 109826). Verified by David Auth. New county record (Ashton and Ashton 1988. Handbook of Reptiles and Amphibians of Florida. Part One. The Snakes. Second Ed. Windward Publ., Miami, Florida. 176 pp.).

Submitted by **KENNETH L. KRYSKO**, Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida 32611, USA, e-mail: kenneyk@grove.ufl.edu, and **LEONARD E. KRYSKO**, 7575 128 Street North, Seminole, Florida 34646, USA.

LAMPROPELTIS GETULA SPLENDIDA (Desert Kingsnake). USA: NEW MEXICO: Lincoln: DOR U.S. Rt. 54 at Mile Marker 106, 46.7 km N Tularosa, ESE 1/4 Sec 36, T9S, R8. 27 August 1997. Doug Burkett. University of New Mexico Museum of Southwestern Biology (MSB 61000). Verified by D. S. Sias. New county record (Degenhardt et al. 1996. Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. xix + 431 pp.).

Submitted by **DOUG BURKETT**, P.O. Box 399, White Sands Missle Range, New Mexico 88002, USA, and **CHARLES W. PAINTER**, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico 87504, USA.

LAMPROPELTIS TRIANGULUM (Milk Snake). USA: ARIZONA: Coconino Co: Aubrey Valley: 35°30'01"N, 113°07'35"W. 5 June 1997. Betsy Dunkirk. ASU 30876. Verified by Jeff Howland. Specimen found dead in two pieces next to Arizona Game and Fish Department Black-Footed Ferret (*Mustela nigriceps*) acclimation pen no. 6. First specimen from the Aubrey Valley; extends range ca. 90 km west from the nearest documented specimen in Coconino County (Jeff Howland, pers. comm.; George Bradley, pers. comm.). Supports previous observations of *L. triangulum* in this valley. Kim Kime reported (Arizona Game and Fish Department, Heritage Data Management System) seeing a ca. 60 cm long specimen near this locality on 21 July 1994 at 0345 h while spotlighting for Black-Footed Ferrets. Steve Campbell reports capturing a female specimen in the Aubrey Valley near the town of Seligman (Yavaipai County: SW 1/4 of NE 1/4 Section 4, T23N, R7W) on 11 July 1992, although this speci-

men has not yet been deposited in an institutional collection nor reported in the literature.

Submitted by **ANDREW T. HOLYCROSS**, Zoology Department, Arizona State University, Tempe, Arizona 85287-1501, USA, and **ROB SIMONSON**, Arizona Game and Fish Department, Nongame Branch, 2221 West Greenway Road, Phoenix, Arizona 85023-4312, USA.

LAMPROPELTIS TRIANGULUM (Milk Snake). USA: TEXAS: IRION CO: Barnhart. 22 May 1997. Jeff Wright. Angelo State Natural History Collections (ASNHC 12909). Verified by Terry C. Maxwell. New county record (Dixon 1987. Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.). Apparent intergrade between *L. t. annulata* and *L. t. celaenops*. The status of *L. triangulum* in this area of Texas is uncertain and deserves further investigation. The only known specimens that exist from this area are UTA 38339 from 8 km S of Barnhart in Crockett County and ANSP 26588 from San Angelo in Tom Green County. TNHC 7134 from Texon in Reagan County was collected in 1949 but reported lost in 1962. It is assumed that this snake was identified properly. Institutional acronyms follow Leviton et al. 1985 (Copeia 1985:802–832).

Submitted by **JERRY F. HUSAK**, Department of Biology, Angelo State University, San Angelo, Texas 76909, USA, and **JEFF WRIGHT**, 11633 Hawk Avenue, San Angelo, Texas 76904, USA.

LAMPROPELTIS TRIANGULUM GENTILIS (Plains Milk Snake) USA: COLORADO: CROWLEY CO: DOR, Rt. 96 2.9 mi W jct Co. Rd. 27 (38°14.499'N, 103°37.645'W). 2 June 1997. Verified by Hobart M. Smith and David Chiszar. University of Northern Colorado Museum of Natural History (UNC-MNH 582). County record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **ENOCH BERGMAN, CHAD MONTGOMERY, THERESA CHILDERS, JERRY D. MANZER, JAMES SIFERT, BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

LAMPROPELTIS TRIANGULUM GENTILIS (Plains Milk Snake) USA: COLORADO: BACA CO: AOR, NW corner Co. Rd. 45 and Co. Rd. 6 (37°04' 37.96"N, 102°16' 25.19"W). 11 May 1997. Adult pair found beneath tin. University of Northern Colorado Museum of Natural History (UNC-MNH Photograph 25). Southern range extension of ca. 25 miles (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.); LAS ANIMAS CO: live under log on side of Co. Rd. 18.2, 1.0 mi S jct Co. Rd. 193.7 (37°07.181'N, 103°17.975'W). 24 September 1997. UNC-MNH Photograph 26. Southern range extension of ca. 60 miles and a northern extension from New Mexico populations of ca. 50 miles (Livo et al. 1996, *op. cit.*). Both verified by Hobart M. Smith and David Chiszar.

Submitted by **CHAD MONTGOMERY, THERESA CHILDERS, ENOCH BERGMAN, JERRY D. MANZER, JAMES SIFERT, BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

LIOTYPHLOPS TERNETZII. ARGENTINA: ENTRE RIOS: Department Colón: Parque Nacional El Palmar (Ubajay), 31°47'S, 58°18'W. 25 October 1984. Herpetological collection of Museo Argentino de Ciencias Naturales "Bernardino Rivadavia," Buenos Aires, Argentina (MACN 32922). Verified by G. Scrocchi. First province record for the genus (Vuoto 1995. Mem. Mus. Cs. nats. y antropol. Prof. A. Serrano, Serie Nueva Zool. N° 5:17 pp., E. Ríos) extends known range ca. 600 km S from previously cited localities (Bergna and Alvarez 1992. Facena 9:106; Giraudo 1994. Cuad. Herpetol. 8[2]:229-231).

Submitted by **SONIA KRETZSCHMAR**, Instituto de Herpetología, Fundación Miguel Lillo, Miguel Lillo 251, 4000 San Miguel de Tucumán, Argentina; e-mail soniak@unt.edu.ar.

MASTICOPHIS FLAGELLUM (Coachwhip). USA: NEW MEXICO: LOS ALAMOS CO: Los Alamos National Laboratory, 0.8 km W White Rock, 396510mN, 388610mE. 17 July 1997. Esther I. Nelson. University of New Mexico Museum of Southwestern Biology (MSB 61001). Verified by D. S. Sias. New county record (Degenhardt et al. 1996. Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. xix + 431 pp.).

Submitted by **ESTHER I. NELSON**, Los Alamos National Laboratory, P.O. Box 1663, M887, Los Alamos, New Mexico 87545, USA, and **CHARLES W. PAINTER**, New Mexico Department of Game and Fish, P.O. Box 25112, Santa Fe, New Mexico, 87504, USA.

MASTICOPHIS FLAGELLUM FLAGELLUM (Eastern Coachwhip). USA: KENTUCKY: PULASKI CO: Pulaski, 14 mi S [of Eubank] [DOR] on [Rt.] 27. 6 June 1948. Collector unknown. UMMZ 221630. Verified by Arnold G. Kluge. County record; third record for the state (Collins and Hirschfeld 1971. J. Herpetol. 5:193) and first record for eastern Kentucky (Conant and Collins 1991. Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Third Ed. Houghton Mifflin Co., Boston, Massachusetts. xviii + 450 pp.). Specimen was found in the personal collection of the late William Simpson of Detroit. The locality information in brackets was interpreted from a water and mildew damaged jar label. Specimen may have been collected by Jack Cody whose name was associated with some other specimens from Kentucky in the Simpson Collection. Specimen is a female, light phase with black pigment on the head and neck, SVL 1468 mm, with 205 ventral scales.

Submitted by **GREGORY E. SCHNEIDER**, Division of Reptiles and Amphibians, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 48109-1079, USA.

MASTICOPHIS LATERALIS (Striped Racer). USA: CALIFORNIA: MENDOCINO CO: Rt. 162, 21.25 km NE (by road) of Rt. 101, rocky slope on the E side of the main stream of the Eel River. 11 October 1992. J. V. Vindum. CAS 186406; Rt. 162, 28.69 km NE (by road) of Rt. 101, rocky slope on the N side of Middle Fork Eel River. 3 September 1994. J. V. Vindum. CAS 196344. Both verified by R. C. Drewes. Second and third records from Mendocino County and first records from the Eel River drainage. Extends the range ca. 42 km N of MVZ 97839 (California: Mendocino Co: 16 km S of Willits), ca. 120 km S of westernmost Trinity County record (Lind 1992. Herpetol. Rev. 23:124), and ca. 65 km WSW of MVZ 193333 (California: Tehama Co: Round Valley Road, ca 0.4 km N Salt Creek Saddle). These new records occur W of the North Coast Range crest, which was thought to be a geographic barrier to the westward dispersal of the species in northern California (Bury 1970. J. Herpetol. 4:165–178).

Submitted by **JENS V. VINDUM**, Department of Herpetology, California Academy of Sciences, Golden Gate Park, San Francisco, California 94118-4599, USA.

NERODIA SIPEDON PLEURALIS (Midland Water Snake). USA: MISSOURI: PERRY CO: 12.9 km E Perryville (37°45'46"N, 89°42'59"W). 15 October 1994. B. Churchwell, J. Krejca, and S. Taylor. SIUC R-2807. Verified by R. A. Brandon. Dead on paved road near pond, farm fields, and woodlots. County record; not previously reported in Missouri counties bordering the Mississippi River south of Ste. Genevieve County (Johnson 1987. The Amphibians and Reptiles of Missouri. Publ. Missouri Dept. Conserv., Jefferson City. 368 pp; Powell et al. 1993. Missouri Herpetol. Assoc. Newsl. 6:7–26).

Submitted by **STEVEN J. TAYLOR**, Center for Biodiversity, Illinois Natural History Survey, 607 East Peabody Drive, Champaign, Illinois 61820, USA, **JEAN K. KREJCA**, Department of Zoology, University of Texas, Austin, Texas 78712-1064, USA, and **BETH CHURCHWELL**, The Nature Conservancy, 2800 South Brentwood Boulevard, St. Louis, Missouri 63144, USA.

OXYBELIS AENEUS (Mexican Vine Snake). MÉXICO: AGUASCALIENTES: "EL TEPOZAN," municipality of Calvillo (21°58'N, 102°45'W) in subtropical dry forest. 11 August 1982. Gilfredo de la Riva. Universidad Autónoma de Aguascalientes, Centro Básico, Departamento de Biología (UAA-VR 00094). Verified by Mario Mancilla. First record for Aguascalientes; extends range ca. 75 km NE Zacatecas (Keiser 1974. Bull. Texas Mem. Mus. 22:479–485), and 350 km NW Queretaro (Dixon et al. 1972. Southwest. Nat. 16:225–237).

Submitted by **JOEL VAZQUEZ-DIAZ** and **GUSTAVO QUINTERO-DIAZ**, Universidad Autónoma de Aguascalientes. Centro Básico, Departamento de Biología. Av. Universidad 940, C.P. 20100, Aguascalientes, Aguascalientes, México, and **AURELIO RAMIREZ-BAUTISTA**, Instituto de Biología, Departamento de Zoología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, México, Distrito Federal 04510, México.

PITUOPHIS CATENIFER SAYI (Bullsnake). USA: MINNESOTA: CARLTON CO: Split Rock Twp., 15 km W Moose Lake (SW 1/4 SW 1/4 Sec. 24, T46N, R21W). 12 September 1996. Leonard and Sandra Pasek. JFBM 13512. Verified by James Underhill. County record (Oldfield and Moriarty 1994. Amphibians and Reptiles Native to Minnesota. Univ. Minnesota Press, Minneapolis. 237 pp.) This extends the range ca. 100 km north.

Submitted by **JOHN J. MORIARTY**, Hennepin Parks, 3800 County Road 24, Maple Plain, Minnesota 55359, USA.

PSEUSTES POECILONOTUS POLYLEPIS. VENEZUELA: ESTADO ARAGUA: Municipio Girardot, La Pedrera, Tucupido. Parque Nacional Henri Pittier, 10°16'N, 67°31'W, 600 m elev. 1997. C. Linares. Museo del Servicio AutÛnomo PROFAUNA, Ministerio del Ambiente y de los Recursos Naturales Renovables, Maracay (EBRG 3340). Verified by R. Rivero. First record for state of Aragua and the Parque Nacional Henri Pittier, filling gaps between the state of Carabobo and the Distrito Federal (Manzanilla et al. 1996. Acta Cient. Venezuela 47[3]:1–12).

Submitted by **KAREL LEMOINE** Instituto de ZoologÌa Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Venezuela, **GILSON RIVAS**, Museo de Historia Natural La Salle, Caracas, Venezuela, and **JESÚS MANZANILLA**, Museo del Instituto de Zoología Agrícola, Facultad de Agronomía,Universidad Central de Venezuela, Maracay, Venezuela.

RAMPHOTYPHLOPS BRAMINUS (Brahminy Blind Snake). USA: FLORIDA: SEMINOLE CO: Casselberry, ca. 3 km E jct Florida Rt. 436 and Oxford Road under a brick in backyard of residential home at 1516 East Boulevard. 27 March 1998. Douglas T. Bowman, Jr. and Richard D. Owen. Deposited in the Florida Museum of Natural History collection (UF112961). Verified by F. Wayne King and David Auth. First documented occurrence of species in county. Populations of this snake exist at numerous locations in southern Florida and they appear to have been established there via the exotic plant trade (Conant and Collins 1991. Peterson Field guide to Reptiles and Amphibians of Eastern and Central North America. 3rd ed. Houghton Mifflin Co., Boston, Massachusetts. 450 pp.; Wilson and Porras 1983. The Ecological Impact of Man on the South Florida Herpetofauna. Univ. Kansas Mus. Nat. Hist. Spec. Publ. 9:1–89). Considering the widespread use of exotic plants in the Florida landscape, as well as the parthenogenic reproductive mode of the snake, we suggest that this observation be considered a range extension of the species. In the near future additional observations of the Brahminy Blind Snake will likely be made in the area between central and south Florida, and possibly in northern Florida as well.

Submitted by **RICHARD D. OWEN**, Florida Museum of Natural History, University of Florida, Gainesville, Florida 36611, USA, **DOUGLAS T. BOWMAN, JR.**, 1217 Needlewood Loop, Oviedo, Florida 32765, USA, and **STEVE A. JOHNSON**, Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida 32611, USA.

REGINA SEPTEMVITTATA (Queen Snake). USA: VIRGINIA: WYTHE CO: Patterson, Little Reed Island Creek. 27 June 1977. L. M. Page, M. A. Morris, and R. L. Mayden. INHS 10423. Verified by P. W. Smith. New county record (Mitchell 1994. The Reptiles of Virginia. Smithsonian Inst. Press, Washington, D.C. 352 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

RHADINAEA FULVICEPS. VENEZUELA: ESTADO ZULIA: Perija, Palmar River Basin, Las Lajas River. 10°23'N, 72°35'W, 700 m elev. May 1991. Profauna Zulia (sic). Museo de la Estación Biológica de Rancho Grande, Profauna, Maracay (EBRG 2555). Verified by K. Lemoine. Specimen constitutes first record for the state of Zulia and Venezuela (Myers 1974. Bull Amer. Mus. Nat. Hist. 157:1–262; Lancini and Kornacker 1989. Verlag Armitano Ed. Caracas, Venezuela, p. 381) and the easternmost locality; extends known range ca. 560 km NE of Colombia (Perez-Santos and Moreno 1988. Mus. Reg. Sci. Nat. Torino. Monografía IV, p. 132).

Submitted by **JESÚS MANZANILLA**, Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Apartado 4579, Maracay 2101-A, Venezuela, **ABRAHAM MIJARES-URRUTIA**, Centro de Investigaciones de Ecología y Zonas Aridas (CIEZA), Universidad Francisco de Miranda, Apartado 7506, Coro 4101-A, Venezuela, and **RAMÓN RIVERO**, Instituto Autónomo Profauna, Ministerio del Ambiente y de los Recursos Naturales Renovables, Maracay, Venezuela.

RHINOCHEILUS LECONTEI TESSELLATUS (Longnose Snake) USA: COLORADO: Prowers Co: DOR, Co. Rd. B.5, 2.1 mi W jct Co. Rd. 11 (37°39.928'N, 102°36.263'W). 23 June 1997. Verified by Hobart M. Smith and David Chiszar. University of Northern Colorado Museum of Natural History (UNC-MNH 854). Range extension; closest known localities are ca. 25 miles north and 25 miles south (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **CHAD MONTGOMERY, THERESA CHILDERS, ENOCH BERGMAN, JERRY D. MANZER, JAMES SIFERT, BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

SALVADORA GRAHAMIAE LINEATA (Texas Patchnose Snake). USA TEXAS: Tom Green Co: FM 1223, 35.6 km S jct U.S. Rt. 87 and FM 1223. 7 November 1997. Jeff Wright. Angelo State Natural History Collections (ASNHC 12910). Verified by Terry C. Maxwell. New county record (Dixon 1987. Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.).

Submitted by **JERRY F. HUSAK**, Department of Biology, Angelo State University, San Angelo, Texas 76909, USA, and **JEFF WRIGHT**, 11633 Hawk Avenue, San Angelo, Texas 76904, USA.

SISTRURUS CATENATUS EDWARDSII (Desert Massasauga) USA: COLORADO: Baca Co: DOR, Co. Rd. 12, 1.2 mi S jct Co. Rd. JJ (37°26'17.60"N, 102°51'24.25" W). 10 May 1997. University of Northern Colorado Museum of Natural History (UNC-MNH 516). Verified by Hobart M. Smith and David Chiszar. Three additional specimens (AOR, Co. Rd. RR, 0.2 mi E jct, Co. Rd. 12, 13 August 1997; DOR, Co. Rd. 12, 2.4 mi N jct, Co. Rd. MM, 10 September 1997, UNC-MNH 801; AOR, Co. Rd. 12, 2.7 mi S jct Co. Rd. MM, 7 October 1997) were recovered in the same general area, indicating that a small population of Massasaugas still exists in Baca County; these localities represent a range extension of ca. 30 miles. Species is threatened by habitat conversion and persecution in much of its range; the last record of this species from Baca County was in 1882 (see Mackessy et al. 1996. Herpetol. Rev. 27:36). This record is a recent county record (Livo et al. 1996. Herpetological Microbiogeography of Colorado II: Documented and Potential County Records. Publ. Colorado Herpetol. Soc.).

Submitted by **CHAD MONTGOMERY, THERESA CHILDERS, ENOCH BERGMAN, JERRY D. MANZER, JAMES SIFERT, BEN HILL,** and **STEPHEN P. MACKESSY**, Department of Biological Sciences, University of Northern Colorado, Greeley, Colorado 80639, USA.

STORERIA DEKAYI (Brown Snake). USA: ILLINOIS: Clay Co: E of La Clede. 4 May 1969. D. Cooley. INHS 9825. Verified by P. W. Smith. New county record.

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

STORERIA DEKAYI WRIGHTORUM (Midland Brown Snake). USA: FLORIDA: Franklin Co: SR 65, ca. 4.0 mi N U.S. Rt. 98 just N of Cash Bayou. 30 March 1997. Kenneth L. Krysko and Anthony T. Reppas. Florida Museum of Natural History, University of Florida (UF Color Slide 109633). Verified by F. Wayne King. New county record (Ashton and Ashton 1988. Handbook of Reptiles and Amphibians of Florida. Part One. The Snakes. Second Ed. Windward Publ., Miami, Florida. 176 pp.). Gravid female.

Submitted by **KENNETH L. KRYSKO**, Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, Florida 32611, USA; e-mail: kenneyk@grove.ufl.edu, and **ANTHONY T. REPPAS**, Department of Interdisciplinary Studies, University of Florida, Gainesville, Florida 32611, USA.

STORERIA OCCIPITOMACULATA (Redbelly Snake). USA: KANSAS: Crawford Co: Center of SW 1/4 Sec. 32, T27S, R24E. 7 October 1997. Dan Mosier. KU 224646. Verified by John E. Simmons. New county record (Collins 1993. Amphibians and Reptiles in Kansas. Third Ed. Univ. Press Kansas, Lawrence. xx + 397 pp.) for this threatened species in Kansas.

Submitted by **DAN MOSIER**, Kansas Department of Wildlife and Parks, 102 Hatchery Road, Farlington, Kansas 66734, USA, and **JOSEPH T. COLLINS**, The Center for North American Amphibians and Reptiles, 1502 Medinah Circle, Lawrence, Kansas 66047, USA.

TANTILLA CORONATA (Southeastern Crowned Snake). USA: ALABAMA: Dale Co: Fort Rucker Military Reservation. 4 July 1974. M. A. Morris. INHS 10163. Verified by P. W. Smith. New county record (Mount 1975. The Reptiles and Amphibians of Alabama. Auburn Univ. Agric. Exp. Sta., Auburn, Alabama. 347 pp.).

Submitted by **JOHN E. PETZING** and **CHRISTOPHER A. PHILLIPS**, Illinois Natural History Survey, Center for Biodiversity, 172 Natural Resources Building, 607 East Peabody Drive, Champaign, Illinois 61820, USA.

THAMNOPHIS SIRTALIS SIRTALIS (Eastern Garter Snake). USA: MISSOURI: Perry co: 16 km E Perryville (37°43'07"N, 89°40'42"W) and (37°42'41"N, 89°40'45"W). 16 October 1994, B. Churchwell, J. Krejca, and S. Taylor. SIUC R-2806 and SIUC R-2805, respectively. Verified by R. A. Brandon. Each specimen found dead on a dirt road near farm fields and woodlots. County record (Johnson 1987. The Amphibians and Reptiles of Missouri. Publ. Missouri Dept. Conserv., Jefferson City. 368 pp; Powell et al. 1993, Missouri Herpetol. Assoc. Newsl. 6:7–26).

Submitted by **STEVEN J. TAYLOR**, Center for Biodiversity, Illinois Natural History Survey, 607 East Peabody Drive, Champaign, Illinois 61820, USA, **JEAN K. KREJCA**, Department of Zoology, University of Texas, Austin, Texas 78712-1064, USA, and **BETH CHURCHWELL**, The Nature Conservancy, 2800 South Brentwood Boulevard, St. Louis, Missouri 63144, USA.

Range Extensions of Some Anuran Species for Santa Catarina and Rio Grande do Sul States, Brazil

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Examination of anuran specimens deposited in Coleção de Anfíbios do Museu de Ciências Naturais (MCN), of the Fundação Zoobotânica do Rio Grande do Sul, along with new material obtained in recent collections, deposited in Coleção de Répteis e Anfíbios of the Departamento de Zoologia da Universidade Federal do Rio Grande do Sul (UFRGS-DZ) and Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul (MCP), revealed nine previously unrecorded species from the State of Rio Grande do Sul. It also allowed us to extend known ranges of three species for the state of Santa Catarina. Additionally, we correct the erroneous record of *Thoropa miliaris* for Rio Grande do Sul. Identifications were verified by José Perez Pombal, Jr., and Ulisses Caramaschi.

HYLIDAE

Hyla albopunctata. SANTA CATARINA: Canoinhas Municipality (26°10'38"S, 50°23'24"W, 834 m). 20 December 1994. P. C. A. Garcia. MCP 3114–17. RIO GRANDE DO SUL: Santo Antônio das Missões Municipality (28°30'41"S, 55°13'40"W, 213 m). 17 January 1977. T. O. Bocaccio. MCN 11706. There was no previous documented record for *H. albopunctata* in Rio Grande do Sul, even though de Sá (1995) provided a distribution map for the species which included northern Rio Grande do Sul.

Hyla caingua. RIO GRANDE DO SUL: Cruz Alta Municipality (28°38'19"S, 53°36'23"W, 452 m). 4 November 1975. T. Lema, A. Lise and S. Scherer. MCN 8883–84, 8886; Santo Antônio das Missões Municipality (28°30'41"S, 55°13'40"W, 213 m). 3 October 1989. P. C. Braun. MCN 13362; Panambi Municipality: Condor (28°17'33"S, 53°30'06"W, 418 m). 30 July 1997. G. Vinciprova. UFRGS-DZ 1683. These records extend known range of the species ca. 220 km SE from Depto. de Playadito, Province de Corrientes, Argentina, as reported by Carrizo (1990).

Hyla hylax. SANTA CATARINA: Florianópolis Municipality: Córrego Grande (27°37'00"S, 48°30'00"W, 100 m). 11 September 1990. P. C. A. Garcia. MCP 3122. 12 December 1990. P. C. A. Garcia. MCN 13430–1. 18 September 1991. P. C. A. Garcia. MCP 3120. 11 September 1992. P. C. A. Garcia. MCP 3121. These records extend the known range of the species ca. 240 km S from Paranaguá Municipality: Prainha, Paraná State, as reported by Heyer (1985b).

Hyla microps. RIO GRANDE DO SUL: Tenente Portela Municipality, Parque Estadual do Turvo (27°22'16"S, 54°54'01"W, 390 m). 24 June 1985. J. Pilla. MCN 1097, 1106, 1116. These records extend known range of the species ca. 200 km W from São Francisco de Paula Municipality, Rio Grande do Sul, as reported by Kwet (1998).

Hyla nahdereri. SANTA CATARINA: Campos Novos Municipality, Ibicuí River (27°34'30"S, 51°10'10"W, 934 m). 25–29 January 1989. T. Lema et al. MCP 892–5; Rancho Queimado Municipality (27°40'21"S, 49°01'18"W, 810 m). 11 October 1991. P. C. A. Garcia. MCN 13432–33. 11 October 1993. P. C. A. Garcia. MCP 3123–24. These records extend the known range of the species ca. 230 km SSW from the type locality (São Bento do Sul, Santa Catarina, Frost 1985), to which the species had been restricted.

Scinax rizibilis. SANTA CATARINA: Florianópolis Municipality, Córrego Grande (27°37'00"S, 48°30'00"W, 100 m). 27 January 1991. P. C. A. Garcia. MCN 13443–44, MCP 3134–37. RIO GRANDE DO SUL: Terra de Areia Municipality (29°35'07"S, 50°04'15"W, 14 m). 29 September 1995. G. Vinciprova. UFRGS-DZ 1678–82. These records extend known range of the species ca. 400 km S from Corupá, Santa Catarina, the type-locality of *H. mirim*, a junior synonym for *H. rizibilis* according to Andrade and Cardoso (1987).

Sphaenorhynchus surdus. SANTA CATARINA: Lontras Municipality (27°09'58"S, 49°32'31"W, 330 m). 21 February 1991. P. C. A. Garcia. MCP 1302–05. Lages Municipality (27°48'58"S, 50°19'34"W, 884 m). 19 December 1995. A. Cardoso, P. C. A. Garcia and G. Vinciprova. UFRGS-DZ 1626–27; Tubarão Municipality (28°28'00"S, 49°00'25"W, 9 m). 10 December 1986. T. Lema and M. Di Bernardo. MCN 1325. RIO GRANDE DO SUL: São Pedro de Alcântara Municipality: (29°20'07"S, 49°43'37"W, 16 m). 29 December 1977. P. C. Braun and C. A. S. Braun. MCN 11929–30, MCN 12028–31. These records extend known range of the species ca. 600 km SSW from the type locality (Curitiba Municipality, Paraná, Frost 1985).

Phyllomedusa distincta (Perereca-da-Folhagem). RIO GRANDE DO SUL: Terra de Areia Municipality (29°35'07"S, 50°04'15"W, 14 m). 15 December 1995. G. Vinciprova and A. J. Cardoso. UFRGS-DZ 1621. 25 september 1997. G. Vinciprova. UFRGS-DZ 1684. These records extend the known range of the species ca. 150 km S from Lauro Müller Municipality, Novo Horizonte, Santa Catarina, as reported by Pombal, Jr. and Haddad (1992:228).

CENTROLENIDAE

Hyalinobatrachium uranoscopum (Rã-de-Vidro). RIO GRANDE DO SUL: Planalto Municipality (27°19'44"S, 53°03'31"W, 568 m): Rio do Mel. 19 January 1994. G. Vinciprova. UFRGS-DZ 1392; Planalto Municipality: Rio do Mel. 20 January 1994; Planalto Municipality: Rio do Mel. G. Vinciprova. UFRGS-DZ 1456; Planalto Municipality. 23 January 1994. G. Vinciprova. UFRGS 1465–66. 14 March 1997. These records extend the known range of the species ca. 170 km SE of San Antonio Depto., Misiones Province, Argentina, and 350 km W from Lauro Müller Municipality, Santa Catarina, as reported by Heyer (1985a).

LEPTODACTYLIDAE

Leptodactylus chaquensis. RIO GRANDE DO SUL: Bossoroca Municipality (23°43'48"S, 54°54'01"W, 228 m). 7–11 January 1972. P. C. Braun and I. J. Borowski. MCN 4500–07. São Vicente do Sul Municipality (29°41'30"S, 54°40'46"W, 129 m). 30 November 1981. MCN 12790. M. I. Vieira. Uruguaiana Municipality (29°45'17"S, 57°05'18"W. 66 m). 8 November 1973. E. Huber. MCN 5484–91. Uruguaiana Municipality: Touro Passo. February 1974. Miguel Bombim. MCN 6745–46. These records extend the known range of the species ca. 100 km E from Misiones Province, Argentina (Cei 1987) and 170 km NE of Artigas Depto., Uruguay (Vaz-Ferreira et al. 1984).

Eleutherodactylus binotatus (Rã-da-Mata). RIO GRANDE DO SUL: São Pedro de Alcântara Municipality (29°20'07"S, 49°43'37"W, 16 m). 21 February 1966. T. Lema. MCN 4158. This records extends known range of the species ca. 200 km S from Florianópolis Municipality, Santa Catarina, as reported by Garcia (1996).

Cyclorhamphus valae. RIO GRANDE DO SUL: Cambará do Sul Municipality: Fortaleza dos Aparados (29°02'52"S, 50°08'41"W, 1031 m). 6 January 1976. P. C. Braun et. al. MCN 9956. This record extends known range of the species ca. 90 km SW from type-locality (Gruta, Lauro Müller Municipality) as reported by Heyer (1983).

Thoropa saxatilis (Rã-das-pedras). RIO GRANDE DO SUL: Cambará do Sul Municipality, Fortaleza dos Aparados (29°02'52"S, 50°00'41"W, 1031 m). 6 January 1976. P. C. Braun. MCN 9717–18; Cambará do Sul Municipality, Itaimbezinho. 21 December 1976. S. Scherer and A. Lise. MCN 11705; Cambará do Sul Municipality. 12 January 1978. P. C. Braun, C. A. S. Braun and J. Rodrigues. MCN 12250. The possibility of occurrence of *T. saxatilis* in Rio Grande do Sul was already mentioned by Cocroft and Heyer (1988), who argued that *T. miliaris* could have been misidentified by Braun and Braun (1980). We confirm that specimens mentioned by Braun and Braun in fact belong to *T. saxatilis*. *Thoropa miliaris* should be removed from the species list of anurans for Rio Grande do Sul.

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Herpetofauna of the Highly-polluted Onondaga Lake Ecosystem, Onondaga County, New York

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So much of the earth is now affected by human activities that greater investigative efforts will have to be directed toward disturbed habitats. Study of these newly formed "ecosystems" is necessary for understanding the dynamics of novel species assemblages as well as pollutant-organism interactions. Herein we report on the herpetofaunal populations in and around Onondaga Lake, considered among the most polluted lakes in North America (Effler and Hennigan 1996).

Onondaga Lake lies on the northwestern corner of the Syracuse urbanization area (population ca. 390,000), Onondaga County, central New York State, USA, and is surrounded by urban industrial and commercial sites and residential communities. The Onondaga Lake ecosystem was operationally defined as those aquatic, wetland, and terrestrial habitats in and around the lake up to a maximum of 250 m from the lake shorelines. Thus defined, the ecosystem is bounded on all sides by major highways and thoroughfares which are probably effective barriers to herpetofaunal terrestrial dispersals. Water enters the lake from six creeks and the Syracuse Metropolitan sewage treatment facility. Water leaving the lake enters the Seneca River of the Lake Ontario drainage system. The terrestrial habitats around the lake are largely parkland, old field, and deciduous forests over industrial waste beds, construction fill, or dredged lake sediment material (Effler and Hartnett 1996; VanDruff and Pike 1992). Several small wetlands, some connected to the lake, are scattered among the terrestrial areas.

The lake has a 150-year history of municipal and industrial pollution (Effler and Harnett 1996; Effler and Hennigan 1996).

TABLE 1. Amphibian and reptile species in the Onondaga Lake ecosystem, 1994–1997. * = less than three individuals found in four years of surveys. Catalog numbers are for voucher specimens or slides from Bowers Natural History Museum, SUNY Cortland.

Species	Life history stage	Voucher numbers
Bufo americanus	adult, calling males	96-101
Hyla chrysoscelis/H. versicolor	adult	96-110
Pseudacris crucifer	adult, juvenile	96-111
Rana clamitans	adult, larvae, juvenile	96-102
Rana pipiens	adult, larvae, juvenile	96-103
Ambystoma maculatum	adult, larvae	96-106
Notophthalmus viridescens	aquatic adult*	96-107
Nerodia sipedon	adult, gravid female	97S-11
Storeria dekayi	adult, neonate	96-104
Thamnophis sirtalis	adult, neonate	96-105
Chelydra serpentina	adult, egg	96-109
Chrysemys picta	adult, egg	96-108
Sternotherus odoratus	adult*	

Municipal sewage effluent and industrial discharge have been released into the lake since the mid-1800's (Effler and Hartnett 1996). By the late 1960s, 2.5×10^6 kg of ionic materials and 10 kg of mercury per day were being released into the lake by its single largest neighboring industry (Effler 1987). These releases were stopped by 1988, but the sewage and other industrial releases have continued. Today the lake's sediments and water column contain elevated levels of heavy metals (especially Hg), benzenes, chlorinated benzene compounds, polycyclic aromatic hydrocarbons, nitrites, and ammonia (Becker and Bigham 1995; Effler and Hennigan 1996; Normandeau Associates 1996; Wang and Driscoll 1995).

Studies of the vertebrates of the Onondaga Lake area have been limited, with the bulk of the work focused on gamefishes (Effler 1996; Tango and Ringler 1996; VanDruff and Pike 1992). There have been no previous surveys of the herpetofauna of this site.

We surveyed the lake ecosystem for herpetofauna from May 1994 through August 1997 using a combination of field techniques. We searched transects and quadrats throughout the ecosystem and used a form of time-constrained searching (termed select point sampling) in all terrestrial habitats over all seasons. For aquatic sampling we used dip-netting transects and trapping arrays using metal minnow traps and hoop turtle traps. Aquatic sampling was done in the lake and all other wetlands within the ecosystem. Auditory monitoring was conducted for all wetlands in the spring and summer of each year.

We found seven species of amphibians and six species of reptiles in the ecosystem (Table 1). This is considerably less than the nineteen amphibian species and fifteen reptile species recorded for Onondaga County as a whole during 1990–1996 (NYSDEC 1997). The species in the Onondaga Lake ecosystem are generally those most commonly reported across New York State (NYSDEC 1997) with a few notable exceptions. *Plethodon cinereus,* the most widely reported salamander in New York and usually the most abundant locally (PKD, pers. obs.), is absent from the terrestrial habitats surrounding the lake. The second most widely reported salamander in New York, *Notophthalmus viridescens,* although often in dense populations in farm ponds and disturbed areas, was extremely rare in the wetlands near Onondaga Lake. *Rana catesbeiana, R. sylvatica, Eurycea bislineata, Lampropeltis triangulum,* and *Storeria occipitomaculata* are widely distributed and locally abundant in central New York, and are generally tolerant of disturbed habitats, but were not found within this ecosystem.

Voucher specimens and/or slides for each species except *Sternotherus odoratus* are deposited in Bowers Natural History Museum of SUNY Cortland.

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BOOK REVIEWS

Snakes: The Evolution of Mystery in Nature, by Harry W. Greene. 1997. University of California Press. 351 pp. Hardcover. US $45.00. ISBN 0-520-200014-4.

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This is a great time to be studying snakes. In addition to increasing recognition that snakes make good "model organisms" for many kinds of ecological and evolutionary studies, snakes are receiving long-overdue attention in the form of detailed book-length reviews and monographs. Although many current graduate students may not realize it, this is a major change from the not-too-distant past. When we first began working with snakes in 1979, the major review works available as an introduction to snake biology were Parker and Grandison's *Snakes: A Natural History*, Wright and Wright's *Handbook of Snakes*, and, of course, Klauber's epic two-volume *Rattlesnakes*. Although these were (and are) great books, they were either too limited in scope or too out-of-date to be of much use for graduate students looking to get "jump started" on snake ecology and evolution.

Things have really changed today. In addition to a number of recent edited or multi-authored volumes on snake ecology, evolution, and behavior (mainly targeted at professionals), we now have two terrific single-author volumes intended for a broader audience: Rick Shine's *Australian Snakes: A Natural History* (1991), and Harry Greene's *Snakes: The Evolution of Mystery in Nature* (1997), the subject of this review.

Greene's book is an oversized, 351-page volume that attempts to appeal to a wide audience, from the professional to the interested layperson. The book is divided into three major sections. Part One: Lifestyles, is a 153-page overview of snake biology and evolution, with material that will interest the biologist and the sophisticated layperson alike. Part Two: Diversity, is a 110-page family by family review of snake diversity and taxonomy. Much of the text is fascinating for snake biologists, but may be of limited interest to the general public. Part Three: Synthesis, is the shortest section of the book, and comprises a 40-page discussion of snake evolution, biogeography, a brief biography of some past workers on snake biology, and a short overview of snake conservation and management. We do wish the last section had been longer, especially in convincing the public for the need for appropriate protection for snake biodiversity. Interspersed among these sections are 13 short essays on "Special Topics," which range from "Deadly Colubrids and Famous Herpetologists" to "The Coralsnake Mimicry Problem." These short essays were generally very entertaining and most will be highly interesting to the layperson.

The utility of any book can be judged on three criteria: the quality of the information presented, the quality of the writing, and the quality of the presentation. We judged this book on two levels: one from the view of the professional herpetologist, the other from the viewpoint of a non-specialist educator who happens to enjoy snakes. From both of our viewpoints, this book rates as "outstanding" in all three of the above criteria. Greene's writing style ranges from warm anecdotes regarding snake studies in the field (our favorite being his detailed account on how to **try** to catch a coachwhip), to concise summaries about what we know (and don't know) about snake biology. We were especially impressed by the clear and entertaining visualization of how snakes manage to eat very large prey on pp. 55 and 59. The only area that we felt was weak was the introduction to phylogeny and taxonomy on pp. 13–17, which one of us (NAS) felt was rather confusing for non-biologists.

The information content of this book is top-notch, and will prove an essential reference for herpetologists and other biologists interested in snakes. Even those actively engaged in research on snakes will find highly useful reviews of snake phylogeny, evolution, feeding, and behavior. If you are a graduate student in herpetology, you should run, not walk, to your nearest computer and order this book from the appropriate electronic bookstore. (We found a 30% discount on one Web site we checked.)

No review of this book could be complete without mentioning the photographs. Executed by Michael and Patricia Fogden, they are nothing less than stunning. Although this is far from a "coffee-table" book, you could easily leave this book out for your dinner guests for their delight and edification. If you can repeat some of Greene's stories about the behavior of some of the many rare and unusual species illustrated in the text, your reputation as a naturalist is bound to be inflated among your friends and family.

Criticisms are an expected part of a book review, but we were hard-pressed to find many substantive ones. The book seems well constructed, the text is legible (although a bit small), the index and table of contents both work well, and the price is terrific (especially for a book with so many color plates). Several minor points should be mentioned. First, we wished that the references had been in the text, rather than summarized in the back of the book. Although this may make the text slightly more accessible for the general public, it reduces the book's utility for the professional community by a small degree. The references were, however, extensive and complete. Second, the absence of a glossary was a notable flaw, especially in a book targeted at least partially for the non-specialist. Although some complex systematic terms are defined in an appendix, a concise list of biological terms seems essential in a book such as this. Perhaps this could be corrected in a revised edition. Third, the book was somewhat lacking in diagrams and line drawings; the same section on feeding that we praised above was also a bit confusing when Greene discusses skeletal systems; a line drawing would have helped a lot.

Comparisons between Greene's book and Rick Shine's text on the natural history of Australian snakes are perhaps inevitable. Both are superb products from two of the outstanding snake biologists of their time and appeal to much the same audience. However, choosing between the two is fruitless; both should be on the bookshelf of anyone interested in snakes. Perhaps the most striking contrast between the two texts concerns their respective attitudes towards venomous snakes. On p. 215 of Greene's book he states that "big elapids are among the scariest of animals." We agree wholeheartedly, but our conversations with Shine suggest that he would concur only if you replaced the word "elapids" with "rattlesnakes"!

In summary, this is a great book, and will stand as a long-lasting tribute to Harry Greene's broad accomplishments in herpetology. You will want a copy on your bookshelf, a copy for your graduate students, and we suspect you will find it an invaluable reference for lecture classes as well.

Herpetology, by F. Harvey Pough, Robin M. Andrews, John E. Cadle, Martha L. Crump, Alan H. Savitzky, and Kentwood D. Wells. 1998. Prentice Hall, Upper Saddle River, New Jersey. 577 pp. Hardcover. US $72.00. ISBN 0-13-850876-3.

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Despite what we would like to think, herpetology as an academic discipline is still a small field. Unlike general biology, genetics, biochemistry, or introductory ecology, the demand for textbooks is limited and the market is unlikely to support a diversity of competing titles. Until this year the only available herpetological textbook in English has been that by Zug (1993), which in turn replaced earlier texts by Goin, Goin, and Zug (1978), Porter (1972), and Goin and Goin (1962). It is certainly true that a larger, more well-illustrated, up-to-date herpetology text was sorely needed, and *Herpetology* does fit the bill. Nonetheless, I have a very mixed reaction to this contribution from Pough and colleagues. The book achieves its major aims, and will be used by herpetology classes around the country, but it is rife with errors and lacks the tight editorial supervision demanded by a book with six authors. The errors themselves would be excusable if they were errors of omission (after all, we each have our own views about what topics and examples are essential), but many of the errors in this text are errors of commission and, as such, they provide misinformation to novice readers (i.e., students).

Herpetology is organized into four sections: "What are amphibians and reptiles?", "How do they work?", "What do they do?", and "What are their prospects for survival?" The first section deals mainly with the basic anatomy, systematics, evolution, diversity, and distribution of amphibians and reptiles. It also includes an introductory chapter on herpetology as a discipline. The second section treats physiology, reproduction, and functional morphology. The third section covers behavior and ecology, and the fourth contains only a single chapter dealing with conservation, a topic that must be addressed in any modern herpetology course. Each chapter concludes with a summary. These are highly variable in level of detail, with some providing useful overviews and others being too sketchy to really serve a function. Overall, the authors present a fairly comprehensive overview of herpetology and I was not struck by many glaring omissions of topics or concepts (but see below). However, the interests of at least some of the authors are reflected in the depth of coverage of certain fields and in the apparent non-random distribution of errors, typos, and editing rigor. There are also a few quirks in the organization of material within the book. For example, there are two sections dealing with the structure and function of pit organs. Oddly, the longer section is not listed under "Pit organs" (p. 303), but rather on p. 111 under the sensory systems subsection in the general section on snakes. Perhaps most confusing, a section on "Pets and Zoo Exhibits" in the last chapter says nothing about zoo exhibits.

My own interests in systematics, biogeography, and morphology perhaps make me more acutely aware of errors in the first section of the book than in others, and perhaps I am being too picky, but I noted more than 100 factual errors (each relatively small) in this section of the book. The remainder of the book was less striking in this regard, although typographical errors, the use of outdated names and other evidences of editorial slack, are liberally sprinkled throughout the text. I am especially troubled by those errors relating to taxonomy and distribution. While such trifles may be regarded as of minor concern with respect to broad conceptual issues, they are among the many bits of factual information that we require our students to know and which distinguish amphibian systematists and reptile ecologists from those asking purely theoretical questions in the same conceptual disciplines.

Some of the difficulties with taxon names can be attributed to simple typographical errors (e.g., *Ichtyophis* for *Ichthyophis*, p. 47; *Rhotropus* for *Rhoptropus*, p. 98; *Basiliscus basilicus* for *B. basiliscus*, p. 395). Others reflect the use of outdated names (e.g., *Gerrhonotus multicarinatus* is used instead of *Elgaria multicarinata* in a figure caption, p. 104; *Heteropholis* is used instead of *Naultinus* for the South Island, New Zealand green geckos, p. 98; *Amphibolurus ornatus* is used rather than *Ctenophorus ornatus*, pp. 177, 202; a cladogram reproduced from an older source shows the family Polychridae rather than the Polychrotidae, p. 318; *Aporosaura anchietae* [misspelled as *anchiatae*] is used in place of *Meroles anchietae*, p. 138), or in many cases, the same species is cited under two different names, suggesting that the names were employed as they were used in the primary literature without a uniform attempt to standardize and update them (e.g., a diagram is labeled *Trionyx spiniferus* rather than *Apalone spinifera*, on p. 143, although the latter name is found in a figure legend on p. 81; *Trachydosaurus rugosus* and *Tiliqua rugosa* are both used in the text and indexed separately; *Tropidonotus natrix* is used instead of *Natrix natrix* on p. 184, although the name in current use appears at least four other places in the text). In still other instances, species are wrongly assigned to genus or even to family (*Trionyx triunguis* is listed as *Apalone triunguis*, p. 171; *Gallotia stehlini* is referred to the Agamidae rather than the Lacertidae, p. 413; *Hyla kivuensis* is used for *Hyperolius kivuensis*, p. 142). Finally, a variety of incorrect statements result from higher order taxonomic changes that were obviously incorporated into the familial summaries, but whose ramifications for other parts of the text were not considered. Chief among these are the recognition of the Eublepharidae as distinct from the Gekkonidae, and the recognition of several families of pleurodont iguanians. The terms gekkonid and iguanid thus are sometimes used to refer only to the more restricted families recognized by the authors and sometimes to the more inclusive groups of limbed gekkotans and pleurodont iguanians, respectively. Thus, *Coleonyx* is referred to as a gekkonid rather than a eublepharid (p. 314), the herbivorous specializations of iguanines (pp. 304–5), meaning the group introduced earlier (p. 94) as the Iguanidae, are discussed and *Uma* is listed as a member of the Iguanidae (p. 244), whereas it is elsewhere (p. 257) correctly assigned to the Phrynosomatidae.

Many errors have also crept into the written statements of distribution and especially into the printed maps. I applaud the use of maps showing country boundaries. These help the reader to more clearly pinpoint the edges of ranges and allow a more accurate comparison with more detailed physical or political maps should one be so inclined. However, having gone to the trouble of preparing such useful maps, the authors have used outdated base maps (they illustrate a united U.S.S.R. and Czechoslovakia and a divided Germany) and they have made numerous errors with respect to plotted ranges. One of these, showing the distribution of gekkonids in the Caspian Sea, is obviously an oversight, but others deserve some comment.

According to the maps provided, sirenids are endemic to the United States, as their distribution in northeastern Mexico is not

plotted. The illustrated distribution of salamandrids in South Asia does not extend far enough to the west to encompass the entire Indian range of *Tylototriton verrucosus*, nor does it include northern Iraq, where *Neurergus* and several other taxa occur. The map for pipids excludes most of Namibia, although *Xenopus laevis* is common in most of the permanent waters of the country, including desert springs. That for bufonids suggests a complete absence of this group in North Africa, where seven species of toads occur. It also does not extend far enough north in central Canada to encompass the true range of *Bufo hemiophrys*. Pelomedusids are not mapped in southwestern Africa where the genus *Pelomedusa* is extremely common. The map for the Trionychidae excludes the Philippines, New Guinea, the Horn of Africa, and Angola (essentially the distributions of *Pelochelys* and *Trionyx*). Agamids are omitted from Greece and portions of Mongolia and the southern parts of Asian Russia. Among iguanids, the distribution of *Brachylophus* in Fiji is mapped, but that in Tonga is not. The gekkonid map omits northern Mexico, California, and Florida, as well as large areas of the Palearctic range of the family. Eublepharids are illustrated as absent from western peninsular India, most of Iran, Kenya, and mainland China and Vietnam where they occur (although the last two localities are recent discoveries and cannot reasonably have been expected to appear on the maps). Varanids are not shown as occurring in much of their Asian range. Scincids are not depicted in the Caucasus or the Russian far east. Likewise, their North American distribution is also incorrect, with the range of *Eumeces septentrionalis* in northern Minnesota, southern Manitoba, and North Dakota largely excluded. Anguids are not illustrated as occurring in the inland of California (nor in western Nevada, where they have recently been recorded). The boid genus *Candoia* extends further into the Pacific than indicated on the corresponding map on page 119, reaching the Tokelau Islands. The mapped distribution of viperids in southwestern Canada is too restricted; in Alberta *Crotalus viridis* extends to almost 52° N. Elapids are incorrectly shown as absent from much of Peru.

In some cases the maps and written description of distribution do not match: The text for the Scolecomorphidae (p. 51) mentions Cameroon, Malawi, and Tanzania, whereas the map excludes Malawi but also illustrates the family's occurrence in Mozambique and Nigeria. Likewise, pygopodids are not mapped as occurring in New Guinea, where two species, one endemic, actually occur, although the text on this point is correct (p. 99). *Laticauda crockeri* is not, as indicated on page 126, restricted to freshwater lakes in the Philippines, rather it occurs on Rennell Island in the Solomons.

Additional errors plague other portions of the book as well. My own favorite group of herps, the Gekkota, is hit fairly hard with inaccuracies. The squamate phylogeny presented represents the Gekkonidae, Pygopodidae, and Eublepharidae as an unresolved trichotomy. I know of no systematist who would not regard the Eublepharidae as the sister group to the others. On page 92 gekkonids but not eublepharids are mentioned as having temperature-dependent sex determination (TSD), although the most well studied lizard in this regard is the eublepharid *Eublepharis macularius*. Elsewhere *Gekko* is singled out as an example of a gekkonid exhibiting TSD. This is true for some members of the genus but sex chromosomes have been identified in at least one species of *Gekko*. Gecko setae are mentioned as being 60–90 microns in length. Such long setae characterize only some groups of geckos, with most species having much shorter structures. The genus *Rhacodactylus* is stated to be viviparous, when in fact only one species of six, *R. trachyrhynchus*, is. *All* geckos are cited as having autotomic tails [note that the italics here and throughout the review are mine]; *Nephrurus asper* does not. The description of another defensive strategy, regional integumentary loss, is also incorrect. Contrary to the book's description, the whole skin is not lost, the morphological adaptation to the loss is in the dermis, not the epidermis, and the skin takes many months to regenerate, although fibroblasts cover the wound site rather quickly. Likewise, contrary to the text on page 428, the tail-squirting mechanism in *Diplodactylus* (*Strophurus*) does not involve the use of hollow spines as conduits of the secretion. Sphaerodactyls are known to have arisen within gekkonines; thus, the recognition of the Sphaerodactylinae on page 98 creates a paraphyletic group. Finally, there are six, not five, eublepharid genera, all of which lack spectacles (on page 107 eublepharids are listed as having spectacles, whereas gekkonids are not).

Such problems are not limited to geckos, however. They begin with the origin of tetrapods (three living lungfish species are stated to exist—there are actually six, p. 24), continue through amphibians (*Karaurus sharovi*, a well-known Jurassic salamander, is stated to be from Russia, p. 38—it is in fact from Kazakhstan), and on to reptiles (*all* cordylids, except *Cordylus giganteus*, are described as rock-dwelling, p. 105—in fact *Cordylus macropholis* is associated with vegetation and *Chamaesaura* spp. are grassland inhabitants). Many of the other misstatements in the text are contradictory and are clearly evidence of lack of critical editing. On page 111 it is stated that there are more than 1800 snake species, although elsewhere the more reasonable number of 2700 is given. On page 125 there are "approximately 70 species of sea snakes," while on page 126 only 60 species are acknowledged. In the chapter on reproduction, figure 7-1 shows a stylized *Cnemidophorus* as the representative of gynogenetic reproduction whereas an ambystomatid is illustrated to represent parthenogenesis. This is in contrast to the (correct) attribution in the text of parthenogenesis to reptiles and gynogenesis (or perhaps hybridogenesis, or both) to ambystomatids. A statement on p. 125 that "species of the *Hydrophis* group have lost the one-to-one association of ventral scales with vertebrae" appears to contradict that on p.112 that "the 1:1 relationship between ventral scale rows and vertebrae, characteristic of *all* other snakes, does not hold in Typhlopidae and Anomalepididae."

Several other comments reflect over generalizations or exaggerations. For example, contrary to the statement that *nothing* is known of the natural history of *Osteolaemus*, there exist basic (though limited) data on reproduction, diet, and other life history parameters. Likewise, the statement that "*all* scleroglossans use some visual displays in aggressive and courtship interactions" (p. 363) is without firm basis. Vocal signals are not limited to gekkonids, as claimed by the authors (p. 364), although they may be the only squamates to produce complexly modulated calls. There are exceptions to the statement (p. 241) that metatarsals I–IV in lizards are tightly bound, specifically in geckos, in which the feet exhibit a secondary symmetry.

Still other statements, while true, may be confusing to the uninitiated. On page 113 the enlarged quadrate of leptotyphlopids is referred to as part of the lower jaw. Although it functions in the movement of the mandible, the quadrate forms the distal part of the upper jaw articulation and students who may remember their comparative anatomy may be stymied by this interpretation. The term chondrocranium is used to mean larval skull (p. 272). This is not the general use of the term which is typically applied to the endochondral portion of the skull except the visceral (or splanchnocranial) skeleton. The usage here includes both the chon-

drocranium and splanchnocranium and implies that the term applies during only the larval life stage. On page 231 it is stated that the lack of maxillary bones yields a pointed snout in *Necturus*. It should be clarified that the skull is pointed, but that the snout as a whole is definitely not. The presence of sonograms with no corresponding discussion of how to "read" them, and the discussion of physiological parameters without an explanation of the units involved may also prove to be difficulties for students who have not had courses in associated disciplines.

The production values of the book are generally high, typical of modern, expensive textbooks, although several of my colleagues have noted dissatisfaction with the thinness of the paper (photos and even text tend to show through pages), and the quality of the binding (like most textbooks it is low but serviceable). Photo and figure reproduction are generally good, but there are notable exceptions. Some figures taken from other sources did not reproduce well and probably should have been redrafted or reproduced by other means. In particular, those illustrating the morphology and mechanics of fossorial reptiles (pp. 258–259) and the feeding of a larval ambystomatid (p. 268), are problematic. Many problems are associated with the figure captions. Some figures from the primary literature were apparently relabeled, resulting in errors in the textbook that are not present in the original (e.g., p. 335). The skull diagrams of snakes (pp. 115–117) lack a legend to the many abbreviations used as does the series of diagrammatic tadpole cross-sections on page 277. The reptile heart diagrams on page 183 have some, but not all, of the abbreviations explained. Contrary to the caption accompanying the illustration of a gila monster on page 300, the grooves in the teeth of the lower jaw are not illustrated. A photograph of the Cuban crocodile bears the caption "*Crocodilus rhombifer* (Crocodylidae, Australia)" thus including a generic misspelling and allocation to the wrong continent.

The litany of minor faults listed above could, for the most part, be dealt with by a detailed errata sheet. On the level of broader issues and topics in *Herpetology*, I am disappointed with one major omission. The book's discussion of distribution is almost exclusively ecological. Historical factors are mentioned, but there is no historical biogeographic framework for explaining amphibian and reptile distributions. Thus, distributions are presented more as disparate facts rather than as a unified record of earth and biotic spatial history. Indeed the terms biogeography, zoogeography, tectonics, or vicariance do not appear in the index and are effectively absent from the text. There is also little information about extinct lineages of amphibians and reptiles, although these are often treated, at least in passing, in herpetological courses. In particular, most students have an interest in dinosaurs and some placement of these and other extinct lineages into broader phylogenetic and functional frameworks would probably be appreciated. Other omissions are more a matter of taste and personal preference, although I would have liked to have seen a more detailed treatment of venoms and a review of basic tadpole mouthpart terminology, and among the topics that might have been mentioned in the section on feeding and diets are the many nectivorous lizards and their potential role in pollination, and the existence of herbivory in at least one frog species.

Finally, the book is provided with a bibliography of over 1500 references, many as recent as 1997. The authors state clearly in the preface that the references are biased towards more recent and accessible literature. This is a practical goal and one that is met reasonably well. However, if students are to use the references as an entrée into the literature it is somewhat troubling to find that foreign language citations are few and that there are no senior author citations for leading herpetologists like Mertens, Darevsky, and Lanza, whereas there are 51 such citations for the papers by the authors of the textbook.

My specific complaints aside, I am loathe to discard the baby with the bath water and do feel that Pough et al. have done a service to the discipline in producing an up-to-date herpetology text. I acknowledge the tremendous effort that has gone into this volume and merely wish to note that the final product has perhaps emphasized the forest at the expense of the trees. There is clearly room for improvement and much tighter editorial control in subsequent revisions. Nonetheless, the most important question regarding any textbook is "should I adopt it for class use?" The answer in this case is a qualified yes. The shortcomings of *Herpetology* do not outweigh the benefits of being able to offer students an extensively illustrated and up-to-date course text. Nonetheless, I would not be comfortable assigning this book to my students without providing them with an errata sheet and redrafted maps. The fact of the matter is that "-ology" courses are a combination of major themes and concepts and a lot of nuts and bolts details, the type that are necessary in order for students to gain a comfortable working background with the organisms. I would hope that the authors and Prentice Hall would consider a corrected second edition of the book at the earliest possible date, even if major updates and additions are not contemplated in the near future.

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Amphibiens et Reptiles du Maroc (Sahara Occidental compris), Atlas biogéographique (Amphibians & Reptiles of Morocco [Including Western Sahara], Biogeographical Atlas), by Jacques Bons and Philippe Geniez. Trilingual (French, Spanish, English). Published by the Asociación Herpetológica Española, Barcelona, Spain.1996. Softcover, 320 pp. ISBN 84-921999-0-3. Pts 9,000.- (approx. US $60.00).

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Wolfgang Böhme stated in his foreword to *Amphibians and Reptiles of North Africa* by Schleich et al. that "in northern, i.e. palearctic Africa, a herpetological field guide is lacking so far." As it is always more informative if book reviews can be done in a comparative way, it is fortunate that this is not entirely true. First, a fieldguide to Saharan herps and fishes was published by LeBerre

in 1989. Second, Bons and Geniez have produced a new "biogeographical atlas" of the amphibians and reptiles of Morocco that is a direct competitor to Schleich et al.'s book, as it covers 11 of the 12 amphibian species and 93 of the 110 reptile species of Schleich et al.'s more geographically inclusive book. In fact, as a field guide for the non-specialist, the atlas of Bons and Geniez is more useful as it depicts every single species (except the extralimital *Acanthodactylus savignyi*) in a good color photograph whereas Schleich et al., although presenting a great many more or less detailed drawings, depict only about two-thirds of the species photographically, and the quality of these figures varies considerably. Some specimens were dead when shots were taken. Others are represented by extralimital specimens (e.g., *Blanus cinereus*, *Coronella girondica,* and *Vipera latastei* from Spain) or even different species (e.g., *Leptotyphlops cairi* for *L. macrorhynchus* in Fig. 117, an Asian *Echis carinatus* in Fig. 145). It is especially regrettable that less than half of the endemic species and only five of 15 southern Saharan species are illustrated in color. However, Schleich et al. include keys for all genera, whereas the 'atlas' regrettably lacks these.

Amphibians and Reptiles of North Africa is devoted to the herpetofauna of Morocco, Algeria, Tunisia, and Libya, with Egyptian species listed in an appendix. The book is made up of a general part and a species section. The general part is subdivided into an introduction, a general species list (not complete, see below), a description of climate and vegetation, a large zoogeographical section, including a number of transects showing species community change and a country-based list of species numbers per genus (not complete, see below), an equally extensive ecological section with tables on habitat choice, seasonal activity and reproduction cycles, population density and biomass, and transects through selected habitats. This general part, making up some 90 pages, contains a wealth of information. However, it is very difficult to review the extensive tables in detail, as they accumulate data from different authors without giving references.

The rest of the book consists of the species accounts. When available, the authors try to present details about morphology, ecology, behavior, habitat, activity pattern, population structure and dynamics, ecological parameters (community, prey, predators), reproduction, distribution and systematics. Schleich et al. obviously have tried to incorporate as much available information on each species as possible. As a consequence, the account of a well known species, *Uromastyx acanthinura,* occupies 13 pages with 33(!) line drawings and 6 color photos (albeit all of the nominate subspecies), whereas *Acanthodactylus longipes,* for instance, is accorded just one page, two drawings, and no photograph. Bons and Geniez generally devote only about one half text page (ranging from one quarter of a page to two half pages, in each of the three languages, French, Spanish, and English) to each species.

Despite providing more material, however, Schleich et al. display a great deal of information in an apparently unselective and confusing way. For instance, a two-page color plate is devoted to the different color phases a chameleon can attain. As there is only one species of *Chamaeleo* in North West Africa, this illustration appears unnecessary. It would have been much better to show a specimen of the desert form, C. *chamaeleon "saharicus,"* which has lost the ability of color change to a great extent. This special ecotype (or subspecies?) is not even mentioned. There are many other examples of interesting but superfluous information, such as (still in *C. chamaeleon*) drawings of hemipenis, movements of chromatophores, and the mechanism of tongue protrusion. A few examples from other species include: a sonogram of the distress call of the lacertid *Psammodromus algirus*, flow diagrams of social behavior in *Scincus scincus* and *Uromastyx acanthinura*, a cross section through the head of *Trogonophis wiegmanni*, illustrations of snake movement types, etc. The book could well be intended as an introduction to general herpetology for North African biology students, had it been written in French, the teaching language of most North African universities.

Much of the information presented by Schleich et al. seems to have been extracted from the literature without critical evaluation. There are many inaccuracies, but their sources are difficult to trace, as references to the origin of data and figures are only exceptionally given in an easily traceable way. Despite an extensive bibliography, many relevant articles were missed. I found the following more serious mistakes:

- Plate 51, intended to show *Tarentola boehmei*, in fact shows *T. mauritanica juliae*.
- *Psammophis sibilans* is reported as an inhabitant of Morocco, Algeria and Tunisia. In fact, the only place in North Africa where it occurs is the Nile valley (Brandstätter 1996).
- *Gymnodactylus moerens* is regarded a synonym of *Quedenfeldtia trachyblepharus*. Obviously, the authors overlooked that Arnold (1990) had separated *Q. moerens* as a separate species.
- *Scelarcis perspicillata* is included in *Podarcis*, although it had been demonstrated long ago that it is not related to that genus (Odierna et al. 1987; Mateo and Cano 1991). Other examples of taxonomic differences between the two books are given in Table 1.
- The Egyptian spitting cobra is called *Naja nigricollis*, although the species found in Egypt is in fact *N. pallida* (Golay et al. 1993).
- *Echis coloratus*, the second species of saw-scaled viper in Egypt (Joger 1984), is not included in the Egyptian species list nor in the key.
- *Testudo graeca* which does not inhabit Egypt (Buskirk 1996) appears in the Egyptian key.
- The revision of the *Chalcides chalcides* complex by Caputo (1993) unfortunately came to the attention of the authors once printing had already started. They included the revised taxonomy as an appendix, proposing corrections to the appropriate chapter. However, no corrections were proposed for the species lists (p. 8–9, p. 27, p. 36–51, p. 55–59) where *Chalcides mertensi, C. minutus,* and *C. pseudostriatus* are lacking, and *C. parallelus* appears under the name *C. ghiarai*.

There are some other omissions in those species lists such as *Lacerta pater* (lacking in the general species list, p. 9), *Bufo brongersmai* (not listed in the list of endemics of the Atlantic coastal strip, p. 27), the genera *Scincopus* and *Echis* (lacking in the regional checklist for Morocco, p. 55–56), genus *Agama* (not indicated for Libya, p. 55). In the checklist on p. 55, only one species of *Sphenops* is mentioned for Libya, whereas according to the map on p. 367, three species of that genus should occur there.

Despite a confusing number of species lists concerned with ecological and geographical variables, there is no species checklist for individual countries except a partial one for Egypt (excluding species only known from Sinai and species also occuring in other North African countries) which is presented as an appendix. Trying to extract reliable distribution information from the maps, which are often just raw sketches may result in erroneous or incomplete data. Examples include:

TABLE 1. Differences in the taxonomic treatment of North African amphibian and reptile species (* = more "progressive" taxonomy).

Schleich et al. (1996)	Bons and Geniez (1996)
*Salamandra algira**	*S. salamandra algira*
*Agama impalearis**	*A. bibronii*
Chalcides ghiarai	*Ch. parallelus**
Eumeces (schneideri) meridionalis	*E. algeriensis meridionalis**
Scincus scincus laterimaculatus	*S. albifasciatus laterimaculatus**
*Mesalina simoni**	*M. olivieri simoni*
Podarcis perspicillata	*Scelarcis perspicillata**
Acanthodactylus erythrurus lineomaculatus	*A. lineomaculatus**
Telescopus obtusus	*T. dhara**
*Echis arenicola**	*E. leucogaster*

- *Salamandra algira*: not shown from Tunisia from where it is known (Salvador 1996).
- *Stenodactylus sthenodactylus*: not shown from the Tunisian coast where it occurs (e.g., on the island of Djerba, which is mentioned in the 'island checklist' on p. 53).
- *Trapelus tournevillei*: only a small part of its actual distribution in Tunisia shown.
- *Acanthodactylus longipes*: not mentioned for Tunisia where it is abundant in dune areas.
- *Acanthodactylus scutellatus*: said to occur in Morocco where, according to Bons and Geniez, it is not present.
- *Sphenops delislei*: not mentioned for Morocco/West Sahara.
- *Bufo mauritanicus, Bufo viridis,* and *Mauremys leprosa* are reported to occur south of the Sahara (Mali/Niger). These records are erroneous (Joger and Lambert 1996).

In some difficult species complexes, the authors add to the existing nomenclatural confusion by using different names in different sections of their book. For instance, *Scincus albifasciatus* is listed as a valid species on p. 9, but is included in the species account of *Scincus scincus* and is lacking in the scincid key (p. 322). *Uromastyx* (*acanthinura*) *geyri,* the taxonomy of which is unsettled, appears as full species on p. 8 and 58. *Macrovipera* is sometimes included in *Vipera*. *Dicroglossus occipitalis* is called *Rana occipitalis* in the general section. *Acanthodactylus longipes* and *A. dumerilii* are regarded as semispecies in the *A. scutellatus* complex, whereas in the general section they are not separated from *A. scutellatus*, except in the species list on p. 9. A similar confusion applies to *A. bedriagai*, *A. busacki,* and *A. maculatus* in the *A. pardalis* species group.

TABLE 2. Mapped dots for rare species of Moroccan reptiles.

	Schleich et al. (1996)	Bons and Geniez (1996)
Dasypeltis scabra	2	5
Natrix natrix	7	16
Lamprophis fuliginosus	5	7
Bitis arietans	7	29
Vipera monticola	2	32
Lacerta andreanskyi	6	22
Psammodromus microdactylus	8	14
Mesalina pasteuri	1	6

These deficiencies not only demonstrate an insufficient literature survey but also suggest a lack of field experience.

Jacques Bons and Philippe Geniez, on the other hand, are well known specialists on Moroccan herps as evidenced by their extensive publication lists. Jacques Bons' field data have been accumulated over more than 40 years. Moreover, these authors relied on information gathered from about 200 field observers, among them many prominent herpetologists. The resulting distribution maps are really fascinating. There are two maps for each species: One for the traditional territory of Morocco, depicting single localities, and one for Morocco and the Western Sahara, showing distribution in squares of 22 x 25 km. Schleich et al. have only few dot maps for less common species; a comparison of some of them shows large differences (Table 2).

In contrast to Schleich et al., Bons and Geniez restrict the species part of their atlas to taxonomic and geographic information. Unfortunately, their texts are too short and lack identification characters (except in some cases, as in distinguishing between the two *Quedenfeldtia* species). When they discuss subspecies, as in *Scelarcis perspicillata* and *Tropiocolotes tripolitanus*, or high intraspecific variability, as in *Rana saharica*, they show additional photos. The general part of the text makes up some 50 pages (in fact only half pages, as it is bilingual, French and Spanish, with a rather poor English translation appended). An introduction is followed by a taxonomic list with scientific and vernacular names in three languages (but not in Arabic!). Climate and vegetation are briefly outlined. A biogeographical section classifies all species according to their affinities and gives information on centers of endemism and on altitudinal distribution. The history of herpetological research in Morocco, and the methodology of mapping the 'atlas' are explained. An interesting table displays abundance statistics derived from the number of individual recordings (*Agama bibronii* heading the list with more than 1000 observations; the rarest species being *Echis leucogaster* and *Scincopus fasciatus*). A section on conservation is included.

In conclusion, which book can be recommended for information on the North African herpetofauna? The choice is not easy. Certainly, the work of Schleich et al. contains much more information on the subject than any other. It would be an injustice to the authors not to acknowledge the great effort they have made. However, as outlined above, their uncritical and incomplete treatment of primary literature precludes the use of their work as a handbook and it is too expensive and inadequately illustrated to serve as a fieldguide. It could best be seen as a preliminary draft of a future handbook on North African herpetofauna. As a

source of taxonomic or distribution information, it can only be used with considerable caution. For that purpose, the atlas of Bons and Geniez is much more reliable. However, the latter is restricted to Morocco and the western Sahara.

To the participants of my annual student excursions to North Africa, I am recommending a combination of the taxonomically outdated Saharan fieldguide of LeBerre (1989) with the up-to-date atlas of Bons and Geniez (1996). Together they contain all North African herp species and cost less than the book of Schleich et al. Coming back to my introductory remarks on Böhme's statement, I have to admit that, in a strict sense, his complaint still holds true: a comprehensive and accurate fieldguide on North African herps is still needed.

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For the past fifty years the herpetofauna of Argentina has been José Miguel Cei's subject of study. His first publication on the biology of Argentine amphibians was in 1948 when he was professor at the Universidad Nacional de Tucumán in northern Argentina. Later, as Director of the Instituto de Biologia at the Universidad Nacional de Cuyo in Mendoza, he continued his intensive study of amphibians and published on a diversity of topics ranging from reproductive cycles, ecology, and taxonomy to a series of papers with V. Erspamer on the biochemistry of anuran skin secretions. In 1962 he published *Batracios de Chile* and in 1980 produced *The Amphibians of Argentina*, a 600-page comprehensive study in English published by the Monitore zoologico italiano (Italian Journal of Zoology). This book set a high standard, with detailed descriptions as well as extensive illustrations, including color figures of almost all the species, and extensive ecological information. In the early 1970's he had started studying Argentine reptiles and in 1986 authored, in Spanish, a 500-page book on the reptiles of western and southern Argentina (*Reptiles del Centro, Centro-oeste y Sur de la Argentina*) published by the Museo Regionale di Scienze Naturali in Turin, Italy. The text was a detailed description of each species, complete with ecological information and excellent color photographs of living specimens. The text included an English version of the keys.

Cei's most recent book covers the reptiles of the northern and eastern part of Argentina: *Reptiles del Noroeste, Nordeste y Este de la Argentina*, published in 1993 by the same museum in Turin. This is a 950-page tome presenting the rich and diverse fauna of this mostly tropical and subtropical region. The reptilian fauna of this part of Argentina contains 77 genera, in contrast to the 37 genera found in the more southern portion of Argentina covered in the 1986 volume. Like his previous books, it is profusely illustrated with excellent color photos of live specimens and of the habitats. The keys are in Spanish and English. The geography of the area covered includes a diversity of ecosystems ranging from tropical forests, semi-arid Chacoan habitats, pampas, and Andean mountains and plateaus.

Cei has done extensive field work throughout Argentina and has observed most of the species of this region in nature. This has certainly contributed to the excellent and diverse content of his species descriptions. Cei's taxonomic presentations are detailed and complete. Each species is presented with a diagnosis and if appropriate a discussion of the history of the species. This is followed by a more detailed description, the distribution and finally a section on the biological aspects of the species, including (when available) information about habitat, ecology, reproduction, feeding behavior, etc. The genera are also presented with a historical review and followed by a discussion of generic characters. The section (about 60 pages) on *Liolaemus* presents an excellent summary of the characteristics of the various subgenera and "groups" of this diverse genus. Cei also uses subgeneric classification in *Stenocercus*. He uses "group" classification for numerous genera. He supports his subgeneric and group classification on the arguments of Dubois (1982). Unfortunately, this citation was left out of the bibliography.

The text of this volume is encyclopedic. In his Introduction, Cei includes a section on hemipenal structure, another on karyotypic data, and a further section on biogeography. Under his infraorder Serpentes he presents a detailed discussion of the phyletic relationships of snakes. He follows McDowell's snake classification and presents a sophisticated and interesting discussion of snake evolution. His bibliography is extensive, with the earliest paper cited being a 1770's article by a Jesuit who published on the reptiles and amphibians of Paraguay.

Unfortunately, final proof reading was not possible by Cei and consequently the tome comes with a list of errata and corrections. Most of the errors are minor typos.

The book includes an appendix that adds the results of the Second Argentine Herpetological Congress of 1992 which appeared when the manuscript was at the printers, as well as a number of other papers that appeared at this time.

In summary, this opus is an excellent addition to the more than 40 years of research and publication carried out by Cei. His monographic studies of amphibians and reptiles have set a very high standard for fellow herpetologists.

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Lizards, by Manfred Rogner. 1997. Krieger Publishing Company, Malabar, Florida. 2 vols., 646 pp. Cloth. US $97.50. ISBN 0-89464-972-8.

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This two volume set represents an ambitious, and overall successful, attempt to distill all that is known about lizards into bite-sized morsels that are relevant to the hobbyist and amateur herpetologist. Information presented by the author should prove useful to the lizard keeper, but may be of limited use to scientific ventures beyond those reached via animal husbandry. These books originally were written and published in German in 1992. The version reviewed here was translated into English by John Hackworth.

The text is divided into three main divisions; the Introduction (2 pages), The Care and Husbandry of Lizards in the Vivarium (11 pages), and taxon accounts (565 pages). The books also include bibliographies of 323 (Vol. 1), and 338 (Vol. 2) citations that relate chiefly to captive management, and an index.

The Introduction includes background information on reptile classification, and very basic anatomy and life history of lizards and lizard-like reptiles (the author includes crocodilians and *Sphenodon*). This section is informative, but rather short. Most of this information would have been better presented in a separate section on lizard biology, rather than crammed into a two-page introduction lacking figures.

The section on care and husbandry provides a broad overview of vivarium design, lighting, temperature, nutrition, and reproduction. Oddly, this section also provides a chart of lizard squamation and some of the basic gekkonid toe morphologies. This material would have been better suited to a section on basic anatomy.

The taxon accounts are organized by family and subfamily using, in some cases, antiquated and, in other cases, fictional nomenclature. A brief overview is provided for each family, including an estimated number of species recognized, habitats utilized, and some basic defining characters that are attributable to the entire family, a daunting task especially when using paraphyletic groupings. Each family and subfamily is then represented in the text by species that at least occasionally enter the pet trade in Europe or North America. Many species are also depicted in attractive color photos. For each genus the number of species and a general physical description are provided. Species accounts within each genus are arranged alphabetically and organized into sections entitled "Distribution," "Description," "Habitat," and "Lifestyle, husbandry and reproduction." The last of these is generally the longest section.

Throughout the text subtle errors in taxonomy are made. These volumes could have referenced some of the more widely read and accepted systematics papers of recent years. Yet, virtually none of the changes in taxonomy that are associated with phylogenetic analyses of the past decade have been cited. This is most evident in the section entitled "Iguanas: Family Iguanidae," in which one can read about *Anolis* and *Basiliscus*. Frost and Etheridge (1989) elevated the subfamilies within the classic "Iguanidae" to familial status, an analysis and treatment that has been often discussed and debated, but generally accepted (but see Macey et al. 1997).

Additionally, all anoles are treated as *Anolis* of the subfamily "Anolinae." A few species listed as *Anolis* have the current generic name in parentheses (*Anolis* (*Norops*) *allogus*, etc.). In one case, the current genus name is provided in parentheses in the caption to a photo, but not in the text for that species—*Anolis* (*Norops*) *chrysolepis*. Guyer and Savage (1986) formally proposed the resurrection of the genus name "*Norops*" for anoles exhibiting "beta" caudal vertebrae as described by Etheridge (1959). Further reclassification of the genus *Anolis* was detailed by Savage and Guyer (1989) who employed the use of *Norops*, *Ctenonotus*, *Semiurus*, and *Dactyloa* as generic rankings. Although the acceptance of this classification is, at best, spotty, Rogner does list Guyer and Savage (1986) and Savage and Guyer (1989) in the bibliography for Volume 1 (with multiple typographical errors in the latter, including the wrong first initial for Guyer) but does not explain in the text why he chose not to use the nomenclature proposed by these authors.

High quality color photographs are used throughout both volumes. Many are of species seldom encountered by the average U.S. hobbyist. Among these are many species from Australia, Fiji, and Sri Lanka. At least one photo appears to be incorrectly captioned. The photo of a gecko on page 105 of Volume 1 is captioned "*Tarentola delalandii*." However, based on the figure on page 10 of the same volume, it seems that the species is a *Hemidactylus*.

The main goal of this set seems to be to provide information useful in the care and management of captive lizards. Perhaps specialists in the captive care of specific groups of lizards can find minor fault with some sections. For example, basic care information for all geckos of the genus *Phelsuma* is provided in the section for *P. abbotti* (alphabetically the first species treated) and all other species are referenced back to *P. abbotti*. Care and management information for all other species begins with the "See *P. abbotti*" or cites some other species that is, in turn, referenced to *P. abbotti*. Some species contain augmented information, indicating that the care requirements within the genus are not absolutely uniform. However, for most species the qualifying sentences are not strong enough, nor do they possess enough information to ensure that the reader will not become confused and maintain the species as one would *P. abbotti*. Few, if any, day gecko breeders consider *P. abbotti* to be representative of the genus in terms of its needs in captivity. In fact, it could be argued that there is no single representative "typical" species of *Phelsuma* with respect to care. A more valuable reference for care and maintenance of day geckos might be McKeown's (1993) book on the subject.

The last three chapters of Volume 2 are devoted to Amphisbaenia, Rhynchocephalia, and Crocodilia. It is somewhat disappointing that a book that could offer so much information for the lizard-keeping enthusiast apparently needs to include these non-lizard groups. Rogner explains that amphisbaenians may not,

in fact, be lizards and cites Böhme (1988) as evidence. However, Rogner does not then explain why he includes these animals in his book. That is, he provides evidence against their inclusion, but includes them anyway. The information on husbandry of amphisbaenians is limited to four species, but is particularly interesting given their rarity in the pet trade.

Tuataras, another group of non-lizards, are referred to as the "Bridged Lizards" (the literal translation of the German "Brückenechsen"). Rogner provides no indication that they are not lizards, aside from noting that they belong to the Order Rhynchocephalia. He also indicates a single species of the Order, *Sphenodon punctatus*, but refers to three subspecies including *S. p. reischeki* "which some herpetologists consider to be a separate species." In fact, the second species is *Sphenodon guentheri*. Rogner continues by providing information on the care in captivity for some of the tuataras kept in zoos. While this information is interesting it is not practical for the keeper, given the complete protection afforded tuataras.

Crocodilians are described in the text as "Armoured Lizards." Rogner points out, correctly, that they are "more closely related to birds than to any other reptiles living today," but does not indicate why he includes them in his treatise on lizards. Inclusion of these three groups of reptiles (Amphisbaenia, Rhynchocephalia, and Crocodilia) in a book on lizards may be similar to including lungfish in a book on frogs, or platypus in a book devoted to waterfowl. While the information is interesting and of some use, and the photos are attractive, it simply doesn't fit with the theme of the book. If the title of the two volume set were "Lizard-shaped Reptiles" then they could logically be included, but it is not.

Taxonomic errors and the inclusion of non-lizards aside, Rogner's two volume set "Lizards" is the most thorough and up-to-date popular treatise of the general biology and care in captivity of non-ophidian squamates to come along in quite some time. Its value as a reference for the general husbandry of many species may be unprecedented as some species are covered nowhere else in the hobbyist literature. No other current reference on this topic covers as much of the diversity of lizards in as much detail as this set. This set should make a welcome addition to most lizard keepers' libraries, providing that it is not relied upon as a taxonomic reference.

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PUBLICATIONS RECEIVED

Frogs and Reptiles of the Sydney Region, by Ken Griffiths. 1997. University of New South Wales Press, Sydney, Australia. 125 pp. Softcover. US $24.95. ISBN 0 86840 432 2. [Available in the USA from International Specialized Book Services, Inc., 5804 N.E. Hassalo Street, Portland, Oregon 97213-3644, USA].

A short guide to the 35 frogs and 70 reptiles found in greater Sydney and adjacent areas of New South Wales. Species accounts include identifying features, brief ecological notes, species status in the Sydney region, and one or more color photos per species. In addition, short sections on observing, recording, and photographing amphibians and reptiles, reptile legislation, a glossary, selected secondary references, and an index are provided. The reptile section of the book is an updated and revised version (with new photographs) of the author's 1987 book *Reptiles of the Sydney Region* (Three Sisters Productions, Winmalee, NSW).

Herpetología Neotropical, Actas del II Congresso Latinoamericano de Herpetología, II Volumen, edited by Jaime E. Péfaur. 1996. Universidad de Los Andes, Mérida, Venezuela. 451 pp. Softcover. US $40.00. ISBN 980-221-944-4. [Available from the editor, Facultad de Ciencias, Núcleo La Hechicera, Universidad de Los Andes, Mérida 5101, Venezuela].

This is the second volume published as a result of the Second Latin American Herpetolgical Congress held in Mérida, Venezuela in 1990 (the first being the *Directotio de Herpetologos Neotropicales*, 1994). Included are 25 contributions dealing with the anatomy, evolution, reproduction, ecology, biogeography, and management of the Latin American herpetofauna, along with the herpetological history, and bibliography of Venezuela. Each paper is written in Spanish, Portuguese, or English. Although other regions are represented, Venezuelan and Brazilian contributions are the most numerous. All scientific contributions are fully referenced and most are accompanied by black and white photographs, illustrations, maps, or graphs.

Biologie und ôkologie der Kreuzkrîte, by Ulrich Sinsch. 1998. Laurenti Verlag, Dr. Burkhard Thiesmeier, Akademiestr. 39, D-44789, Bochum, Germany. 222 pp. Softcover. DM 44 (approx. US $25 + $3 postage). ISBN 3-933066-01-8.

This monograph provides a comprehensive overview of the biology of the natterjack toad (*Bufo calamita*), a well-known European species of particular conservation concern in some areas. Included are sections on evolution and taxonomy, biogeography, physiology, behavior, ecology (reproductive, larval, adult, and population), and conservation. The work pulls together the author's own extensive research on this species as well as that conducted by others throughout Europe. It includes an extensive bibliography (through 1997) and a subject index. Over 100 black and white illustrations and photos and four color plates complement the text. The book should be of special value to amphibian biologists with ecological and conservation interests and to anyone working with the European herpetofauna.

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