NATURAL HISTORY NOTES

Instructions for contributors to Natural History Notes appear in Volume 28, Number 1 (March 1997).

CAUDATA

PLETHODON MISSISSIPPI (Mississippi Slimy Salamander). **VOCALIZATION.** Sound production is limited in the order Caudata (Duellman and Trueb 1994. Biology of Amphibians. John Hopkins Univ. Press. Baltimore, Maryland. 670 pp.). However, vocalization has been documented in the family Plethodontidae (Maslin 1950. Univ. Colorado Studies, Ser. Biol. 1:29–45). Members of the genus *Plethodon* produce soft squeaks, clicks, or yelps (Harper 1930. Copeia 4:153; Mansneti 1941. Copeia 4:266), and are the most vocal of the plethodontids (Neill 1952. Copeia 195–196). On 24 August 1996 around Poplar Cove Spring at the University of Mississippi Biological Field Station located in the North-Central Hills physiographic province of Lafayette County, Mississippi, USA, an adult *Plethodon mississippi* (75 mm SVL) was found under a wooden cover board. While this individual was being observed, it produced a series of five distinctive squeaks. This event paralleled the observation of Mansneti (*op. cit.*) for *P. glutinosus* in Maryland and *P. grobmani* in Florida. The production of squeaks has also been documented for *P. grobmani* (Harper, *op. cit.*) and *P. glutinosus* in Georgia (Neill, *op. cit.*).

Although Maslin (*op. cit.*) explained the anatomical mechanisms for sound production in caudates, the function of these vocalizations is only vaguely understood. Presumably, sound production plays a role in defense against predators (e.g., Brodie 1978. Copeia 1978:127–129) or social encounters (e.g., Davis and Brattstrom 1975. Herpetologica 31:409–412).

I thank R. Austin, E. D. Keiser, and S. Marshall for their assistance in preparing this note. I also thank the Mississippi Wildlife Heritage Program for funding.

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ANURA

ATELOPUS CHIRIQUIENSIS (Chiriquí Harlequin Frog). **MATING BEHAVIOR and EGG LAYING.** The life history of the neotropical harlequin frogs of the genus *Atelopus* has been difficult to document (McDiarmid 1971. Bull. Los Angeles Co. Mus. Nat. Hist. 12:1–66). Several natural history studies have provided a general understanding of the life cycles of some species of *Atelopus*, but significant variation in some life history parameters may exist within the genus (Duellman and Lynch 1969. Herpetologica 25:231–240; Cocroft et al. 1990. Copeia 1990:631–643; Gray and Cannatella 1985. Copeia 1985:910–917; Jaslow 1979. J. Herpetol. 13:141–145).

Descriptions of egg-laying and reproductive behaviors are few or non-existent in *Atelopus* and information given here should be useful for conservation of this genus. Starrett (1967. Herpetologica 23:195–204), Mebs (1980. Salamandra 16:65–81), and Lynch (1986. J. Herpetol. 20:126–129) gave accounts of the eggs and larvae of *A. varius*, *A. cruciger*, and *A. subornatus*. These reports provided valuable descriptive information about the eggs of *Atelopus*, but did not address the actual event of deposition and related behaviors. On 18 February 1994, we observed paired *A. chiriquiensis* adults preparing to lay eggs on the substrate of a

swift, montane stream in cloud forest (2005–2100 m) at Las Nubes Park Headquarters of Parque Internacional La Amistad, Provincia de Chiriquí, Panamá. The climate of these western Pacific slope highlands has been classified as temperate wet and dry (Rubio 1965. Comisión del Atlas de Panamá, pp. 31–33. Dirección de Estadistica y Censo, Panama City; Koppen 1931. Grundiss der Klimakunde, pp. xii–388. Walter de Gruyter & Co. Berlin). Water temperature was 10.8°C and air temperature was 17.6°C at 1300 h. We observed at least 85 males and 12 females along a 10 m stretch of creek. All females were found in axillary amplexus and solitary males were observed trying to pry amplexed males off of the backs of females. In all cases observed, males originally amplexed were able to hang on despite attempts to dislodge them. Amplectant pairs would submerge to the stream bottom for 15–30 min. Females may have been searching for egg laying sites. Of randomly selected individuals, average female size was 43.30 mm ± 0.57 SVL and 5.32 g ± 0.31 (N = 5); males measured 31.12 mm ± 0.62 SVL and 1.99 g ± 0.24 (N = 5).We returned to the same creek at 1845 h on 20 February 1996 and found several pairs (N = 5) and solitary males (N = 5) apparently still active in the darkness.

We collected 10 live specimens for further observation at the Smithsonian Tropical Research Institute. Two days later we observed egg laying by one pair in a small plastic container partially filled with unchlorinated water; 364 unpigmented eggs were laid in two strings over the course of 8–10 h on the late evening of 22 February and early morning of 23 February 1994. Egg deposition was monitored carefully every 30–40 min and it appeared that deposition was a single continuous process. Lack of pigment in the eggs of *A. chiriquiensis* is consistent with the observations for other species of *Atelopus* (Mebs, *op. cit.*; Lynch *op. cit.;* Starrett, *op. cit.*) . Eggs were laid in a massive clutch and were impossible to separate without breaking strings. It appeared that egg laying was a single event, as the female was entirely spent afterward.

The total length of a continuous string was estimated at 36–44 cm, considering that egg densities were consistently 11–13 per 25 mm of any given segment. Individual eggs measured 2.05 mm ± 0.30 (N = 10) in diameter in a protective gel case measuring 3.63 mm ± 0.34 (N = 10) in diameter. The number and size of eggs is larger for *A. chiriquiensis* (N = 364; 2.05 mm) than reported for *A. cruciger* (N = 271; 1.6–1.8 mm) (Mebs, *op. cit.*). During egg laying, the male kicked his legs two or three times before the female would squeeze out 3–5 more eggs into each string. Such leg movements may represent tactile cues to the female to synchronize egg release with milting. Eggs were watched carefully but did not appear to develop. The eggs were fixed in 10% formalin and deposited in the Higher Vertebrate Collection at the Museum of Biological Diversity at Ohio State University (OSUMZ 5054).

In June 1994 and May 1996, EDL returned to the original breeding site and found no *A. chiriquiensis*. It is likely that eggs are deposited during the short dry season of this region and that a massive migration of adult individuals occurs toward the stream valleys as hypothesized by Lynch (*op. cit.*). During June 1994, several adult *A. chiriquiensis* were found along the Rio Candela 9 km W Las Nubes. Amplectant pairs were seen migrating toward the stream, but the density of individuals did not match that seen in the previous February at Las Nubes. Perhaps local rainfall patterns determine the timing of reproduction.

We are grateful for the assistance of A. S. Rand, T. Hetherington, R. Ibañez, J. Kink, and M. Lindquist. Financial support was provided through a Smithsonian Tropical Research Institute short-term graduate fellowship (EDL). We thank IN.RE.NA.RE. for granting wildlife permits.

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HYLA MINUTA (NCN). **TADPOLE BEHAVIOR**. Heyer et al. (1975 Biotropica 7:100–111) considered tadpole predation by other tadpoles as an important ecological aspect of the tadpole communities in small, ephemeral ponds that are colonized by few anuran species and which are usually opportunistic breeders. *Hyla minuta* is widespread in Brazil, occurring in a variety of habitats. Herein, we report on the predatory behavior of tadpoles taken from a permanent pond ca. 1000 m elev. near São Bento do Sul, Santa Catarina, Brazil. The pond was fully exposed to the sun and was ca. 1.2 m at the deepest point with a dense growth of *Juncus* surrounding part of the pond. No predaceous fish were observed.

Freshly collected *H. minuta* tadpoles were placed in plastic bags for transportation. These tadpoles showed a bright red cast on the tail, appearing somewhat similar to *H. senicula*. After an hour in the bags the tail fin and tail musculature of some of tadpoles had been destroyed (Fig. 1); other individuals were bitten on the belly and died shortly thereafter. Injured individuals were attacked by the other tadpoles and were completely torn apart.

No information exists on the importance of this predatory behavior in natural habitats, however in the laboratory, *H. minuta* tadpoles (34 mm TL; stage 36) attacked and completely consumed *Physalaemus* sp. (*signifer* group, 16 mm TL; stage 33) tadpoles. The *H. minuta* tadpoles are facultatively carnivorous as they were observed to feed on commercial fish food and plant material in the laboratory.

Additional information is needed on the breeding habitats of *H. minuta*. As a facultative carnivore, *H. minuta* may better exploit food availability in each situation where it occurs, thus accounting for its widespread distribution and common occurrence.

We thank Sergio Caralho and Silva and Richard Schasse for help with field work, and W. R. Heyer for reading the manuscript.

FIG. 1. Effects of conspecific predatory behavior in *Hyla minuta* tadpoles, ranging from an undamaged individual (1) to one showing severe tail damage (4).

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HYLA SANBORNI (NCN). **PREDATION**. The predation of adult anurans by invertebrates seldom has been reported in the literature (Hinshaw and Sullivan 1990. J. Herpetol. 24:196–197), although spiders may be considered one of the most important predators of small terrestrial anurans (Hayes 1983. Biotropica 15(1):74–76). Lycosid spiders are most frequently found on the banks of water bodies, where they await their prey (Wise 1993. Spiders in Ecological Webs. Cambridge University Press, New York. 328 pp.).

On 22 November 1994 at 2245 h (air temperature 22°C) in Rio Claro (22°24'S, 47°33'W), São Paulo, Brazil, a lycosid spider (*Diapontia* cf. *uruguayensis*; 9.5 mm cephalothorax and abdomen length) was observed on a 0.1 m high web in the emergent vegetation along the margin of a brook. The spider was positioned between two calling adult male *Hyla sanborni* (mean total length = 18.3 mm) separated by 0.5 m from one another. One of the frogs moved during a presumed territorial dispute, emitted an encounter call (*sensu* Wells 1977. Anim. Behav. 25:663–693) and invaded the web, where it was captured by the spider. The spider held the frog for 45 minutes, with its chelicerae introduced into the end of the frog's abdomen. At the end of this time, the frog was completely immobilized. Both frog and spider were collected and, in the laboratory, the spider was observed to eat the frog's viscera. The spider was preserved and deposited in the Departamento de Zoologia - UNESP - Sao José do Rio Preto (DZSJRP-UNESP, without catalog numbers).

We thank C. F. B. Haddad and A. Cais for suggestions on the text, and L. C. B. Renner for identifying the spider.

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LITORIA INERMIS (Bumpy Rocket Frog). **REPRODUCTION**. The extent to which female frogs influence selection of amplectant partners is poorly known. While it is recognized that a female may make the primary choice of a male based on properties of his acoustic signal (Arak 1988. Behav. Ecol. Sociobiol. 22:317–327; Schwartz 1986. Ethology 73:116–127; Sullivan 1983. Anim. Behav. 31:1011–1017), female frogs, as they proceed through densely populated choruses towards their chosen partners, are undoubtedly susceptible to ambush by nearby males, and therefore may actually have little choice in their resultant mates. Few studies can be found that document amplexus as a result of female choice, and thereby actually confirm a female frog's choice of partner (see Arak, *op. cit.*).

At ca. 2200 h on 10 February 1996, while searching for breeding frogs in savanna woodland, we observed a pairing of *Litoria inermis* in a chorus ca. 40 km W Townsville, Australia (146°25'E19°25'S). A male frog was calling continuously from a small patch of bare ground between large grass tussocks. We watched for some minutes before a female approached and stopped within 10 cm of the calling male. The male called incessantly, but did not approach the female. The female then circled the calling male in a series of short low hops, and again stopped ca. 10 cm from its vocal sac. The female then made a few short hops towards the male until her snout appeared to touch the male's snout. Immediately, the male deflated his vocal sac and hopped onto the female to assume the amplexed position. Both frogs then hopped off into the moonrise.

Throughout the event, no other males approached the pair. The selected male did not make any approach towards the female until she touched his snout. The male was well within the chorus and other calling males were heard nearby. This suggests that the female selected and approached this calling male through the others. Ambush of the passing female by this or any other male was not observed. Males appeared to be evenly spaced and no satellite males were observed. While our observation represents only a single incidence, it supports the idea of amplexus initiation by female choice of reproductive partner and raises the question of the use of tactile communication to initiate amplexus between frogs.

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OSTEOPILUS SEPTENTRIONALIS (Cuban Treefrog). **PREDATION**. The Cuban treefrog (*Osteopilus septentrionalis*) of the West Indies has colonized Florida successfully over the past 40 years. The susceptibility of *O. septentrionalis* to novel predators in Florida is an open question, although predation by owls and snakes has been recorded for Florida (Love 1995. Herpetol. Rev. 26:201–202; Meshaka 1996. Florida Field Sci. 24:15; Meshaka and Ferster 1995. Florida Field Sci. 23:97–98). Here, we document predation by a new species, the common garter snake (*Thamnophis sirtalis*), on *O. septentrionalis* and present results of a field trial. Voucher specimens are housed in the Everglades Regional Collection Center in Everglades National Park, Homestead, Florida, USA.

On 21 November 1992 at 0200 h on Gumbo Limbo Trail, Royal Palm Hammock, Paradise Key, Everglades National Park, an *O. septentrionalis* ca. 40 mm SVL was offered to a *T. sirtalis* ca. 600 mm SVL that was resting 2.0 m above ground in the branches of a soapberry tree. Within 30 s of the offer, the snake grabbed the frog by its lateral aspect. Struggling and crying, the frog was ingested head-first within a few minutes. When the snake was observed 20 min later, it had not left its perch and the frog had not been regurgitated. Captive *T. sirtalis* have shown no ill effects for one week after ingesting *O. septentrionalis*.

On 19 July 1996 at ca. 2200 h we uncovered a male *T. sirtalis* (EVER 303586, 285 mm SVL) beneath a board near the buildings of a campground located near the intersection of US-1 and SW 344 Str., Florida City, Dade Co., Florida. When palped, the snake regurgitated a partially digested *O. septentrionalis* ca. 25 mm SVL.

It appears that the colonization of *O. septentrionalis* in Florida has progressed despite a list of novel predators which, like those of the West Indies (Schwartz and Henderson 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History. Univ. Florida Press, Gainesville), are primarily ophidian.

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9336, Homestead, Florida 33034-6733, USA, and **KEVIN P. JANSEN**, Department of Biology, University of South Florida, Tampa, Florida 33620-5150, USA.

RANA SYLVATICA (Wood Frog). **EGG MASS FEATURES** and **LARVAL BEHAVIOR.** Although *Rana sylvatica* egg masses have been described (Johnson 1987. The Amphibians and Reptiles of Missouri. Missouri Dept. Conservation, Jefferson City. 368 pp.; Wright and Wright 1949. Handbook of Frogs and Toads. Comstock Publ. Co., Ithaca, New York. 640 pp.), observations from oviposition to hatching and afterwards are lacking. Such observations were recorded as part of a translocation project (Thurow 1994. Trans. Illinois Acad. Sci. 87:83–97) in McDonough Co., Illinois, USA. Observations from at least seven years are summarized below.

Different surface/volume (S/V) ratios of frog egg masses have been correlated with average temperature and water oxygenation differences (Moore 1940. Am. Nat. 74:89–93). Moore proposed that the rounded egg masses of early breeders like *R. sylvatica* should protect better against cold, and that the thin surface film masses of later breeders like *R. catesbeiana* should aid gas exchange at warmer temperatures. However, in nature, the S/V ratio of *R. sylvatica* egg masses changes, in a way which would further increase fitness: as an object departs from a spherical shape, the S/V ratio increases. Instead of crawling forward in shallow water during oviposition like *Bufo americanus*, *R. sylvatica* stays at an underwater branch, root, or weed stem and makes minor movements. Each string of eggs folds back on itself and adheres into a globular mass that becomes turgid when the jelly imbibes water and swells. During the 2–3 weeks before hatching, the egg mass changes shape and increases its S/V ratio, presumably through softening and deterioration because of bacterial action. Less than two weeks after oviposition the flattened mass may appear as loosely coiled strings of pearls, because some of the stickiness between strands has disappeared. Further deterioration of the jelly makes a soft continuous flat mass, if not a thick film. This S/V change favors oxygen diffusion as temperatures rise from March into April.

When embryos hatch in April, the jelly mass gives protection, aided by a transient hatchling behavior. Hatchlings tend to stay in or under the jelly mass for several days, gaining shelter from predators while their swimming abilities improve. There is a temporary hatchling attraction to the jelly mass, which lasts from hours to a few days. When hatching egg masses are agitated the tadpoles swarm out in a cloud, but most return into the jelly within a few minutes. In a few days the tadpoles disperse, to rest on or below underwater leaves or branches. Later in the spring larvae tend to move to deeper water away from the pond edges. Within a few days of hatching some of the hatchlings appear to feed on their own jelly masses which have algal growth both outside and inside (Gilbert 1942. Ecology 23:215–227).

These studies were supported partly by 1986/87 non-game wildlife conservation grants from the Illinois Department of Natural Resources utilizing tax check-off funds.

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SPEA MULTIPLICATA (New Mexico Spadefoot). **DEFENSIVE POSTURE.** Anurans frequently employ posture as a defensive mechanism (Duellman and Trueb. 1986. Biology of Amphibians. McGraw-Hill Book Co., New York xix + 670 pp). To our knowledge, no defensive postures have been described for western spadefoots, including *Spea multiplicata*.

On 28 May 1995 a *S. multiplicata* was found buried in moist, sandy soil under a small rock in Vogel Canyon, Otero County, Colorado, USA. Air temperature was 15°C, ground temperature was ca. 17°C. The animal was rinsed with water to wash off the sand prior to being photographed. At this time the spadefoot assumed a crouched position with the chin near the ground and the eyes closed. It remained rigid and immobile in this position for several seconds. When it began to relax, a slight touch on the snout was sufficient to induce resumption of the posture.

Crouching has been included as a defensive posture in *Scaphiopus holbrooki* by Marchisin and Andrews (1978. J. Herpetol. 12(2):151–155). C. K. Dodd, Jr. (pers. comm.) described *S. holbrooki* as tucking its body into a convex curve with eyes closed and limbs held tightly against the body. In contrast, the forelimbs of *Spea multiplicata* were not held so tightly against the body.

We thank C. Kenneth Dodd, Jr., for his assistance in the preparation of this note.

FIG. 1. *Spea multiplicata* defensive posture.

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TESTUDINES

CLEMMYS MUHLENBERGII (Bog Turtle). **PARASITISM.** The larvae of certain species of flesh fly (Diptera: Sarcophagidae) are parasitic on vertebrates, and one species, *Cistudinomyia cistudinis* (Aldrich), is a fairly common parasite of box turtles (*Terrapene*) and tortoises (*Gopherus* and *Testudo*) (Knipling 1937. Proc. Entomol. Soc. Washington 39:91–101). Chidester (1915. J. Parasitol. 2:48–49) also reported an instance of parasitism, apparently by this fly, on the painted turtle (*Chrysemys picta*). We here report several instances of parasitism, apparently by *C. cistudinis*, on the bog turtle (*Clemmys muhlenbergii*) in North Carolina, USA (Table 1).

Because the parasites were either not collected or not reared to adulthood, it is impossible to identify them to species. However, those larvae that were collected were positively identified as sarcophagids and are thought to be *Cistudinomyia cistudinis* (David L. Stephan, pers. comm.), the only North American sarcophagid known to be a true parasite on adult reptiles (Knipling, *op. cit.*).

TABLE 1. Records of flesh fly parasitism in *Clemmys muhlenbergii* from North Carolina. Where retained, specimens were deposited in North Carolina State Museum of Natural Sciences (NCSM) or entomological collections of North Carolina State University (NCSU).

Date	Locality	Size and sex of turtle	Collector(s)	# of fly larvae and location on host	Fate of specimens
19 July 1977	Henderson Co., ca. 2.4 km W of Etowah	adult female	R. T. Zappalorti	1 near left shoulder	Larva removed and discarded; turtle marked and released.
19 July 1977	Henderson Co., ca. 2.4 km W of Etowah	subadult female	R. T. Zappalorti	1 in neck	Larva removed and discarded; turtle marked and released.
4 May 1985	Clay Co., ca. 9 km NE of Shooting Creek	adult male	K. M. Fahey	9 between neck and right foreleg	Larvae removed and discarded; turtle collected and died a few weeks later (NCSM 31691).
29 May 1988	Macon Co., ca. 5.3 km S of Aquone	adult male	B. J. and R. W. Johnson	17 near right rear leg	Turtle found fresh dead (NCSM 29286); larvae to NCSU.
23 June 1996	Wilkes Co., ca. 4.8 km ENE of McGrady	adult female	J. C. Beane R. A. Davis W. H. Rowland, Jr.	4 between neck and right foreleg	Turtle marked and released; larvae to NCSU.

Our observations apparently represent the first published records of parasitism on *C. muhlenbergii* by a sarcophagid fly. These flies have been known to cause death in *Gopherus* (Knipling, *op. cit.*) and *Terrapene* (Rainey 1953. Herpetologica 9:109–110). It is possible that flesh fly parasitism could be a significant, if hitherto overlooked, cause of mortality in some bog turtle populations.

We thank D. L. Stephan for identifying the larvae and providing references, K. M. Fahey and D. W. Herman for sharing information, and Ira Gambill for property access. These observations were made possible in part by "Project Bog Turtle," a funding initiative of the North Carolina Herpetological Society.

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LEPIDOCHELYS KEMPI (Kemp's Ridley), ***CARETTA CARETTA*** (Loggerhead), and ***MALACLEMYS TERRAPIN CENTRATA*** (Carolina Diamondback Terrapin). **DIET and PREDATION.** *Lepidochelys kempi* and *Caretta caretta* feed on a variety of marine vertebrates and invertebrates (Bjorndal 1985. Copeia 1985:736–751; Dodd 1988. U.S. Fish Wildl. Serv. Biol. Rep. 88:1–110). Here I report two separate accounts of marine turtles feeding upon *Malaclemys terrapin centrata*, a species not previously reported in the diets of *L. kempi* or *C. caretta*.

On 8 June 1993, a Savannah Science Museum (SSM) research team found a dead female *L. kempi* (SSM 12640; 63.5 cm curved carapace length [CCL]; 62.5 cm curved carapace width [CCS]) at Wassaw National Wildlife Refuge, Georgia, USA. Gastrointestinal (GI) tract analysis revealed food items commonly seen from *L. kempi* specimens in Georgia waters (unpubl. data): blue crabs (*Callinectes sapidus*), spider crabs (*Libinia dubia*), stone crabs (*Menippe mercenaria*), and mud snails (possibly secondary ingestion, *Nassarius obbsoletta*). In addition to these items, two freshly eaten *Malaclemys* also were found; one of adult male size (12.2 cm estimated CCL; 7.6 cm estimated CCW; SSM 13753), and one unsexed juvenile (CCL and CCW were not taken due to condition of specimen; SSM 13754). Both *Malaclemys* were crushed at the rear of the carapace, the second suffered more severe damage than the first.

On 22 May 1996, a subadult female *Caretta caretta*, (72 cm CCL; 65 cm CCW; SSM 13758), found dead in the Wilmington River (Wilmington Island, Georgia), also had remains of *Malaclemys* within its GI tract. These were badly decomposed and thus were not measured. Examination of the *Malaclemys* remains suggests that three individuals were eaten by the *Caretta*; based on the presence of three heads, six forelimbs, and three sections of carapace still containing nuchal bones. According to head size, two individuals were of juvenile size (SSM 13755–56) and the third was the size of a large adult female (SSM 13757). Additional stomach contents of the *Caretta* were horseshoe crabs (*Limulus polyphemus*), blue crabs (*Callinectes sapidus*), knobbed whelks (*Busycon carica*), and Keiner's whelks (*Busycon keineri*).

These observations are of interest as it is assumed that *L. kempi* and *C. caretta* feed upon slow to moderately slow-moving benthic organisms. These records also suggest that fish found in stomachs of *C. caretta* and *L. kempi* may have been captured alive rather than consumed as carrion from shrimp trawler by-catch.

I thank the Georgia Department of Natural Resources (Coastal Resources Division, Brunswick), the U.S. Fish and Wildlife Service (Savannah Coastal Refuges), and all of my co-workers at the Caretta Research Project and the Savannah Science Museum.

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TRACHEMYS GAIGEAE (Big Bend Slider). **REPRODUCTION.** Little information is available on clutch size in *Trachemys gaigeae*. Legler (1960. Herpetologica 16:139–140) reported clutches of 6–11 oviductal eggs in four females (169–202 mm carapace length) collected on 26 June 1959 in Chihuahua, Mexico. Here we report an unusually large clutch from a New Mexico *T. gaigeae*.

On 8 June 1988 one of us (CWP) collected a gravid female (224 mm straight-line carapace length along midline) from the north end of Elephant Butte Reservoir, Socorro Co., New Mexico, USA. The specimen was sacrificed 3–4 weeks later, dissected for tissue samples, and preserved in the Herpetology Division of the University of New Mexico Museum of Southwestern Biology (MSB 50523). Although a cursory examination indicated this specimen contained at least 10 shelled eggs (Degenhardt et al. 1996. Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. xix + 431 pp.), a more thorough dissection revealed a clutch of 29 eggs (mostly to completely shelled), of which 24 were in the oviducts and 5 in the abdominal cavity. Mean egg length and width (post-preservation, in mm) were 37.3 ± 1.6 SD (34.5–40.3) and 22.8 ± 0.6 SD (21.5–24.0). A small (13.6 x 11.1 mm), ovoid , shelled egg also was present in one oviduct but was not included in the count of 29 full-sized eggs. In addition to eggs, there were two distinct sets of enlarged ovarian follicles which measured ca. 15 mm (N = 16) and 10–12 mm (N = 6) in diameter.

The number of full-sized eggs (29) is noteworthy in that the largest clutch reported for all species of *Trachemys* is 30 for *T. scripta callirostris* (Moll and Moll 1990. *In* Gibbons [ed.], Life History and Ecology of the Slider Turtle, pp. 152–161. Smithsonian Inst. Press, Washington, D.C.) and *T. s. elegans* (Tucker 1996. Herpetol. Rev. 27:142). The enlarged follicles suggest that this specimen could have produced an additional 1–2 clutches in 1988. Although *T. scripta* may produce 3 or more clutches per year (e.g., Moll and Moll 1990, *op. cit.*), multiple clutches in *T. gaigeae* have not been reported previously.

We thank C. S. Pease, E. Jaquez, and A. H. Price for assistance.

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TRACHEMYS SCRIPTA ELEGANS (Red-eared Slider). **COLONIZATION.** The presence of freshwater turtles in landlocked aquatic habitats depends on colonization across land. Parker (1990 *In* Gibbons [ed.], Life History and Ecology of the Slider Turtle, pp. 216–222. Smithsonian Inst. Press, Washington, D.C.) studied colonization of a farm pond by *Trachemys scripta* and found that juveniles (45–90 mm plastron length [PL]) were the most frequent colonists. Here, we report an instance where hatchling (30-33 mm PL) *T. scripta* have colonized a farm pond.

One of us (JMH) has a small (ca. 0.04 ha) farm pond on his property, located in Oklahoma Co., Oklahoma, USA (35°41'11"N, 97°14'0"W). The pond is surrounded partially by a drift-fence with pitfall traps, and is isolated from other aquatic habitats by at least 500 m. Previous pitfall trapping, seining, hoop netting, funnel trapping, and observations at the study pond indicate that there were no resident turtles of any species prior to April 1996. Between April and June 1996, four hatchling *T. scripta elegans* were captured in the pitfall traps. The first three hatchlings were measured, marked, and released into the pond, whereas the last one was released into the pond without measuring or marking. The three that were meaured averaged 31.8 ± 1.16 mm PL. On 17 September 1996, we recaptured one of these hatchlings in the pond in a funnel trap baited with sardines. During the 147 days between captures this hatchling increased its PL by 14.7 mm, and more than tripled its mass (9.02–29.4 g).

The most likely explanation for this colonization is that a gravid female from a nearby pond nested close enough to the study pond to allow her hatchlings to disperse to the study pond following their emergence from the nest. Nesting migrations by freshwater turtles are common (Gibbons et al. 1990. *In* Gibbons, *op. cit.*, pp. 201–215). One function of these migrations might be to provide suitable natal habitat for emerging offspring (Congdon et al. 1987. Herptologica 43:39–54). Our observation provides evidence for such a function.

Submitted by **PAUL A. STONE** and **JOHN M. HRANITZ**, Department of Biology, University of Central Oklahoma, Edmond, Oklahoma 73034, USA.

SAURIA

ANOLIS CRISTATELLUS WILEYAE (Virgin Islands Crested Anole). **FRUGIVORY.** Anoles have long been known to eat fruit (Lazell 1972. Bull. Mus. Comp. Zool. 143:22–74) but the frequency and enthusiasm with which they do so have not often been documented. Here we report several instances of frugivory observed in the British Virgin Islands. On 5 October 1996 we watched an adult male crested anole consuming the sweet, magenta fruits of *Melocactus intortus* (Cactaceae) on Guana Island. Anoles caught during the fruiting season often defecate red or purple masses containing seeds. Previous studies of stomach contents conducted at this site have shown that fruits are not uncommon in anole stomachs (G. Perry, unpubl.; material deposited in the Texas Memorial Museum, Austin); however, this was our first observation of intentional ingestion at this site. On 11 October 1996 we observed a pair of crested anoles feeding in a patch of *Trichostigma octandra* (Phytolaccaceae) profusely in fruit with crimson berries. The fruits were about 50 cm above the ground in clusters. Access seemed to be a problem; although the anoles easily could have ridden these small, semi-vining herbs down, they did not. The female anole climbed down a small vine to consume as many berries as she could reach. The male (now Museum of Comparative Zoology 182075) attacked the berries from the edge of a large boulder. It ate all the berries it could reach, even to the extent of lunging out, disengaging its forefeet, and sprawling forward, retaining a grip on the rock only with its rear feet. When captured, this individual defecated *Trichostigma* seeds and skins in a red matrix. On dissection, the entire gut was packed with fruit.

We are indebted to Dr. George Proctor, Puerto Rico Department of Natural Resources, and Dr. Fred Kraus, Hawaii Division of Forestry and Wildlife, for identifying the plants.

Submitted by **JAMES LAZELL**, The Conservation Agency, 6 Swinburne St., Jamestown, Rhode Island 02835, USA, and **GAD PERRY**, Department of Zoology, Ohio State University, 1735 Neil Avenue, Columbus, Ohio 43210, USA.

ANOLIS STRATULUS (Saddled Anole). **NECTIVORY.** Nectar feeding has been recorded in anoles (Liner 1996. Herpetol. Rev. 27:78), but we believe it is far more commonplace and widespread than published records indicate. On 12 October 1996 we observed an adult male *Anolis stratulus* climbing on top of a shrub, *Pedilanthus tithymaloides* (Euphorbiaceae), on Guana Island, British Virgin Islands. The anole approached the shrub's flowers and proceeded to lick off drops of nectar that form on the tops of the flowers. This feeding behavior continued for over 10 min. The flowers are coral-red and the clear nectar is sweet to the taste.

We are indebted to Dr. Richard Howard, Gray Herbarium, Harvard, for confirmation of the plant's identity.

Submitted by **GAD PERRY**, Department of Zoology, Ohio State University, 1735 Neil Avenue, Columbus, Ohio 43210, USA, and **JAMES LAZELL**, The Conservation Agency, 6 Swinburne St., Jamestown, Rhode Island 02835, USA.

DRACAENA PARAGUAYENSIS (Paraguayan Caiman-lizard). **COURTSHIP.** The neotropical genus *Dracaena* (Sauria, Teiidae) contains two species of large-bodied lizards, both having diurnal, semiaquatic and semiarboreal habits, and known to feed mainly on freshwater snails (Vanzolini and Valencia 1966. Arq. Zool. 13:7–35).

Little information is available on the natural history of *D. paraguayensis* Amaral, which seems to be restricted to the seasonally flooded terrains of the Paraguay River basin, middle South America. Individuals of this species are seen commonly in selected wet habitats of the Pantanal wetlands, western Brazil (pers. obs.). Local inhabitants believe it to be venomous, as already noted by Amaral (1950. Copeia 1950:281–284), and refer to it as "bírbola" (a mis-pronounciation of the Portuguese word "víbora," which means viper).

On 27 January 1990, at 1005 h, at Santa Ines Ranch (ca. 16°30'S, 56°45'W) in the northern Pantanal, I found two *D. paraguayensis* interacting in shallow water (20 cm depth; 33.5°C water temperature). The lizards were discovered because of the loud puffs produced by one of them towards the other. I first heard the sound at a distance of about 7 m. As I approached, I could see them moving slowly among the dense aquatic vegetation (predominantly Pontederiaceae and Cyperaceae). It was evident that the puffs were being directed from a male to a female, as part of a courtship sequence. Movements then performed by the lizards may be summarized as follows: 1) Female moving continuously, at an approximate speed of 2 m/min; 2) Male following the female closely, sometimes trying to mount her. While moving, the male repeatedly puffed (about once each second), concomitantly inflating his dewlap. Occasionally, the male bit the female's tail at the base and lashed his own tail into the water; 3) When the female ceased locomotion, the male immediately positioned his body parallel, over and slightly behind relative to hers. The male then began to slide, from side to side, along the longitudinal axis of the female's body. Noisy puffs were produced repeatedly by the male during this phase too, presumably while mating; 4) The couple remained motionless for about 30 s, then moved away and out of my view.

Puffing behavior in courting lizards was known previously only for the genus *Tupinambis* (Carpenter and Ferguson 1977. *In* Gans and Tinkle [eds.], Biology of the Reptilia. Vol. 7, Ecology and Behavior A, pp. 335–554. Academic Press, New York) and was considered the most striking feature in the courtship of *T. teguixin* (Lopes 1986. Biologia reprodutiva e comportamento do teiu, *Tupinambis teguixin* (Linnaeus, 1758) em cativeiro (Reptilia, Teiidae). MsC thesis, Sao Carlos, 131 pp.). Most other behavioral units here reported as part of the courtship in *D. paraauayensis* are similar to those observed in *T. teguixin* by Lopes (*op. cit.*), except for tail lashing. On the other hand, I did not observe the frequent tongue protraction and mating and postmating behaviors of the kind described for *T. teguixin* (Lopes, *op. cit.*). It is possible that they also occur in the courtship of *Dracaena*, and that only a part of the entire courtship sequence of *D. paraguayensis* was witnessed by me.

Puffs sound different during courtship and as a defensive behavior (= "hiss", sensu Greene 1988. *In* Gans and Huey [eds.], Biology of the Reptilia. Vol. 16, Ecology B, pp. 1–152. Alan R. Liss, New York) in *T. teguixin* (Lopes, *op. cit.*). I also observed that, when attacked, *D. paraguayensis* produces more prolonged puffs in comparison with those produced during courtship.

The presence of courtship puffs in *Dracaena* and *Tupinambis* further emphasizes the close relationship between these two macroteiid genera, as suggested by Vanzolini and Valencia (*op. cit.*) and Presch (1974. Bull. So. California Acad. Sci. 73:23–32), based on morphological features.

I thank I. Sazima, A. S. Abe, and C. F. D. Rocha for helpful comments on an earlier version of the manuscript; B. L. Miranda for assistance in fieldwork, and O. Cid for facilities at the Santa Inês Ranch. Funds were provided in part by CNPq (grant 831105/89-5) and FEMA-MT (Fundação Estadual de Meio Ambiente, Mato Grosso). Fieldwork was conducted while I was a graduate student at UNICAMP (Universidade Estadual de Campinas, Sao Paulo).

Submitted by **CHRISTINE STRUSSMANN**, Rua Antonio Dorileo 508 apto. 34, 78085-600 Cuiaba, Mato Grosso, Brazil.

EUMECES SUMICHRASTI (NCN). **BROOD.** During the evening of 3 April 1992, a violent thunder and windstorm felled a large breadnut tree *(Brosimum alicastrum)* at the Caracol archaeological site (16°45'N, 89°7'W) in the Chiquibul National Park, Belize. The following morning, as the tree was being cut and sectioned for disposal, a clutch of eggs and an adult *Eumeces sumichrasti* were discovered in a cavity which would have been ca. 20 m above ground. This was considerably higher than nest sites described for *Eumeces fasciatus* (Cooper et al. 1983. Herpetol. Rev. 14:65–66) which were ca. 1 m above ground, with one nest as high as 10 m. The cavity containing the nest was located in a crotch formed by five branches. The cavity opening was 125 x 201 mm and was filled with coarse, rotting wood debris, similar to that described for *E. fasciatus* (Hecnar 1994. Canadian J. Zool. 72:1510–1516).

The presumed female (92 mm SVL; 190 mm total length; 18.0 g) and 11 eggs were recovered, apparently uninjured by the tree fall. This clutch size was slightly larger than the 5–10 observed for *E. fasciatus* by Cooper et al. (*op.* cit.). The eggs were distributed throughout the coarse woody debris; six were close to each other, buffered by debris and the remaining five were more widely scattered throughout the debris. Mean egg measurements were 15 x 11 mm and mean weight was less than 1 g.

The skink was relocated with six eggs and a handful of the woody debris to the crotch of another tree, ca. 1.5 m above ground, in adjacent tropical forest. It remained on top of the eggs in a loose semi-circular brooding position, reported as common in other species of *Eumeces* (Noble and Mason. 1933. Amer. Mus. Novitates 619). The remaining five eggs were scattered throughout a handful of the woody debris and placed in a plastic bag. The top of the bag was left loosely open to allow ventilation but retain moisture. The bag was placed in a shaded area in a camp hut. The skink was checked twice during the day of relocation. It remained with eggs in the new nesting location. The following day, the relocated nest was intact although the adult was absent.

On 9 April, four of the five eggs in the plastic bag hatched. The fifth egg appeared dry and later examination showed a less developed embryo with yolk sac. An examination of the relocated nest showed that all six eggs had apparently hatched, as evidenced by the remains of empty eggshells. The adult and hatchlings were not observed.

Mean measurements of the four captive hatchlings before release were as follows: 26 mm SVL; 70 mm total length; 0.67 g.

The base color of the hatchlings was black with vivid blue tails. The dorsal surface of the snout was marked with an orange diamond shape between the nostrils and an orange spot between the eyes. Three lines extended the length of the body, one from either nostril and the third from the diamond mark, passing through the interorbital spot. The three lines gradually shaded from orange on the head, to yellow to blue at the tail. A cream stripe extended laterally from the jaw, merging to blue at the tail. Ventral surfaces were cream except for the blue tail.

The Wildlife Conservation Society, Bowen & Bowen Ltd., and the Terra Foundation provided major project support during the time these observations were made. Permits to work at Caracol were obtained from the Forestry Department of Belize. I am grateful to S. Johnson of the Wildlife Conservation Society library for providing relevant literature. B. W. Miller provided field assistance and helpful comments. M. J. O'Farrell and J. R. Meyer reviewed an earlier version of the manuscript.

Submitted by **CAROLYN M. MILLER**, Wildlife Conservation Society, Gallon Jug, Belize.

MABUYA MACRORHYNCHA (NCN). **REPRODUCTION.** Data on the natural history of *Mabuya macrorhyncha* (Scincidae) are scare (Vanzolini and Rebouças-Spieker 1976. Pap. Avul. Zool. 29:95–109). On 17 October 1995, a female *M. macrorhyncha* was captured at Queimada Grande Island (24°29'S, 46°41'W), on the southeastern coast of Brazil. The lizard was maintained in a glass terrarium (35 x 20 x 25 cm) with a mixture of *Sphagnum* and plant debris as substrate. Water and direct sunlight were available, and the lizard was fed crickets and cockroaches. On 6 February 1996, the female (SVL = 76.0 mm) gave birth to three offspring (SVL = 33.0, 33.5, and 34.3 mm). The young appeared healthy and were able to eats small crickets and cockroaches some hours later.

Submitted by **ALEXANDRE P. ZANOTTI, SÁVIO S. SANT' ANNA**, and **JOÃO LUIZ D. LATUF**, Lab. Herpetologia, Instituto Butantan, Av. Vital Brazil 1500, 05503-900, São Paulo, Brazil.

PHRYNOSOMA CORNUTUM (Texas Horned Lizard). **GROWTH**. *Phrynosoma cornutum* is a Texas threatened species and a federal species of concern. However, information concerning the basic biology of *P. cornutum* is limited.

We marked and released *P. cornutum* from March 1991 to October 1994 on the Chaparral Wildlife Management Area (28°20'N, 99°30'W) in southern Texas, USA. Lizards were captured by road cruising, marked by toe-clipping and passive integrated transponders, and released at site of capture. Recaptures permitted the calculation of growth rates. Daily growth is reported as mm snout-vent length (mm SVL/day) between recaptures for each individual within the same year, and then averaged for juveniles and adults. Lizards between 50 and 75 mm SVL were classified as juveniles, and those > 75 mm SVL were considered adults. Growth rates for adult horned lizards during hibernation were calculated as the average mm SVL of lizards captured in late autumn (September and October) and recaptured in early spring (March and April) of the next year.

We collected 689 *P. cornutum* during the study. Of these, 42 lizards were captured on 98 occasions; 34 were captured twice, 4 were caught three times, 3 were captured four times, and 1 lizard was caught 6 times. Of those that were captured more than once, 3 were classified as juveniles and 39 were considered adults. We did not capture any lizards < 61 mm SVL. Mean growth of juveniles (1M:2F) was 0.527 mm SVL/day (SE = 0.230; N = 3). Mean growth for adults was 0.391 mm SVL/day (SE = 0.176; N = 40). There was no difference (t = -0.697; df= 38; $P = 0.490$) in growth rates between adult males and females (0.248 ± 0.086 mm SVL/day; N = 17 and 0.497 ± 0.300 mm SVL/day; N = 23, respectively). Fifteen adults (8M:7F) were captured in late autumn and recaptured in early spring of the next year (interval between measurements = 160–242 days). Mean growth of adults during hibernation was 0.036 mm SVL/day (SE = 0.010; N = 15).

We thank the personnel of the Chaparral WMA for their assistance with data collection. Financial assistance was provided by Texas Parks and Wildlife Department and the Horned Lizard Conservation Society.

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PHYLLODACTYLUS XANTI (Leaf-toed Gecko). **REPRODUCTION.** The purpose of this note is to report on a histological examination of gonads from 36 *P. xanti* from southern California, USA. Specimens were examined from the Natural History Museum of Los Angeles County (LACM), Museum of Vertebrate Zoology (MVZ), and San Diego Natural History Museum (SDSNH). Imperial County: LACM 52617, 93854–93856, 93858, 93860, 93863, 93865–93866, 93867–93870, 93872, 93874–93875, 99457, 125332, 126013. SDSNH 34725, 49879–49881, 58588, 58922, 62115. Riverside County: MVZ 71085. San Diego County: LACM 93876–93877, 93879, 14003,143743–143744. MVZ 72588, 98164. SDSNH 43786. The left gonad was removed and embedded in paraffin for histological examination. Sections were cut at 5 µm and stained with hematoxylin and eosin counterstain. Histology slides were deposited at LACM. My female sample (N = 18) had a mean SVL of 52.8 mm ± 2.5 SD (range 47–57 mm); male sample (N = 18) mean SVL = 50.3 mm ± 4.3 SD (range 42–56 mm). Testes were classified (sample size in parentheses) as to their spermatogenic state: regressed (spematogonia present, no spermatocytes); recrudescent (renewal of germinal epithelium with spermatocytes, but no sperm); spermiogenesis (sperm formation in progress); January (1) recrudescence; February (4) spermiogenesis; March (1) spermiogenesis; April (6) spermiogenesis; May (1) spermiogenesis; August (1) regressed; October (1) recrudescent; November (2) 1 recrudescent, 1 spermiogenesis; December (1) spermiogenesis. The smallest reproductively active male (spermiogenesis in progress) measured 42 mm SVL. The presence of November, December and February spermiogenic males raises the possibility that reproductive activity may commence in winter. Ovaries were classified (sample size in parentheses) as to their reproductive state: inactive (no yolk deposition); vitellogenic (yolk deposition in progress); enlarged follicles (> 3 mm diameter); oviductal eggs. February (1) inactive; March (1) inactive; April (5) 2 inactive, 3 vitellogenic; May (5) 1 inactive, 1 enlarged follicles, 3 oviductal eggs (1 egg in 1, 2 eggs in each of 2); September (2) inactive; October (2) inactive; November (1) inactive; December (1) inactive. The smallest reproductively active female (enlarged follicles) measured 49 mm SVL. The presence of oviductal females in May

(range 1–2 eggs) reconfirms previous reports (Behler and King 1988. The Audubon Society Field Guide to North American Reptiles and Amphibians, Alfred A. Knopf, New York, New York. 743 pp.; Stebbins 1985. A Field Guide to Western Reptiles and Amphibians, Houghton-Mifflin Co., Boston, Massachusetts. 336 pp.).

I thank Robert L. Bezy (Natural History Museum of Los Angeles County), Harry W. Greene (Museum of Vertebrate Zoology, University of California), and Gregory K. Pregill (formerly of the San Diego Natural History Museum) for permission to examine *P. xanti*.

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SERPENTES

AGKISTRODON CONTORTRIX CONTORTRIX (Southern Copperhead). **DIET**. Copperheads are known to feed on a variety of arthropod species, including moth caterpillars and cicada nymphs (Uhler et al. 1939. Trans. 4th North Amer. Wildl. Conf., pp. 605–622), dragonflies and millipedes (Brown 1979. Brimleyana 1:113–124), and mantids and grasshoppers (Hamilton and Pollack 1955. Nat. Hist. Misc. 140:1–4).

During the evening of 25 May 1996 I collected a male *Agkistrodon c. contortrix* (46.5 cm SVL) on County Road 119, 0.5 miles W of County Road 277, Jasper County, South Carolina, USA. On 2 June 1996 this snake disgorged a deeply-pleated light brown mass measuring 3.6 x 1.7 cm. Douglas Ferguson (USDA Systematic Entomology Laboratory) identified the mass as being the cocoon of a luna moth (*Actias luna*). Because the moth had not emerged (based on the lack of an opening and the presence of pupa remains within the cocoon), the most likely scenarios is that the snake consumed the cocoon, digested the contents, and disgorged the indigestible cocoon. The cocoon has been deposited in the entomology collection of the U.S. National Museum of Natural History.

Submitted by **CHUCK SMITH**, Department of Biology, The University of South Carolina, Columbia, South Carolina 29208, USA.

BOIGA IRREGULARIS (Brown Tree Snake). **INCUBATION and DIET.** *Boiga irregularis* is an exotic species on Guam that has been responsible for the extirpation or substantial reductions of Guam's forest birds (Savidge 1987. Ecol. 68:660–668), fruit bats (Wiles 1987. Pac. Sci. 41:148–157), and native lizard species (Rodda and Fritts 1992. J. Herpetol. 26:166–174). Despite intensive study, only one report of a successful incubation of a clutch of *B. irregularis* eggs has appeared in the literature (McCoid 1994. Herpetol. Rev. 25:69–70). We report here on the successful incubation of a second clutch on Guam and the diet accepted by the hatchlings.

On 18 May 1995 a *B. irregularis* (1.7 m total length) captured on Andersen Air Force Base deposited a clutch of 8 adherent eggs. Three of the eggs shriveled within a few days of deposition. The remaining 5 eggs were incubated at ambient temperature (ca. 25–30°C) and humidity (>95%) in a glass terrarium using slightly moistened casuarina needles (*Casuarina equistefolia*) as a substrate. After 74 days (31 July 1995), an egg that was discolored was opened, revealing a well-formed, live embryo 142 mm total length. After 120 days the eggs became noticeably dimpled (17 September 1995). The remaining 4 eggs pipped and the 4 snakes emerged on 21–22 September 1995 (125–126 days incubation period). This incubation period was 31–32 days longer than the 94 days reported by McCoid (1994, *op. cit.*).

We maintained two hatchlings (397 and 402 mm total length) in captivity. Three species of geckos, *Leptodactylus lugubris, Hemidactylus frenatus*, and *Gehrya mutilata*, were offered to the snakes, but only *L. lugubris* between 25–30 mm SVL were consumed. Size is apparently the basis for this selectivity, as we have not found juvenile *H. frenatus* or *G. mutilata* as small as 25–30 mm SVL and specimens of *L. lugubris* exceeding 30 mm SVL were not consumed. We also presented the snakes with small grasshoppers (25 mm total length), and on four occasions, they were consumed. A larger praying mantis (50 mm) was also offered, but not consumed. To our knowledge, this is the first record of *B. irregularis* on Guam deliberately consuming insects. Savidge (1988. J. Herpetol. 22:275–282) concluded that the insects (all <10 mm total length) found in larger *B. irregularis* (>600 mm SVL) resulted from incidental intake through consumption of lizards. However, our observations suggest a possible role for insects as prey for small *B. irregularis*. In some situations, control and containment efforts for *B. irregularis* involving prey base reductions may have to consider this previously unrealized prey item for young snakes.

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BOTHROPS PRADOI (Prado's Lancehead). **UNUSUAL MORTALITY.** Snakes sometimes take prey that are too large to swallow; such prey may be regurgitated (Sazima and Martins 1990. Mem. Inst. Butantan 52:73–79) or may kill the snake (Howard 1949. Copeia 1949:289; Godley 1980. Ecol. Monogr. 50:411–436). In July 1995, while walking in the restinga of Cumuruxatiba in southernmost Bahia State, Brazil (17°37'S; 39°33'W), one of us (RV) found a dead female *Bothrops pradoi* (61.5 cm SVL; 71 cm total length) on the ground. The snake had a partially ingested adult male (90 mm SVL; 22 mm maximum diam; 66 mm maximum circunference) collared lizard, *Tropidurus torquatus*, in its mouth. The lizard had been ingested head first, up to the anterior margin of the hind legs, and the mouth of the snake was greatly distended. Gape width of the snake was 19 mm after the lizard was removed.

In the laboratory, we carefully checked the snake's body under a stereomicroscope, but detected no sign of injury. We also examined a radiograph of the snake and found that its skull and spinal column were intact. We were not able to define the cause of the snake's death, but we cannot ignore the possibility of asphyxia. The snake was a small adult and the lizard was comparatively large, with strongly keeled and imbricated dorsal scales, which would make the lizard difficult to swallow or regurgitate.

We thank the personnel of the Image Service of the Hospital Pedro Ernesto/UERJ for the radiographs of the snake. Ivan Sazima and P. R. Manzani confirmed the identification of the snake. The former also provided helpful comments on the manuscript. CFDR benefited from a research grant (process No.300819/94-3) from the Conselho Nacional do Desenvolvimento Científico e Tecnológico (CNPq).

Submitted by **CARLOS FREDERICO D. ROCHA, HELENA G. BERGALLO, DAVOR VRCIBRADIC**, Setor de Ecologia, Instituto de Biologia, Universidade do Estado do Rio de Janeiro, Rua São Francisco Xavier 524, Maracanã, 20550-011, Rio de Janeiro, RJ, Brazil and **ROBERT VÁMOS**, Instituto Jacarandá, Cumuruxatiba, Prado, Bahia, Brazil.

IMANTODES CENCHOA (Chunk-Headed Snake). **REPRODUCTION.** Reproductive aspects of *Imantodes cenchoa* are poorly documented. We report on a clutch of eggs and hatchlings from a snake captured in primary forest in the Amazonian region (Reserva Extrativista do Alto Juruá, Acre, Brazil; 8°59'S, 72°43'W). At 0700 h on 25 January 1996, a female *I. cenchoa* (ZUEC 1922; 634 mm SVL; 910 mm total length [TL]) was collected on shrubs (1 m height) and subsequently maintained in a terrarium. This female laid two eggs (36.0 and 36.5 mm long; both 15.0 mm wide), one each on 26 and 27 January. The eggs were removed and incubated in a plastic jar with moist vermiculite. After 74 days (daily temperature range 25–31°C; ca. 90% humidity), both eggs hatched. Hatchling data: ZUEC 1936, 245 mm SVL; 340 mm TL; ZUEC 1937, 242 mm SVL; 335 mm TL; both weighed 2 g. The specimens are in the collection of the Museu de História Natural, Universidade Estadual de Campinas (ZUEC).

We thank I. Sazima and Emygdio L. A. Monteiro Filho for comments on the manuscript.

Submitted by **PAULO ROBERTO MANZANI** and **ADÃO JOSÉ CARDOSO**, Departamento de Zoologia, CP 6109, Instituto de Biologia, Universidade Estadual de Campinas, 13083-970, São Paulo, Brazil.

PHILODRYAS PATAGONIENSIS **(NCN). DIET.** *Philodryas patagoniensis* is a semi-arboreal species that occurs in a variety of habitats in Brazil, Bolivia, Paraguay, Argentina and Uruguay (Peters and Orejas-Miranda 1986. Catalogue of the Neotropical Squamata. Part I - Snakes, 2nd ed. Smithsonian Inst. Press, Washington, 174 pp.). Records of the food and foraging behavior of this snake in the wild are scarce (Sazima and Haddad 1992. *In* Morellato (ed.)., História Natural da Serra do Japi, pp. 212–236. Editora da Unicamp/Fapesp, Campinas; Vanzolini 1948. Rev. Brasil. Biol. 8:308–311). Here we report our records of a mammal, a lizard, and nestling birds taken as food in the wild by *P. patagoniensis* in restinga habitat of Barra de Maricá (22°57'42"S, 42°51'35"W), ca. 38 km E of Rio de Janeiro, Brazil.

On 13 January 1996 (0630 h) two of us (LPG and GDAC) found an adult female *P. patagoniensis* resting ca. 80 cm above ground, stretched on the branches of a scrubby thicket. The snake showed a remarkable volume in its body, and we suspected that it might have eaten a bird from a nearby nest, so we collected it for analysis of stomach contents. Dissection revealed that the snake had ingested a sub-adult *Metachirus nudicaudatus* (brown four-eyed opossum; Didelphidia, Marmosidae). The prey had been swallowed head-first and was nearly intact (Fig. 1). The snake measured 82 cm SVL (113 cm total length), and weighed 202 g (excluding the prey). The prey weighed 112 g immediately after being removed from the snake's stomach. Also found in the digestive tract of the snake were the tail and forelimb of a scincid lizard, *Mabuya agilis*. These specimens were deposited in the Department of Vertebrates of the Museu Nacional do Rio de Janeiro (snake and lizard (MNRJ 4739), opossum (MN 43077)).

Predation on bird nestlings occurred on 19 January 1995 (midday), and involved a widespread bird species, *Coereba flaveola* (bananaquit; Passeriformes, Emberezidae). On this occasion, LPG and GDAC were attracted by the calls of nestling *C. flaveola* to a nest ca. 90 cm above ground among thorns in the bifurcation of an isolated cactus in a small clearing. A *P. patagoniensis* had its head and neck inside the globular nest. As the snake moved a little, the corpse of a young bird dropped from the nest. The snake held another nestling in its mouth. The snake carried this dead nestling as it descended to the ground and moved into the nearest thicket, but let it fall midway to the thicket. Another young bird survived the attack, apparently not injured, and remained in the nest.

None of these prey species previously have been reported in the diet of *P. patagoniensis*.

We thank Carlos F. D. Rocha, Bret M. Whitney, Leila M. Pessoa, Richard Sachsse, Rui Cerqueira, Sérgio P. C. e Silva, and Ulisses Caramaschi for commenting on this note and providing additional information. The snake was identified by Ulisses Caramaschi, the opossum by João Alves de Oliveira, and the lizard by Carlos F. D. Rocha. Érika F. Pereira helped in field work. Maria A. S. Alves benefited from a research grant (process no. 301524/88-2) provided by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

FIG. 1. *Philodryas patagoniensis* and its prey, *Metachirus nudicaudatus*. Photo by M. A. S. Alves.

Submitted by **LUIZ A. P. GONZAGA**, Departamento de Zoologia, CCS, Universidade Federal do Rio de Janeiro, Cidade Universitária, 21941, Rio de Janeiro, RJ, Brasil, **GLÓRIA D. A. CASTIGLIONI**,* Programa de Pós-Graduação em Ecologia, Universidade Estadual de Campinas, Campinas, SP, 13081, Brasil, and **MARIA ALICE S. ALVES**, Ecology Sector, Universidade do Estado do Rio de Janeiro, R. São Francisco Xavier, 524, Rio de Janeiro, RJ, 20550-013, Brasil.

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TANTILLA PLANICEPS (California Black-headed Snake). **PREDATION.** At ca. 1900 h on 15 May 1982, I observed an adult loggerhead shrike (*Lanius lucovicianus*) with a juvenile *Tantilla planiceps* in its beak. The shrike was perched on the top strand of a barbed-wire fence that paralleled a road. The snake was moving, indicating it had been captured recently. The observation was made with 10x binoculars and lasted 5–10 s, after which the bird flushed. Field conditions were clear, calm, and warm. The habitat was grassland along Corral Hollow Road, Alameda Co., California, USA, 0.7 road mile W of the Alameda-San Joaquin Co. line.

Loggerhead shrikes eat invertebrates and small vertebrates (Peterson 1961. A Field Guide to Western Birds. Houghton Mifflin Co., Boston, Massachusetts, 309 pp.). This record may represent the first published account of a loggerhead shrike preying upon *Tantilla* (C. R. Mahrdt, unpubl. data).

I thank Robert Hansen for reviewing this note and Clark Mahrdt for sharing his extensive knowledge on the diet of the loggerhead shrike.

Submitted by **ED ELY**, Field Associate, Department of Herpetology, California Academy of Sciences, Golden Gate Park, San Francisco, California 94116, USA.

GEOGRAPHIC DISTRIBUTION

Instructions for contributors to Geographic Distribution appear in Volume 28, Number 1 (March 1997).

CAUDATA

AMBYSTOMA BARBOURI (Streamside Salamander). USA: TENNESSEE: Davidson Co: Nashville, Green Hills area, stream near Hillsboro High School. 5 March 1967. David H. Snyder. Austin Peay State University Museum of Zoology (APSU 1969). Verified by William H. Redmond. Non-gravid, adult female (SVL 73 mm); Jackson Co: Hix Hollow. 3 March 1973. T. Florence. Middle Tennessee State University Herpetological Collection (MTSU 326C, 327C). Verified by David H. Snyder. Juveniles (SVL 40 mm and 45 mm); Rutherford Co: ca. 1.1 km south of Tenn. Rt. 96 in field east of Rucker Lane. 2 October 1996. M. Brown. Middle Tennessee State University Herpetological Collection (MTSU 325C). Verified by David H. Snyder. Juvenile (SVL 44 mm). Originally identified as *Ambystoma texanum*, these specimens (reidentified based on tooth morphology and internaral distance) represent the first records of *A. barbouri* from Tennessee (Redmond and Scott 1996, Atlas of Tennessee Amphibians. Center for Field Biol. Austin Peay St. Univ. Misc. Pub. No. 12. 94 pp.) and extend the known range of the species ca. 170 km SW from Russell County, Kentucky (Kraus and Petranka 1989, Copeia 1989:94–110) into the Central Basin physiographic region of Tennessee. Redmond's and Scott's (*op. cit.*) Davidson and Jackson county records for *A. texanum* are therefore invalid and should be deleted from their Tennessee distribution map for this species.

Submitted by **A. FLOYD SCOTT**, Department of Biology and Center for Field Biology, Austin Peay State University, Clarksville, Tennessee 37044, USA, **BRIAN T. MILLER** and **MATTHEW BROWN**, Department of Biology, Middle Tennessee State University, Murfreesboro, Tennessee 37132, USA, and **JAMES W. PETRANKA**, Department of Biology, University of North Carolina at Ashville, North Carolina 28804, USA.

HEMIDACTYLIUM SCUTATUM (Four-toed Salamander). USA: GEORGIA: Marion Co: 16 km SW Buena Vista (32°10'N, 84°35'W). 8 January 1997. Bob Herrington. Georgia Southwestern State University Vertebrate Collection 6375. Verified by Marilyn Herrington. County record; represents a 150 km range extension from the nearest record in Decatur County, Georgia (Conant and Collins 1991, Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America. Third Ed. Houghton Mifflin Co., Boston, Massachusetts. 450 pp). Specimen is one of three collected by drift fences placed in a hardwood, floodplain forest bordering the Kinchafonnee Creek.

Submitted by **BOB HERRINGTON**, Department of Biology, Georgia Southwestern State University, Americus, Georgia 31709, USA.

HEMIDACTYLIUM SCUTATUM (Four-toed Salamander). USA: NORTH CAROLINA: Stokes Co: 4 km W Prestonville along Snow Creek. 11 April 1997. Dennis W. Herman, Jeffrey C. Beane, Ann B. Somers, and Robert A. Davis. North Carolina State Museum of Natural Sciences (NCSM color slides JCB 97-587). Verified by Alvin L. Braswell. Adult photographed and released at landowner's request and due to protected status in state. New county record; fills gap between Rockingham and Surry counties (NCSM files).

Submitted by **JEFFREY C. BEANE** and **DENNIS W. HERMAN**, North Carolina State Museum of Natural Sciences, P.O. Box 29555, Raleigh, North Carolina 27626-0555, USA.

HEMIDACTYLIUM SCUTATUM (Four-toed Salamander). GEORGIA: Burke Co: DiLane Wildlife Management Area. 22-28 April 1996. UGAMNH 32649-32652. Verified by M. E. McGhee and J. Jensen; Jones Co: Piedmont National Wildlife Refuge, 4.8 km NNW Headquarters. 29 August 1979. UGAMNH 15426. Verified by M. E. McGhee and J. Jensen; Piedmont National Wildlife Refuge, Little Falling Creek. 20 February 1980. UGAMNH 15246. Verified by M. E. McGhee and J. Jensen; Morgan Co: 0.8 km S US Rt. 278 on Co. Rd 164. 3 April 1980. UGAMNH File Record. Verified by L. J. Vitt and L. Logan; Putnam Co: Oconee National Forest, 0.5 km SW Rock Eagle Monument. 1 February 1997. UGAMNH 32423. Verified by M. E. McGhee and J. Jensen.

Submitted by **JOSHUA LAERM**, Museum of Natural History, University of Georgia, Athens, Georgia 30602, USA, **DENISE A. MAIDENS** and **LYNN LEWIS**, Daniel B. Warnell School of Forest Resources, University of Georgia, Athens, Georgia 30602, USA.

TARICHA GRANULOSA (Roughskin Newt). USA: IDAHO: Latah Co: private pond adjacent to S side of Four Mile Road, 3.5 km E Viola. 20 March 1997. Ryan J. Monello. Washington State University Charles R. Connor Museum (CRCM 97-17). Verified by Kevin Pullen. Specimen was collected from a reproducing population, 2.4 km NNE of only previous collection site (Nussbaum and Brodie 1971, Herpetologica 27:260–270). Prior to collection, only one specimen had been recorded in the past 23 years (Nussbaum et al. 1983, Amphibians and Reptiles of the Pacific Northwest. The University Press of Idaho, Moscow. 332 pp.). Two additional populations have been found in nearby private ponds. All three populations appear to be comprised of relatively few animals.

Submitted by **RYAN J. MONELLO** and **R. GERALD WRIGHT**, Department of Fish and Wildlife Resources, University of Idaho, Moscow, Idaho 83844-1136, USA.

ANURA

CHACOPHRYS PIEROTTI (Lesser Chini Frog): BOLIVIA: TARIJA: Provincia Gran Chaco: Villa Montes, 21°16'S, 63°28'W. 7–27 January 1981 and February 1982. H. Meier. Zoologisches Forschungsinstitut und Museum Alexander Koenig Bonn (ZFMK 32584, 36447). Verified by W. Böhme. First record for Bolivia (De la Riva 1990, Boll. Mus. Reg. Sci. Nat. Torino 8:261–319).

Submitted by **JÖRN KÖHLER**, Zoologisches Forschungsinstitut und Museum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany.

HYLA REGILLA (Pacific Treefrog). USA: CALIFORNIA: IMPERIAL CO: All American Canal near El Centro, 32°47'N, 115°36'W. elevation 11 m below sea level. 27 March 1959. J. Berry. LACM 144117–18. Verified by Kimball L. Garrett. Extends the range far into the Lower Colorado River Subdivision of the Sonoran Desert and to below sea level (Stebbins 1985, Peterson Field Guide to Western Reptiles and Amphibians. Second Ed. Houghton Mifflin Co., Boston, Massachusetts. 336 pp.). This new county record is ca. 85 km ESE of the previously reported locality at Scissors Crossing, San Diego County (Jameson et al. 1966, Proc. California Acad. Sci. 33:591) and ca. 115 km SE of the locality at Pushwalla Palms, Riverside County, California (Stebbins, *op. cit.*).

Submitted by **ROBERT L. BEZY**, Amphibians and Reptiles, Natural History Museum of Los Angeles County, Los Angeles, California 90007, USA, and **STEPHEN R. GOLDBERG**, Department of Biology, Whittier College, Whittier, California 90608, USA.

LEPIDOBATRACHUS LAEVIS (Budgett's Frog): BOLIVIA: TARIJA: PROVINCIA GRAN CHACO: Villa Montes, 21°16'S, 63°28'W. 23 February 1986. H. Meier. Zoologisches Forschungsinstitut und Museum Alexander Koenig Bonn (ZFMK 44733). Verified by W. Böhme. First record for Bolivia (Faivovich 1994, Acta Zool. Lilloana 43:105-115).

Submitted by **JÖRN KÖHLER**, Zoologisches Forschungsinstitut und Museum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany.

LITORIA AUREA (Green and Golden Bell Frog). TERRITORY OF WALLIS AND FUTUNA: WALLIS ('UVEA) ISLAND (13°18'S, 176°12'W). 19 December 1996. Helene Guegan, Jens V. Vindum. CAS 202722. Verified by Jens Vindum. First confirmed record for this French Pacific territory. Gill (1995, Rec. Auckland Inst. Mus. 32:55–61), who provided the first and only review of the herpetofauna of Wallis ('Uvea) Island, noted that frogs, "said to be the Australian species *Litoria aurea*" had been reported from several lakes on the island, but did not examine specimens or confirm this identification. Frogs were apparently introduced into Wallis ca. 1930 by Georges Renaud, a surgeon and French administrator, in order to control insects (Anonymous 1991, Au Pays des Trois Royaumes. Association Pacifique, Paris.). The geographic origin of the frogs is uncertain as Renaud had connections to Australia and the New Hebrides (Vanuatu), as well as to New Caledonia. However, the extensive political, economic, and transportation links between New Caledonia and Wallis strongly suggest that the animals originated there. New Caledonia has previously been proposed as the source for the subsequent introduction of *L. aurea* into Vanuatu (Tyler 1975, Copeia 1975:355–356).

Submitted by **AARON M. BAUER**, Department of Biology, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085-1699, USA, **ROSS A. SADLIER**, Department of Herpetology, Australian Museum, 6-8 College Street, Sydney, New South Wales 2000, Australia, and **JEAN CHAZEAU**, ORSTOM Centre de Nouméa, B. P. A5, Nouméa, New Caledonia.

PLEURODEMA TUCUMANA. ARGENTINA: JUJUY: PARQUE NACIONAL CALILEGUA, DEPARTAMENTO LEDESMA : Río Yuto (550 masl) 200 m from the Park border (23°50'S, 64°50'W) 9 January 1996. Marcos Vaira. Museo de Ciencias Naturales Universidad Nacional de Salta (MCN 347). Verified by E. O. Lavilla. Two males calling in the muddy shore of a temporary pond filled by rainwater. First province record; extends known range ca. 145 km N from former records in Joaquin V. Gonzalez, Salta [Cruz et al. 1992, Acta Zool. Lilloana 42(1):101–107]. First record for the species in a Subtropical Montane Forest.

Submitted by **MARCOS VAIRA**, Museo de Ciencias Naturales. Universidad Nacional de Salta, Mendoza 2, 4400 Salta, Argentina.

PSEUDACRIS TRISERIATA (Western Chorus Frog). USA: NEW MEXICO: CIBOLA CO: Pueblo of Laguna, 7.2 km N of Encinal, White Springs (SW 1/4 NW 1/4 Sec. 15, T11N, R6W), ca. 2330 m elev. 19 May 1997. S. E. Carr. University of New Mexico Museum of Southwestern Biology (MSB) 60771. Verified by Don S. Sias. Second record for San Mateo Mountains and confirms presence in this area of west-central New Mexico. Gehlbach (1965, Proc. U.S. Natl. Mus. 116:274) reported a specimen (CU 6338) from "Mark Elkin's Ranch, Mt. Taylor" (= Elkins Camp, Sec. 11, T12N, R7W) which was not mapped by Degenhardt et al. (1996, Amphibians and Reptiles of New Mexico. Univ. New Mexico Press, Albuquerque. xix + 431 pp.). Specimen provisionally assigned to *P. triseriata;* taxonomic status of New Mexico populations is unresolved.

Submitted by **STACEY E. CARR**, Department of Natural Resources, Pueblo of Laguna, P.O. Box 194, Old Laguna, New Mexico 87026, USA, **JAMES N. STUART** and **WILLIAM G. DEGENHARDT**, Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico 87131, USA.

TESTUDINES

CLEMMYS GUTTATA (Spotted Turtle). USA: WEST VIRGINIA: HAMPSHIRE CO: Edwards Run Wildlife Management Area (ERWMA), 3 km N Capon Bridge. 1992–1995. Three turtles were captured and released at ERWMA: an eight year old male (carapace length 99 mm) on 15 August 1992, an unknown age and sex adult turtle on 5 May 1992, and a five year old juvenile (carapace length 74 mm) on 17 September 1995. Photographs of these are catalogued in the West Virginia Biological Survey Collection at Marshall University (WVBS 10600). Verified by Thomas K. Pauley. Represents the first county record for this species and extends the known range in West Virginia 50 km W (Green and Pauley 1987, Amphibians and Reptiles in West Virginia, Univ. Pittsburgh Press. xi + 241 pp.).

Submitted by **ALLAN J. NIEDERBERGER**, West Virginia Division of Natural Resources, Romney, West Virginia 26757, USA, and **MICHAEL E. SEIDEL**, Department of Biological Sciences, Marshall University, Huntington, West Virginia 25755, USA.

CLEMMYS MUHLENBERGII (Bog Turtle). USA: NORTH CAROLINA: CHEROKKE CO: 4.8 km E Andrews. May 1988. J. M. Bauman. North Carolina State Museum of Natural Sciences (NCSM A.N. 95-8-15; specimen maintained in live collection). New county record; extends range ca. 14 km WNW of nearest records in Macon County (Palmer and Braswell 1995, Reptiles of North Carolina. Univ. North Carolina Press, Chapel Hill. 412 pp.). GRAHAM CO: 11.3 km ESE Robbinsville. July 1996. M. Hopey. NCSM 45684 (shell). New county record. Extends range ca. 18 km NW of nearest records in Macon County (Palmer and Braswell 1995, Reptiles of North Carolina. Univ. North Carolina Press, Chapel Hill. 412 pp.). Both verified by William M. Palmer.

Submitted by **DENNIS W. HERMAN** and **JEFFREY C. BEANE**, North Carolina State Museum of Natural Sciences, P. O. Box 29555, Raleigh, North Carolina 27626-0555, USA.

TRACHEMYS GAIGEAE (Big Bend Slider). USA: TEXAS: BREWSTER CO: Rio Grande at mouth of Reagan Canyon. 20 April 1997. W. G. Degenhardt, J. R. Dixon, M. Dixon, and M. E. Seidel. University of New Mexico Museum of Southwestern Biology (MSB) 60768–70 and a living specimen to be deposited in the Texas Cooperative Wildlife Collection (TCWC, field no. JRD 33425). Verified by James N. Stuart. Extends range downstream in the Rio Grande 37 km (airline) from its previously known limit at Rio Grande Village (near Boquillas) Brewster County, Texas (Ernst 1992, Cat. Am. Amphib. Rept. 538:1–14). *Trachemys gaigeae* was also collected along intermediate sites at the mouth of Maravillas and Big Canyons, indicating a continuous distribution along this portion of the Rio Grande downstream from Big Bend National Park.

Submitted by **MICHAEL E. SEIDEL**, Department of Biological Sciences, Marshall University, Huntington, West Virginia 25755, USA, **WILLIAM G. DEGENHARDT**, Department of Biology, University of New Mexico, Albuquerque, New Mexico 87131, USA, and **JAMES R. DIXON**, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas 77843, USA.

SAURIA

CHAMAELEO CHAMAELEON (Common Chameleon). PORTUGAL: ALGARVE: Lagos. 22 July 1994 (37°05'N, 08°41'W). SPAIN: ANDALUCA: Ayamonte. 1 August 1994 (37°15'N, 07°26'W); Torremolinos. 8 May 1994 (36°38'N, 04°30'W); Almuñecar. 12 September 1994 (36°43'N, 03°40'W). All specimens collected DOR. Department of Animal Biology and Ecology, University of Granada (AL 940721, adult female; HU 940801, adult male: MA 940508, adult male; GR 940912, adult male). All verified by J. M. Pleguezuelos. These records represent a considerable range extension of the species in the Iberian Peninsula, either as a continuous invasion, or as an interrupted but efficient incursion. This suggests that the *C. chamaeleon* has great adaptive plasticity. Efforts should be made for the conservation of this species in Europe.

Submitted by **MANUEL BLASCO**, Department of Animal Biology, University of Extremadura, 06071 Badajoz, Spain, and **DIEGO GONZALEZ**, Guadiana School, P.O. Box 147, Ayamonte, Huelva, Spain.

EUMECES BREVIROSTRIS INDUBITUS (Mexican Shortnose Skink). MEXICO: MICHOACAN: 6.8 km WNW Charán, 2286 m. 12 November 1970. Fred G. Thompson. UF 45523. Verified by F. Wayne King. First confirmed record for the state (the previous record was based on *E. dugesii* fide Dixon 1969, Los Angeles Co. Mus. Nat. Hist. Contr. Sci. 168:12), and the only record for the subspecies between western Mexico (state) and Jalisco and Durango (Robinson 1979, Los Angeles Co. Mus. Nat. Hist. Contr. Sci. 319:11). The specimen is an adult conforming in all respects with the distinctive characteristics of the subspecies.

Submitted by **DAVID L. AUTH**, Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA; **HOBART M. SMITH**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA, and **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 90309, USA.

EUMECES OCHOTERENAE (Guerreran Skink). MEXICO: OAXACA: San Vicente, Putla district. 1972. Thomas MacDougall. UCM 52640. Verified by Richard L. Holland. First record for the state of Oaxaca and a range extension of ca. 160 km ESE of the nearest records in central Guerrero (Dixon 1969, Los Angeles Co. Mus. Nat. Hist. Contr. Sci. 168:13, 19–20). No Notable differences are apparent in comparison with material from Guerrero, the only state of previous record.

Submitted by **HOBART M. SMITH**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA, **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309, USA, and **FRANK VAN BREUKELEN**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA.

HEMIDACTYLUS TURCICUS (Mediterranean Gecko). USA: LOUISIANA: NATCHITOCHES PARISH: 31°44'6"N, 93°5'54"W, ca. 0.1 km NE Northwestern State University. 8 March 1997. John Ray. Northwestern State University Museum (NSU 5260). Verified by Kenneth Williams. First record for Natchitoches Parish (Dundee and Rossman 1989, The Amphibians and Reptiles of Louisiana. Louisiana St. Univ. Press, Baton Rouge. 300 pp.; Harold Dundee, personal comm. 22 January 1997.; David Good, personal comm. 24 January 1997).

Submitted by **JOHN RAY** and **BETSY COCHRAN**, NSU Box 3153, Natchitoches, Louisiana 71497, USA. E-mail: nsray2796@alpha.nsula.edu.

OPHISAURUS COMPRESSUS (Island Glass Lizard). USA: GEORGIA: CAMDEN CO: Cumberland Island , interdune area east of Cedar Dock Road. 17 February 1993. C. Robert Shoop and Carol Ruckdeschel. USNM 511177. Verified by R. I. Crombie. In 1986, we noted the unconfirmed presence of several species listed by other authors as potential residents of Cumberland Island, Georgia (Herpetol. Rev. 17:51). This specimen establishes the presence of this species on the north end of the island. Another specimen, subsequently found dead in the same habitat, has been deposited in the Cumberland Island Museum. Although present in surrounding Georgia counties, these lizards represent the first Camden County records (Williamson and Moulis 1994, Distribution of Amphibians and Reptiles on Georgia. Savannah Sci. Mus. Spec. Publ. No. 3).

Submitted by **C. ROBERT SHOOP**, Department of Biological Sciences, University of Rhode Island, Kingston, Rhode Island 02881-0816, USA, and **C. RUCKDESCHEL**, Cumberland Island Museum, P.O. Box 796, St. Marys, Georgia 31558-0796, USA.

PRIONODACTYLUS ARGULUS. BRAZIL: ACRE: Rio Branco, Centro Experimental da Universidade Federal do Acre, Km 29 da AC-010 (10°03'S, 67°51'W). 17 March 1993. M. Henzl and L. Ford. Museu Paraense Emilio Goeldi (MPEG 16774). Verified by R. N. Yuki. First state record (Avila-Pires 1995, Zool. Verh. Leiden 299:458).

Submitted by **ALMIRA CLAUDIA MARINHO LIMA**, Departamento de Zoologia, Museu Paraense Emilio Goeldi, Caixa Postal 399, CEP 66.040-170, Belem, Para, Brazil. E-mail: claudia@museu-goeldi.br .

PRIONODACTYLUS EIGENMANNI. BRAZIL: ACRE: Rio Branco, Centro Experimental da Universidade Federal do Acre, km 29 da AC-010 (10°03'S, 67°51'W). 10 March 1993, Museu Paraense Emilio Goeldi (MPEG 16767–16768); 11 March 1993

(MPEG16770–16771); 17 March 1993 (MPEG 16773). All collected by M. Henzl and L. Ford. Verified by R. N. Yuki. First state records (Avila-Pires 1995, Zool. Verh. Leiden 299:468).

Submitted by **ALMIRA CLAUDIA MARINHO LIMA**, Departamento de Zoologia, Museu Paraense Emilio Goeldi, Caixa Postal 399, CEP 66.040-170, Belem, Para, Brasil. E-mail: claudia@museu-goeldi.br.

SAUROMALUS OBESUS (Chuckwalla). USA: NEVADA: ESMERALDA Co: on isolated rocky outcrop near Bonnie Claire Flat, 1260 m elev. (37°08.845'N, 117°10.925'W). 16 May 1995. Paul C. Ustach. PCU Field No. 188. New county record and northwest range extension. LINCOLN Co: Hell's Half Acre, Hiko Range, 1400 m elev. 27 April 1995. Paul C. Ustach. PCU Field No. 181. Northern range extension. Both verified by Edmund D. Brodie, Jr. Specimens eventually will be deposited at the University of Texas at Arlington.

Submitted by **PAUL C. USTACH**, Department of Biology, Utah State University, Logan, Utah 84322-5305, USA.

SCELOPORUS HORRIDUS OLIGOPORUS (Mexican Horrible Spiny Lizard). MEXICO: NAYARIT: 3.9 km NW Chapalilla, 1036 m. 21 May 1966. Fred G. Thompson. UF 34831. Verified by F. Wayne King. An adult male 95 mm SVL with 2-2 femoral pores and strong abdominal and gular semeions. First record for the state (Smith 1939, Zool. Ser. Field Mus. Nat. Hist. 26:99, 106–108), where the only representatives of the species previously recorded are *S. h. albiventris*, which apparently is replaced in the western, more elevated part of the state, by *S. h. oligoporus*.

Submitted by **DAVID L. AUTH**, Florida Museum of Natural History, University of Florida, Gainsville, Florida 32611, USA, **HOBART M. SMITH**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA, and **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309, USA.

SCELOPORUS PARVUS SCUTULATUS (Southern Bluebelly Lizard). MEXICO: ZACATECAS: 25.3 km SW San Tiburcio, 2316 m. 7 August 1966. Fred G. Thompson. UF 34975. Verified by F. Wayne King. First record of the species for the state, supplementing the northernmost record for the subspecies 48 km N Matehuala, San Luis Postosí (Smith 1939, Zool. Ser. Field Mus. Nat. Hist. 26:255–6, 284). With 22 nape rows, 69 dorsals, anterior section of frontal not divided.

Submitted by **HOBART M. SMITH**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA, **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309, USA; and **DAVID L. AUTH**, Florida Museum of Natural History, University of Florida, Gainsville, Florida 32611, USA.

SCELOPORUS UNDULATUS ELONGATUS (Nothern Plateau Lizard). USA: COLORADO: ROUTT Co: 1 km W Pagoda. 29 June 1997. Frank van Breukelen. UCM 58772. Verified by Richard L. Holland. First county record (Livo et al. 1996, Herpetological microbiogeography of Colorado II: documented and potential county records. Publ. Colorado Herpetol. Soc. 22 pp.) and a northeastern range extension of 42 km (airline) from the Yampa River south of Lay on the bluffs of the Williams Fork River.

Submitted by **FRANK VAN BREUKELEN,** Department of EPO Biology, University of Colorado, Boulder, Colorado 90309, USA, **JAN ROTH,** Sundance Museum, 417 Breeze Street, Craig, Colorado 81625, USA, **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309, USA and **HOBART M. SMITH**, Department of EPO Biology, University of Colorado Museum, Boulder, Colorado 80309, USA.

SCINCELLA LATERALIS (Ground Skink). MEXICO: DURANGO: ca. 14.5 km SSW Picardias, 1341 m (confirmed by field notes; 1400 ft. on tags in error). 28 December 1969. Fred G. Thompson. UF 105868–869. Verified by F. Wayne King. These represent an apparently isolated population ca. 7 km W of the Coahuila border, ca. 33 km (airline) SSW Torreón, Coahuila (Schmidt and Owens 1944, Zool. Ser. FMNH 29:107) at much the same altitude (1320 m). No notable differences were detected from U.S. material.

Submitted by **HOBART M. SMITH**, Department of EPO Biology and Museum, University of Colorado, Boulder, Colorado 80309-0334, USA, **DAVID L. AUTH**, Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA, and **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309-0345, USA.

SERPENTES

BOTHROPS NEUWIEDI (Neuwied's Lancehead). BRAZIL: AMAZONAS: HUMAITÁ: Savanna Region. G. R. Colli. Departamento de Zoologia, Museu Paraense Emílio Goeldi (MPEG 18951, 17 October 1991, MPEG 18954–55, 30 October 1991). Verified by G. Puorto. New county record (Campbell and Lamar 1989, The Venomous Reptiles of Latin America. Cornell Univ. Press, Ithaca, New York. 425 pp.). The Humaitá Region is an area between the main distribution of this snake and an isolated population (Campbell and Lamar, *op. cit.*).

Submitted by **RUBENS NOBUO YUKI**, Departamento de Zoologia, Museu Paraense Emílio Goeldi, Caixa Postal 399, Belém, Pará, Brazil CEP 66017-970.

CHIRONIUS FLAVOLINEATUS. BRAZIL: AMAZONAS: HUMAITÁ: Escola Agrotécnica de Humaitá (7°31'S, 63°02'W), 9 November 1991. Guarino R. Colli. Coleção Herpatológica da Universidade de Brasília (CHUNB 00217–18); AMAPÁ: FERREIRA GOMES: Fazenda Teinmoso (1°02'06"N, 51°10'02"), 17 April 1997. Guarino R. Colli and Ayrton K. Péres Jr. CHUNB 00219. All verified by Nelson Jorge da Silva Jr. First records for the states of Amapá and Amazonas; both in Amazonian Savanna habitats; extends range ca. 250 km NW from previous northern limit of distribution (Ilha de Marajó; Dixon et al. 1993, Monographie XIII, Museo Regionale di Scienze Naturali, Torino. 279 pp.) and ca. 800 km N of western limit of distribution (central Bolivia, ibid.).

Submitted by **GUARINO R. COLLI** and **AYRTON K. PÉRES JR.**, Departamento de Zoologia, Universidade de Brasília, 70910-900, Brasília, Distrito Federal, Brazil. E-mail (GRC): grcolli@guarany.cpd.unb.br.

CLELIA RUSTICA (Mussurana) ARGENTINA: MENDOZA: ca. 20 km SSE of Malargüe city (35°28'S, 69°35'W). 2 December 1992. Gustavo Marino. Herpetological collection of PROBBAS, Consejo Nacional de Investigaciones Científicas y Técnicas, Corrientes, Argentina (CFA 226, female). Verified by Gustavo Couturier. First province record; extends range ca. 440 km air line W from nearest known locality in Villa Valeria, Córdoba Province (Scrocchi and Viñas 1990, Boll. Mus. Reg. Sci. Nat. Torino 8(2):487–499).

Submitted by **ALEJANDRO R. GIRAUDO**, Becario de CONICET, Instituto Nacional de Limnología, José Macia 1933,

3016, Santo Tomé, Santa Fe, Argentina, and **VENESA ARZAMENDIA**, Salvador Caputto 3945, 3000, Santa Fe, Argentina.

COLUBER CONSTRICTOR FLAVIVENTRIS (Eastern Yellowbelly Racer). USA: TEXAS: McMULLEN Co: DOR at jct FM 624 and Tex. Rt. 16 on Tex. Rt. 16. 3 May 1997, Travis J. LaDuc and Christopher R. Harrison. TNHC 55958. Verified by David C. Cannatella. New county record (Dixon 1987, Amphibians and Reptiles of Texas. Texas A & M Univ. Press, College Station. 434 pp.).

Submitted by **TRAVIS J. LaDUC**, Department of Zoology, The University of Texas at Austin, Austin, Texas 78712-1064, USA and **CHRISTOPHER R. HARRISON**, Department of Wildlife and Fisheries Sciences, Texas A & M University, College Station, Texas 77843, USA.

CROTALUS VIRIDIS VIRIDIS (Prairie Rattlesnake). USA: WYOMING: SWEETWATER Co: 3.2 km W of Rt. 430 on road to Hiawatha. 27 June 1992. David Chiszar and Hobart M. Smith. UCM 57059. Verified by Alan de Queiroz. County record (Baxter and Stone 1980, Amphibians & Reptiles of Wyoming. Publ. Wyoming Game and Fish Department). Previously *C. v. concolor* was the only race of this species known from Sweetwater County.

Submitted by **KYLE G. ASHTON** and **HOBART M. SMITH**, Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA, and **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309, USA.

DIADOPHIS PUNCTATUS (Ringneck Snake). USA: ARIZONA: MOHAVE Co: 1 mi S of Oatman on U.S. Rt. 66. 29 April 1997. Paul C. Ustach and Daniel H. Foley. DHF Field No. 111. Verified by Edmund D. Brodie, Jr. Found dead on road. Specimen eventually will be deposited at the University of Texas at Arlington.

Submitted by **PAUL C. USTACH**, Department of Biology, Utah State University, Logan, Utah 84322-5305, USA.

DIADOPHIS PUNCTATUS (Ringneck Snake). USA: NEVADA: CLARK Co: Newberry Mountains, Hiko Spring, 630 m elev. (37°41'35"N, 85°22'33"W). 12 April 1995. Paul C. Ustach. PCU Photograph 005. Verified by Edmund D. Brodie, Jr. Individual was found stretched out in the middle of a dry wash about 400 m from the surface flow of Hiko Spring. Specimen eventually will be deposited at the University of Texas at Arlington.

Submitted by **PAUL C. USTACH**, Department of Biology, Utah State University, Logan, Utah 84322-5305, USA.

DIADOPHIS PUNCTATUS REGALIS (Regal Ringneck Snake). USA: TEXAS: EDWARDS Co: DOR, 10.2 road mi W Rocksprings on Tex. Rt. 55. 10 May 1997. Travis J. LaDuc. UTEP 17162. Verified by Carl S. Lieb. New county record (Dixon 1987, Amphibians and Reptiles of Texas. Texas A&M Univ. Press, College Station. 434 pp.); size of specimen (335 SVL + 60 mm tail length) suggests *D. p. regalis* instead of *D. p. arnyi.*

Submitted by **TRAVIS J. LaDUC**, Department of Zoology, The University of Texas at Austin, Austin, Texas 78712-1064, USA.

FARANCIA ERYTROGRAMMA ERYTROGRAMMA (Rainbow Snake). USA: FLORIDA: BAKER Co: south prong of the St. Mary's River at U. S. Rt. 90 and State Road 10 bridge, between Macclenny and Glen St. Mary. 16 June 1988. William H. Kern. Florida Museum of Natural History (UF 72535). Verified by F. Wayne King. County record; fills gap of ca. 70 mi between Duval and Columbia counties. NASSAU Co: 2 mi E of U. S. Rt. 17 on S shore of St. Mary's River, White Oak Plantation. 13 May 1997. Patrick J. Ryder. UF 106014. Verified by F. Wayne King. County record; fills a gap of ca. 70 mi between Glynn County (Georgia) and Duval County (Florida). First two records for the St. Mary's River drainage (Ashton and Ashton 1988, Handbook of Reptiles and Amphibians of Florida. Part One. The Snakes. Windward Publ., Miami. 176 pp.; Williamson and Moulis 1994, Savannah Sci. Mus. Spec. Pub. No. 2. 418 pp.).

Submitted by **DAVID L. AUTH**, Florida Museum of Natural History, University of Florida, Gainesville, Florida 32611, USA.

LAMPROPELTIS TRIANGULUM TRIANGULUM (Eastern Milk Snake). USA: ILLINOIS: KANE Co: 6 mi W Geneva. 16 May 1974. SE Sec. 31, T40N, R8E. Doug Brown. Museum of Northern Illinois University (HDW-NIU 1347). Verified by Jerry Stubbs. Specimen found crossing Rt. 38. Documents county record of Necker (1939, Chicago Acad. Sci. Bull. 6[1]:1–10) for which no voucher specimen is known.

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

LYSTROPHIS MATOGROSSENSIS (South American Hognose Snake). BOLIVIA: SANTA CRUZ: SANDOVAL: Estancia Cascavel (16°38'S, 57°29'W). 12 September 1994. Julio R. Contreras. Herpetological collection of PROBBAS, Consejo Nacional de Investigaciones Científicas y Técnicas, Corrientes, Argentina (CFA 725, male). Verified by Gustavo J. Scrocchi. First record for Bolivia; extends range ca. 100 km air line W from westernmost known locality in Caceres, Brazil. The species was known only from Mato Grosso and Mato Grosso do Sul states, Brazil (Scrocchi and Cruz 1993, Papeis Avulsos Zool. 38:171–186).

Submitted by **ALEJANDRO R. GIRAUDO**, Becario de CONICET, Instituto Nacional de Limnología, José Macia 1933, 3016, Santo Tomé, Santa Fe, Argentina.

NERODIA SIPEDON PLEURALIS (Midland Water Snake). USA: TENNESSEE: SHELBY Co: Germantown, SE margin of pond adjacent to Wolf River, 0.2 km E of Germantown Parkway, 35°07'N, 89°48'W. 9 May 1997. MSUMZ Color Slide R-1133. Verified by William H. N. Gutzke. Extends species range to southwestern Tennessee (Morris, 1987, Systematics and Distribution of the Northern Water Snake, *Nerodia sipedon* [Linnaeus], with Comparisons to *Nerodia fasciata* [Linnaeus], Ph.D. Dissertation, Southern Illinois University, Carbondale). Range extension supported by Hassell's records (1961, A Herpetological Survey of Shelby Forest State Park. Masters Thesis, University of Memphis) in Shelby County and Norton's records (1971, The Herpetofauna of Hardeman County, Tennessee. Masters Thesis, University of Memphis) in Hardeman County. Logan's records (1969, A Survey of the Herpetofauna of De Soto County, Mississippi. Masters Thesis, University of Memphis) in DeSoto County suggest that the species also may occur in extreme northwestern Mississippi.

Submitted by **STEPHEN J. MULLIN**, Department of Biology, University of Memphis, Memphis, Tennessee 38152, USA, and **JAMES T. EUBANKS**, 4930 Verne Memphis, Tennessee 38117, USA.

OXYRHOPUS RHOMBIFER INAEQUIFASCIATUS (Falsa Coral, False Coral Snake). ARGENTINA: CORRIENTES: Corrientes: Captial. (27°35'S, 58°45'W). 4 December 1996. Laura Rey. Colección Herpetológica de la Universidad Nacional del Nordeste, Corrientes, Argentina (UNNEC- 05156). Verified by Gustavo Scrocchi. First province record (Cei 1993, Monograf. XIX . Mus. Reg. Sci. Nat. Torino).

Submitted by **LAURA R. REY**, Departamento de Herpetología, CEPSAN, Avenida Costanera 255 (3400) Corrientes, Argentina, and **MARIA LUISA LIONS**, Cátedra de Anatomía Comparada, Facultad de Ciencias Exactas y Naturales y Agrimensura, UNNE, 9 de Julio 1449, (3400) Corrientes, Argentina.

PSEUSTES SULPHUREUS. BRAZIL: SÃO PAULO: PARANAPIACABA (23°48'S, 46°03'W). August 1974. Collector unknown. Museo de Zoologi da Universidade de São Paulo (MZUSP 5622). Verified by Paulo E. Vanzolini. Species normally is found in Amazonian and Atlantic Forest. First state record; the southern limit of its range was reported previously as Maricá, RJ (22°57'S, 42°49'W) (Peters and Orejas-Miranda 1970, Bull. U.S. Nat. Mus. 297:259).

Submitted by **OTAVIO A. V. MARQUES** and **MYRIAM E. CALLEFFO**, Laboratório de Herpetologia, Instituto Butantan. Avenida Vital Brasil, 1500, CEP 05503-900, São Paulo, São Paulo, Brazil.

RHINOTYPHLOPS PRAEOCULARIS. NIGERIA: GONGOLA: Adamawa: Yola, 09°12'N, 12°29'E, ca. 500 m. Zoological Museum, University of Copenhagen (ZMUC R52197). Verified by V. Wallach. A rare species; only 12 specimens known, as follows: S Congo (Brazzaville, MNHN 1986.730), SW Zaire (vic. of Kisangani, USNM 20799, LACM 49690-93), NE Angola (Dundo, MD 5252, 5959, 5932, 5935, 5938), and "West Africa" (unknown locality, FMNH 75088). Adult female, 24 scale rows, 545 middorsals. First record for Nigeria and range extension of ca. 1500 (airline) km N of Brazzaville (Roux-Esteve 1974, Mem. Mus. Natn. Hist. Nat. 87A:1–313).

Submitted by **JENS B. RASMUSSEN**, Zoological Museum, University of Copenhagen, Universitetsparken 15, DK-2100 Copenhagen Ø, Denmark.

TANTILLA CALAMARINA (Pacific Coast Centipede Snake). MEXICO: PUEBLA: 12.5 km SE Izucar de Matamoros, 1475 m (18°31'16"N, 98°24'59"W), on a microwave tower hill under a limestone boulder in xeric scrub thicket. 21 February 1992. Fred G. Thompson. UF 102793. Verified by F. Wayne King. First verified and credible record for the state (Wilson 1988, Cat. Am. Amph. Rept. 433:1–2). A record for Teziutlan, Puebla (Cope 1885, Proc. Am. Philos. Soc. 22:381), is neither verifiable (specimen lost) nor credible (geographically inconsistent), and was for those reasons rejected by Wilson (*loc. cit.*).

Submitted by **HOBART M. SMITH,** Department of EPO Biology, University of Colorado, Boulder, Colorado 80309, USA, **DAVID CHISZAR**, Department of Psychology, University of Colorado, Boulder, Colorado 80309, USA, and **DAVID L. AUTH**, Florida Museum of Natural History, University of Florida, Gainsville, Florida 32611, USA.

THAMNODYNASTES HYPOCONIA (House Snake). ARGENTINA: SANTA FE: DEPT. GENERAL OBLIGADO: Villa Ocampo. (28°39'S, 59°20'W). 26 March 1997. P. M. Cacivio. Verified by R. H. Aguirre. Coleccion Herpetologica de la Facultad de Ciencias Exactas y Naturales y Agrimensura: (UNNEC 5194–95, females). First province records; confirms presumed distribution and extends known range at least 60 km S (Bergna and Alvarez 1993, FACENA 10:5–13; Cei 1993, Monogr. XIV. Mus. Reg. Sci. Nat. Torino: 695; Williams and Francini 1991, Mus. Reg. Nat. Sci. Nat. Torino 9(1):55–90).

Submitted by **PEDRO MATIAS CACIVIO**, Facultad de Ciencias Veterinarias, Universidad Nacional del Nordeste, Jose Marmol 243, CP 3400, Resistencia, Chaco, Argentina.

New Records and Natural History Notes for Lizards from Northwestern Argentina

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Field work in northwestern Argentina during the austral summer of 1995 resulted in significant new records for five species of *Liolaemus*—three of them recently described members of the *darwinii* complex—and for one species of *Pristidactylus*. The identities of all specimens were verified by Fernando Lobo. Voucher specimens have been deposited at San Diego State University (SDSU) or the Fundación Miguel Lillo (FML). Latitude, longitude, and elevation were determined with a Scout™ global-positioning device (Trimble Navigation Systems, Sunnyvale, California, USA).

Tropiduridae

Liolaemus cuyanus (NCN). LA RIOJA PROVINCE: Dpt. Gral. Lavalle, 42 km SW of Villa Unión on Ruta Nac. 40 (29°30'59"S, 68°30'51"W, 1050 m). 19 January 1995. SDSU 3435. An adult female was found basking on a rock along the road. The previous westernmost records are from 67°41'51"W in southern San Juan Province, and 67°38'0"W in southwestern Catamarca Province. This record constitutes a range extension of ca. 140 km west for the species and provides support for Cei's (1993) contention that this species is distributed throughout most of the non-Andean regions of this province. The substratum was one of loose sand with smooth stones and small boulders, but lacking dunes or extensive areas of open sand.

Liolaemus koslowskyi (NCN). LA RIOJA PROVINCE: Dpt. Gral. La Madrid, 10.8 km N of Villa Castelli on Ruta Prov. 26 (28°55'50"S, 68°11'11"W, 1410 m). 18 January 1995. SDSU 3597. This is the second record for this species from the valley of the Río Vinchina; extends the known range ca. 50 km north of the previously reported westernmost record (Etheridge 1993). Of greater significance, however, is the discovery of *Liolaemus olongasta* to the north (see below).

Liolaemus laurenti (NCN). LA RIOJA PROVINCE: Dpt. Independencia, sand dunes 51 km W of Patquia on Ruta Prov.

150 (30°12'21"S, 67°20'27"W, 900 m). 8 February 1995. SDSU 3475–76. Extends the range about 35 km east of Baldecitos, San Juan Province; SAN JUAN PROVINCE: Dpt. Caucete, sand dunes 4 km W of Bermejo on Ruta Nac. 210 (31°36'05"S, 67°41'51"W, 690 m). 9 February 1995. FML 3452(6). This locality extends the range ca. 260 km south of Baldecitos, which was previously the most southerly record (Etheridge 1992). All records for this species are from sand flats or dunes. The absence of records from the intervening region may be due to the fact that the only road connecting the two localities passes to the east of the Sierra del Valle Fértil and the Sierra de la Huerta where sandy habitats are absent. *Liolaemus laurenti* may occur on the scattered sand dunes of the great valley of the Río Bermejo that lies west of these ranges, but has eluded detection because there are no roads to access this area.

Liolaemus olongasta (NCN). LA RIOJA PROVINCE: Dpt. Vinchina, sand dunes just W of the jct. of Ruta Prov. 16 and road spur to Bajo Jagüé (28°39'26"S, 68°20'11"W, 1790 m). 18 January 1995. FML 3454 and SDSU 3544–47. This site is ca. 135 km north of the type locality, which was previously the most northerly record for this species (Etheridge 1993). Individuals were observed only on sand dunes. The dunes were surrounded by rocky ground where no other *Liolaemus* were seen. Etheridge (1993) noted the existence of a small series of *L. olongasta* recorded from "Jagzuél, al pie de la Cordillera," but the province was not specified. Given this new record, it is likely that the previously ambiguous locality may refer to either Alto Jagüé or Bajo Jagüé. The dunes are located near an upper tributary of the Rio Vinchina, ca. 35 km north of the most northerly record in this valley for *L. koslowskyi* (reported above). Thus, the distribution of *L. koslowskyi* appears to be interposed between that of *L. olongasta* on the dunes of Bajo Jagli in the north, and on the sand flats of Talampaya south of Villa Unión. Several of the females we collected in this region were gravid and exhibited bright yellow coloration along their posterior jaws. This suggests the presence of gravid female coloration in *L. olongasta;* SAN JUAN PROVINCE: Dpt. Jáchal, gravel flats 28.1 km E of Rodeo on Ruta Prov. 150 (30°12'40"S, 68°53'07"W, 1350 m). 19 January 1995. SDSU 3613–16. While specimens from this locality (between Rodeo and San José de Jáchal) do not represent a range extension, they are noteworthy because of their color pattern and the substratum upon which they were found. Although Etheridge (1993) had noted records for *L. olongasta* from San Juan Province, he had only observed this species on the Talampaya sand flats of western La Rioja Province. The dorsal color pattern exhibited by *L. olongasta* that live on sand is remarkably cryptic [e.g., individuals from the dunes near Bajo Jagüé and the Talampaya flats (Etheridge 1993, Pl. 2.4–5)]. In contrast, males from the gravel flats east of Rodeo have a darker, bolder pattern, with bright yellow dorsolateral stripes and numerous iridescent blue scales; SAN JUAN PROVINCE: Dpt. Jáchal, rocky flats 54 km NNE San José de Jáchal on Ruta Prov. 40 (29°57'24"S, 68°29'25"W, 1050 m). 21 January 1995. SDSU 3515. This record fills in a large gap between the type locality and the locality reported by Etheridge (1993) at 3 km northwest of San José de Jáchal; SAN JUAN PROVINCE: Dpt. Iglesia, gravel flats just N of Tocota on Ruta Nac. 141 (30°41'02"S, 69°26'38"W, 2550 m). 19 January 1995. Two hatchlings (26 mm SVL) that were collected, but subsequently lost, are apparently referable to this species and, if so, represent a range extension of ca. 70 km SSW of Rodeo.

Liolaemus pseudoanomalus (NCN). CATAMARCA PROVINCE: Dpt. Tinogasta, rocky flats 12.8 km S of Fiambalá on Ruta Prov. 45 (27°47'7"S, 67°39'40"W; 1470 m). 16 January 1995. SDSU 3540. This record extends the range reported for this species by Cei (1993) ca. 160 km northwestward into the valley of the Rio Abaucán. Etheridge (1993) noted that this species occurs here syntopically with *Liolaemus abaucan*, based on specimens from 8.2 and 8.8 km north of Fiambalá (SDSU 1310–11).

Polychrotidae

Pristidactylus scapulatus (NCN). SAN JUAN PROVINCE: Dpt. Iglesia, at the base of a small hill on rocky ground about 0.5 km S of Tocota, just E of Ruta Prov. 412 (30°41'2"S, 69°26'38"W, 2550 m). 20 January 1995. SDSU 3448. This locality is about half way between previous records for this species from the Cordillera de San Guillermo (3500 m) in extreme northwestern San Juan Province (Cei et al. 1983), and the Sierra de Uspallata (2520–2768 m) in extreme northwestern Mendoza Province (Cei and Roig 1976)—a distance of 400 km. The individual was an adult male that retreated into a rodent burrow (probably *Ctenomys* sp.) upon approach. In our experience, *P. scapulatus* is typically found in association with large boulders, but no such refugia were available in this area.

Acknowledgments.—We thank E. Lavilla, F. Lobo, J. C. Moreta, and S. Torres for invaluable field assistance. We are grateful to R. Laurent, M. Halloy, and R. Montero and their families for providing logistic support while in Tucumán. Lizards were collected under the authority of the Instituto de Herpetología, Fundación Miguel Lillo, Tucumán. Partial funding was provided to the junior author by the American Society of Ichthyologists and Herpetologists, the Chicago and San Diego Herpetological Societies, the Explorers Club, the Graduate Degree Program in Ecology at Colorado State University, and by generous contributions from the Burdett, Cousins, and Deaton families. This note was written while the junior author was supported by a Porter Fellowship from the American Physiological Society.

LITERATURE CITED

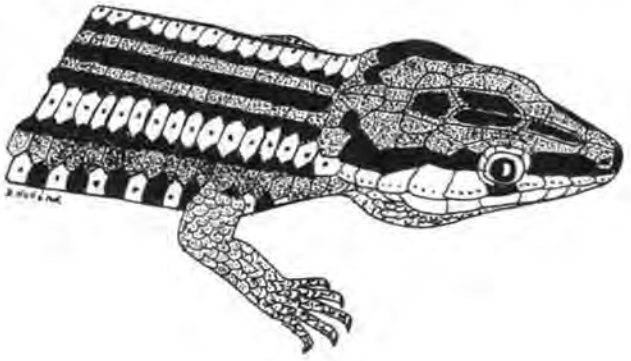
CEI, J. M. 1993. Reptiles del noroeste, nordeste y este de la Argentina. Monogr. Mus. Reg. Sci. Nat. Torino 14:1–949.

_____, R. ETHERIDGE, AND F. VIDELA. 1983. Especies nuevas de iguanidos del noroeste de la provincia de San Juan (Reserva Provincial San Guillermo), Argentina. Deserta (Mendoza) 7:316–323.

_____, AND V. G. ROIG. 1976. Fauna y ecosistemas del oeste árido Argentino. I. Reptiles de la Provincia de Mendoza. Deserta (Mendoza) 4:69–91.

ETHERIDGE, R. 1992. A new psammophilous lizard of the genus *Liolaemus* (Squamata: Tropiduridae) from northwestern Argentina. Boll. Mus. Reg. Sci. Nat. Torino 10:1–19.

_____. 1993. Lizards of the *Liolaemus darwinii* complex (Squamata: Iguania: Tropiduridae) in northern Argentina. Boll. Mus. Reg. Sci. Nat. Torino 11:137–199.



Snake Fauna of St. Catherines Island, Georgia

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St. Catherines Island, Liberty County, Georgia (USA), is a 56 km^2 (5,666 ha) barrier island situated 80 km south of Savannah, between Ossabaw and Sapelo islands. St. Catherines Island has been inhabited by humans for more than 4500 years (Larsen 1982) and has had an extensive cultural history (Thomas et al. 1978). As earlier studies of barrier island amphibians and reptiles (see Gibbons and Coker 1978) have shown, St. Catherines likewise has a depauperate herpetofauna (Zweifel and Cole 1974) compared with that occurring on the mainland. Certainly, Native American exploitation, followed by Spanish settlement, subsequent plantation agricultural activities and lumbering, and cattle and swine ranching, coupled with violent weather phenomena, impacted post-Pleistocene plant and animal colonizers and helped shape today's herpetofaunal elements.

Since 1970, the St. Catherines Island herpetofauna has been well scrutinized by zoologists from the American Museum of Natural History, New York University, Wildlife Conservation Society, Georgia Southern University, University of the South, Georgia Department of Natural Resources, and scores of visiting biologists from other institutions. Some twelve species of snakes are known from St. Catherines Island: *Nerodia fasciata, Thamnophis sirtalis, T. sauritus, Opheodrys aestivus, Coluber constrictor, Elaphe obsoleta, E. guttata, Cemophora coccinea, Lampropeltis getula, Agkistrodon piscivorus, Crotalus horridus,* and *C. adamanteus*. There have been no confirmed additions to Zweifel and Cole's (1974) list. Except for the natricines and *Coluber* and *Elaphe*, other species were not commonly seen before the mid-1980s. Large populations of feral hogs and cattle (both introduced in the 1930s) dramatically damaged and opened the understory and likely negatively impacted most resident snake populations. Since removal of the cattle (1975–1983) and suppression of the feral hogs (<100 adults 12/96), the understory has recovered, and snake observations have become more frequent.

In 1985, St. Catherines Island was evaluated as a potential release site for the endangered *Drymarchon couperi* by Dan Speake, Team Leader, Eastern Indigo Snake Recovery Plan. It was judged that suitable habitat existed and a plan was advanced to introduce the gopher tortoise (*Gopherus polyphemus*) to hold dune and savanna area on the north end of the island to enhance the "indigo snake" habitat. *Gopherus* has been introduced there, but no *Drymarchon* have been liberated.

On the basis of a 1983 photograph, Couper et al. (1996) reported a "confirmed" record of *Drymarchon couperi* from St. Catherines Island as the first such event for any barrier island. The photo was reported (to BW) to have been taken in the immediate vicinity of the student housing facilities during the senior author's visit to the island that year. One of us (RHH) recalls the photo event. Based upon examination of the developed photograph, habitat, and behavior of the snake in question, RHH in 1983 identified the snake as a racer (*Coluber constrictor*). Couper commented (to BW) that only one photograph (UCM Color Slide 114) was taken and the author provided the voucher slide to the University of Colorado Museum. UCM Color Slide 114 was the same photograph seen years earlier by RHH and clearly depicts a *Coluber constrictor*.

Many thousands of man hours have been devoted to the exploration of the fauna and flora of St. Catherines Island. Consequently, the herpetofauna is well known. It does not include the normally conspicuous and largest non-venomous snake species (*Drymarchon couperi*) in North America.

Acknowledgments.—Thanks are extended to David Chiszar for providing a duplicate copy of the voucher slide.

LITERATURE CITED

COUPER, J., D. CHISZAR, AND H. M. SMITH. 1996. Geographic distribution: *Drymarchon couperi*. Herpetol. Rev. 27:154.

GIBBONS, J. W., AND J. W. COKER. 1978. Herpetofaunal colonization patterns of Atlantic Coast barrier islands. Amer. Midl. Nat. 99(1):219–233.

LARSEN, C. S. 1982. The anthropology of St. Catherines Island: 3. Prehistoric human biological adaptation. Anthropol. Pap. Amer. Mus. Nat. Hist. 57(3):155–270.

THOMAS, D. H., G. D. JONES, R. S. DURHAM, AND C. S. LARSEN. 1978. The anthroplogy of St. Catherines Island: 1. Natural and Cultural History. Anthropol. Pap. Amer. Mus. Nat. Hist. 55(2):155–248.

ZWEIFEL, R. G., AND C. J. COLE. 1974. An annotated checklist of the amphibians and reptiles of St. Catherines Island, Georgia. Amer. Mus. Nat. Hist. Unpubl. report.

Status of Possible Disjunct Populations of the Southern Toad, *Bufo terrestris*, in the Piedmont and Blue Ridge of Georgia

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The status of disjunct populations of the southern toad, *Bufo terrestris* (Bonnaterre), in the Upper Piedmont and Blue Ridge physiographic provinces of South Carolina and Georgia, USA, is confused. Wright and Wright (1949, Handbook of Frogs and Toads of the United States and Canada. Comstock Publ. Assoc., Ithaca, New York. p. 199) questioned "are the isolated records (one, western South Carolina; one, northern Georgia)...misidentification or intermediates?" Martof et al. (1980, Amphibians and Reptiles of the Carolinas and Virginia. Univ. North Carolina Press, Chapel Hill. 264 pp.) do not indicate disjunct populations of *B. terrestris* in the Upper Piedmont or Blue Ridge of South Carolina. However, Blem (1979, Cat. Amer. Amph. Rept. 223.1–223.4.) and Conant and Collins (1991, Peterson Field Guide to Amphibians and Reptiles of Eastern and Central North America. Third Ed. Houghton Mifflin, Boston, Massachusetts. 450 pp.) correctly map disjunct records. Ostensibly, these are based on previously published records of Pickens (1927, Copeia 165:106–110), Burt (1938,

Trans. Kansas Acad. Sci. 41:331–366), and Chamberlain (1939, Charleston Mus. Leafl. 12:1–38), as well as museum records (United States National Museum and Charleston Museum) from portions of Anderson, Greenville, and Pickens counties. These include records from both Upper Piedmont and Blue Ridge physiographic provinces.

Insofar as we can determine, Wright and Wright (*op. cit.*) are the only authorities to have commented on the possibility of disjunct populations occurring in adjacent regions of Georgia. Williamson and Moulis (1994, Savannah Sci. Mus. Spec. Publ. 3:1–712) include in their locality data (but do not map) a single record of *Bufo terrestris* from Rabun County, Georgia (10 mi. NE Dillard) based on a University of Georgia Museum of Natural History record. The specimen had been cataloged and correctly identified as a *B. americanus*. Additionally, we searched museums in the United States with holdings of *B. terrestris* from Georgia. We examined six *B. terrestris* from the Blue Ridge in Rabun County (UMMZ 45876-45881). Our attribution of these specimens to *B. americanus* is confirmed by Alan Resetar. We also examined a *B. terrestris* (UMMZ 91963) from the Upper Piedmont of Lumpkin County, which is referable to *B. woodhousii fowleri* (confirmed by G. Schneider; see also Williamson and Moulis 1994.). We conclude that while extralimital populations of *B. terrestris* appear well established in the Upper Piedmont and Blue Ridge of South Carolina, there is no evidence of their occurrence in adjacent regions of Georgia. Populations in Georgia are restricted approximately to the Fall Line south as indicated in Conant and Collins (*op. cit.*) and Williamson and Moulis (*op. cit.*).

New County Records of Amphibians and Reptiles from Georgia

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Distribution records of the amphibians and reptiles of Georgia have been documented by Williamson and Moulis (1994) and additional records have been added by Laerm et al. (1996). However, distribution records for several Georgia counties are lacking, especially in the central part of the state. The Georgia College and State University Herpetological Collections hold numerous species that are the first records for counties. Identification of all specimens were verified by Dennis Parmley (unless otherwise noted), and are deposited in the GCSU comparative skeletal collection unless otherwise noted.

Desmognathus auriculatus (Southern Dusky Salamander). Hancock Co: 19.3 km S of Sparta. 23 April 1995. Dennis Maddox. GCSU 4238. Extends range 27 km north of nearest record in Wilkinson County.

Eurycea longicauda guttolineata (Three-lined Salamander). Spalding Co: no other data. 15 April 1990. Collector unknown. GCSU 2408.

Plethodon glutinosus (Northern Slimy Salamander). Jasper Co: 8.1 km SE of Monticello. 8 May 1991. Barry Hooper. GCSU 3630.

Bufo americanus (American Toad). Baldwin Co: Ivey-Weaver Road, 1.3 km E of North Jefferson Street, Milledgeville. 9 April 1991. D. Peck. GCSU 3612. Extends range southeast one county from Putnam and Jones counties.

Rana sphenocephala utricularius (Southern Leopard Frog). Baldwin Co: Lake Laurel Road, 6 km NE Milledgeville. 28 March 1991. Dennis Parmley. Verified by D. Walker. GCSU 3615. Completes county sequence in central Georgia.

Eumeces fasciatus (Five-lined Skink). Baldwin Co: Ivey-Weaver Road, 1.3 km E of North Jefferson Street, Milledgeville. 16 September 1992. David Peck. GCSU 3565. Fayette Co: Peachtree City. 23 March 1990. Dennis Parmley. Verified by D. Walker. GCSU 3701.

Eumeces inexpectatus (Southeastern Five-lined Skink). Baldwin Co: Ivey-Weaver Road, 1.3 km E of North Jefferson Street, Milledgeville. 27 April 1990. Vertebrate Zoology class. GCSU 2338.

Eumeces laticeps (Broadhead Skink). Baldwin Co: Ivey-Weaver Road, 1.3 km E of North Jefferson Street, Milledgeville. 10 April 1991. D. Peck. GCSU 3628.

Sceloporus undulatus undulatus (Southern Fence Lizard). Upson Co: 4.5 km NE of Rock. 11 April 1991. Collector unknown. GCSU 3637. Fayette Co: Peachtree City. 23 March 1990. Dennis Parmley. Verified by D. Walker. GCSU 3664.

Elaphe obsoleta spiloides (Gray Rat Snake). Seminole Co: 24.2 km S of Dresser, Lake Seminole. 15 July 1990. Dennis Parmley. Verified by D. Walker. GCSU 3916. Fills distribution gap in southwestern Georgia between Early, Miller, and Decatur counties.

Farancia abacura abacura (Eastern Mud Snake). Bibb Co: I-75, 2.6 km E jct. I-16 and I-75. 25 September 1994. G. B. Lacy. DOR. GCSU 4002. Extends range ca. 29 km west from Wilkinson County.

Farancia erytrogramma erytrogramma (Rainbow Snake). Seminole Co: 24 km S of Dresser, Lake Seminole. 12 July 1990. Dennis Parmley. Verified by D. Walker. GCSU 2378. Nearest Georgia record is ca. 80 km to the northeast.

Lampropeltis getula getula (Eastern Kingsnake). Baldwin Co: Ivey-Weaver Road, 1.3 km E of North Jefferson Street, Milledgeville. 3 October 1996. Gabe Gaddis. Juvenile. Photo GCSU CP0001. Completes county sequence in central Georgia.

Masticophis flagellum flagellum (Eastern Coachwhip). Baldwin Co: Blandy Hills Road, NW Milledgeville. 19 August 1992. Dennis Parmley. Verified by D. Walker. GCSU 3705.

Nerodia erythrogaster erythrogaster (Redbelly Water Snake). Baldwin Co: 6.4 km W Milledgeville. Collector unknown. 1 May 1989. GCSU 2175. Jasper Co: 6.4 km SE Monticello. 14 April 1991. Barry Hooper. GCSU 2175.

Nerodia taxispilota (Brown Water Snake). Baldwin Co: Lake Laurel, 3.4 km N Lake Laurel Road and Ga. Rt. 22. 3 June 1991. Collector unknown. GCSU 3569. Putnam Co: Rt. 441 at Lake Sinclair. 15 April 1990. Al Mead. GCSU 2394. Warren Co: 19.8 km S Warrenton. 17 October 1993. Collector unknown. GCSU 3781.

Opheodrys aestivus (Rough Green Snake). Fayette Co: Peachtree City. 3 September 1989. DOR. Dennis Parmley. Verified by D. Walker. GCSU 2302. Putnam Co: no other data. 8 October 1989. Collector unknown. GCSU 2296.

LITERATURE CITED

LAERM, J., E. BROWN, AND K. BARKER. 1996. New records of amphibians and reptiles from the Cumberland Plateau in Dade County, Georgia. Herpetol. Rev. 27:91–92.

WILLIAMSON, G. K., AND R. A. MOULIS. 1994. Distribution of Amphibians and Reptiles in Georgia. Savannah Sci. Mus. Spec. Pub. 3:1–712.

BOOK REVIEWS

Die Blindwühlen, by Werner Himstedt. 1996. Die Neue Brehm-Bücherei Bd. 630, Westarp Wissenschaften, Magdeburg and Spektrum Akademischer Verlag, Heidelberg, Germany. 160 pp., 62 illustrations. Softcover. DM 39.90 (approx. US $25.15). Available from Verlagssitz Magdeburg, Kirchstrasse 5, D-39326 Hohenwarsleben, Germany.

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Werner Himstedt has produced a long-needed, thoughtful, meticulous, and reasonably thorough and current overview of the information available about the indubitably most interesting (in my clearly unbiased opinion) but least well known amphibians, the caecilians. Himstedt wisely chose not to attempt to be all-inclusive, but presents considerable background information about caecilians while emphasizing his own work on the physiology, morphology, behavior and ecology of *Ichthyophis* in Thailand. The book, written in German, presents a scholarly and well chosen body of information, appropriate to all students of the biology of amphibians, and at the same time it is written in a manner that is accessible to the interested amateur keeper-and-observer of caecilians. The illustrations are excellent, many original and many re-drawn by Himstedt for clarity, and are large enough to be interpreted easily. A color plate illustrating six species in three families is of special interest.

The book includes eleven major sections, an extensive list of references, and an index. The introduction presents caecilians in a general context, then discusses early research on the systematics and biology of caecilians, including comments on the derivation of the name of the order. Special tribute is given to the pioneering work of the Sarasins, whose work published more than one hundred years ago remains the most comprehensive study of any species of caecilian. The second chapter on the ancestry of caecilians is a general view of the relationships of caecilians to other amphibians. Its emphasis on the impressions of Romer and Parsons and of Starck predominates (largely because of the two illustrations, and the absence of a cladogram based on more recent analysis), but Himstedt includes information on the Jurassic fossil caecilian with limbs, *Eocaecilia*, refers to recently published phylogenies based on molecular data, and comments on relationships of caecilians to other fossil and recent amphibians.

The third chapter, on the classification and geographic distribution of caecilians, is a general overview of the current taxonomy of caecilians. Himstedt notes that one should regard the classification that he presents as provisional, with considerable work remaining to be done on these little-known amphibians. Himstedt lists each family and its included taxa, with general comments on the key characters for each group. A general distribution map for each family, with brief discussion in the text, is included.

The fourth chapter, on the structure and function of organ systems, is a review of work on the skin and scales, the skeleton and musculature (including an extensive discussion of feeding mechanics), the intestine and lungs (including past and some recent physiological work on the latter, and reference to the recently described lungless species), the heart and circulatory system, the urogenital system (including reproductive cycles), and the brain and sense organs. The latter part on the nervous system is nearly 40 pages long, and includes considerable material and especially features Himstedt's thoughtful consideration of the structure and function of the eye and the tentacle, the former with comparison to the condition in salamanders, and the lateral line system. Himstedt is by training a neurophysiologist, and much of his analysis is based on his original work on caecilians. However, the discussion presented in this little book extends and integrates his work with that of others, and presents a synthetic approach to the neurobiology of these animals.

A short chapter on reproduction and development reviews much of the older and recent literature, and includes Himstedt's own observations, some, but not all, previously published. The chapter on the habits of caecilians is both a useful review of the literature on the ecology, life histories, and population biology of caecilians (and such literature is woefully limited, the Sarasins again having set the standard) and a presentation of Himstedt's own observations of the biology of *Ichthyophis kohtaoensis* based on his extensive field work in Thailand. Considerable new information about that species is presented; unfortunately, the two photographs of the field sites, while informative, did not reproduce well. The chapter on diet and prey capture is very short, slightly more than one page. Himstedt comments on the paucity of literature in this area, while summarizing much of the 100 years of data (mostly since 1970) that do exist on the termites, worms, and other terrestrial/fossorial animals that apparently compose the diet of caecilians. The chapter on burrowing behavior is inclusive of most of the information on burrowing mechanics, morphology, and comparisons among species, and adds new information from Himstedt's lab on the behavior of *I. kohtaoensis* in its tunnel systems. The short chapter on diel activity is similarly informative, and based largely on new information that Himstedt and his colleagues have gathered. Unfortunately, two recent papers on such activity in *Typhlonectes* were published too recently for Himstedt to have included them, but pose an interesting comparison the reader should consult.

The tenth chapter, on danger to and protection of caecilians, is an informed consideration of the apparently increasing rarity of caecilians as tropical habitats are progressively degraded. Himstedt presents information on the state of Thailand's forests, and cites the effect of a major monsoon and its consequences. He briefly compares Thailand with other southeast Asian countries, and closes with a plea for protection and the establishment of reserves so that such species as caecilians will be able to survive locally.

The final chapter deals with holding and breeding caecilians in captivity. He describes appropriate terrarium conditions for terrestrial species, including soil, humidity, water, and food, and presents comparable information for aquaria for aquatic caecilians. For each "set", he considers conditions for breeding caecilians, and he describes the work in his laboratory using endoscopy to examine the reproductive condition of males and females.

Himstedt is one of a small group of researchers who are exploring methods for breeding caecilians in order to provide both specimens for basic research and as means of conservation of the animals.

All in all, Himstedt's little book is a treasurehouse of new information and a synthesis of the literature, done in a scholarly way but one that should have broad appeal and readability. Some of the literature that might have provided useful information is not included, but Himstedt's selection is true to his goal. In addition, several recent publications on morphology, physiology, systematics, and behavior of caecilians appeared too late to be included, but they are part of the relative explosion of interest and information about the heretofore largely neglected caecilian amphibians. Himstedt's conscientious book provides the layperson and the professional with a ready update and background for the new work, and I trust he will continue his own outstanding research on caecilians. My only concern about this book, which deserves an extended audience and a long life, is that it is published only in German, presumably, and understandably, in large part for the increasingly large group of hobbyists who keep caecilians in captivity. The book is excellent for that purpose, as I have indicated, but it is much more than that—it is a compendium that belongs in the hands and before the eyes of anyone at any level of expertise who is interested in the biology of amphibians, tropical biology and conservation, morphology, physiology, and evolution. I urge everyone who reads German and shares these interests to buy the book, and those of you who would like to see English, Spanish, French and other translations to notify the publisher, so that new editions in these languages will be available very soon.

A Guide to the Reptiles and Frogs of the Perth Region by Brian Bush, Brad Maryan, Robert Browne-Cooper, and David Robinson. 1995. University of Western Australia Press, Nedlands, Western Australia (distributed in the USA by International Specialized Book Services, Inc., 5804 N.E. Hassalo St., Portland, Oregon 97213-3644, USA) xiv + 226 pp. Softcover. US $19.95. ISBN 1-875560-42-4.

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Australia continues to be the source of a seemingly limitless number of popular and semi-technical herpetofaunal guides of high production quality. Here is another. The book covers the herpetofauna of a region of Western Australia radiating out from the city of Perth to Yanchep in the north and Mandurah in the south, and from the western slopes of the Darling Range to Rottnest and Garden Islands. The region is the most often visited part of Western Australia, and although it lacks many of the more spectacular forms inhabiting the Pilbara and Kimberley regions of tropical Western Australia, it has an especially high level of endemism.

The book covers almost 100 species including 16 frogs (all but two of which are myobatrachids), two chelids (*Chelodina oblongata* and the extremely rare *Pseudemydura umbrina*) , 52 lizards (27 skinks, 11 geckos, eight pygopods, three agamids and three varanids), and 26 snakes (15 elapids, six hydrophiids, three typhlopids, and two pythons). Keys and brief familial and generic synopses are provided but the species accounts form the core of the book. These are concise and include subheadings for habitat, description, and general comments (ecology, reproduction, diet, etc.). For frogs the general comments are replaced by a "mating call and breeding biology" section. All terrestrial species have their own accounts and are accompanied by one or more color photos (up to four, as in the case of the western brown snake, *Pseudonaja nuchalis*) and an outline map of Western Australia with the species' range shaded. In the case of sea snakes, however, a separate account is provided for only one of the six species, *Pelamis platurus*, and although a key to four sea turtles is provided, only an extralimital (Broome) specimen of *Chelonia mydas* is figured, and no individual species accounts are presented. Dangerously venomous snakes are marked as such in the guide and receive the most detailed treatment of any of the included taxa, including brief comments on venom.

Other sections of the book include an overview of habitat types encountered in the Perth area (supplemented with seven representative color photographs), and a review of the conservation of amphibians and reptiles that criticizes the existing legislation in Australia for being too restrictive of serious amateur naturalists and for favoring the protection of individual species over the more essential protection of habitats. There are also sections on snake bite and snake-human and snake-pet interactions, with first aid measures conveniently summarized on the last two pages of the book for easy emergency use.

The guide concludes with a glossary of 300 terms, aimed largely at the novice, an index to subjects (incomplete) and common and scientific names, and a reference section. Those hoping for a comprehensive bibliography for the region will be disappointed. Only 41 technical references are cited, six specific to the Perth area, and the remainder more general. Frog references are especially scarce. General Australian herp works are referenced separately, and most major works are included, although the contributions of Harry Ehmann and Mike Tyler to the *Encyclopedia of Australian Animals* series are not (see Bauer, 1993 for references to these and other Australian herp books).

The book is attractively laid out and photo quality is consistantly high throughout. The value of the photos is increased by a feature rarely seen in comparable guides, the indication of the locality associated with each photographed specimen. The few line drawings are also well-executed, but the range maps are too small to show distribution patterns within the Perth region itself. The quality of the text and accuracy of information is generally good, but there are some problems. For example, the erroneous belief that the setae of gecko scansors function as pitons to gain purchase in minute irregulatities on smooth surfaces is promulgated. My greatest complaint, however, is that the generic names used do not consistantly follow Cogger (1992), nor do they always follow the most recent systematic treatments. Thus, among geckos *Strophurus* is employed for the "tail-squirting" *Diplodactylus*, but *Phyllodactylus* is used in preference to *Christinus*, as is *Underwoodisaurus* instead of *Nephrurus* (for *N. milii*).

Do you need this book? Unless you plan to visit the Perth region, can't get enough of Australian herp photos, or are bibliomaniacal, probably not. On the other hand, this very aesthetically pleasing guide is cheap and provides a user-friendly alternative to the more technical works on the Western Australian herpetofauna by the late Glenn Storr and his colleagues.

LITERATURE CITED

BAUER, A. M. 1993. Second World Congress of Herpetology literature review. Herpetol. Rev. 24:69–71.

COGGER, H. G. 1992. Reptiles and Amphibians of Australia, 5th ed. Cornell University Press. Ithaca, New York.

A Turtle Atlas to Facilitate Archaeological Identifications, by Kristin D. Sobolik and D. Gentry Steele. 1996. The Mammoth Site, Hot Springs, South Dakota. ISBN 0-9624750-7-6, 117 pp. US $19.95.

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This book was compiled on the premise that a set of brief anatomical descriptions, combined with line drawings of turtle shells, constitutes a useful aid to the identification of turtle material from archaeological sites. It consists of 31 pages of double spaced text, 7 tables, 69 figures, and 6 maps. Forty-six of the figures are exploded views of carapaces or plastra rendered as unweighted line drawings. Most of the remainder are black and white photos of a single skeletal element from 13 different North American turtle taxa.

The text is superficial, especially when describing skulls and non-shell postcrania. There is little attempt to use the existing terminology for turtle skeletal morphology. Instead, a number of novel anatomical terms are introduced such as double track and single track vertebrae, stair stepping peripherals, pads (for dermal callosities in trionychids), and scute lines (for sulci). The authors also seem to have trouble with the singular versus plural forms of the terms scapula, ulna, epiplastron, and numerous others. An emydocentric view of turtle skeletal morphology, extensive use of secondary references, and poor writing all reduce the value of the text.

The authors are also clearly behind in their turtle taxonomy. The genera *Pseudemys, Trachemys,* and *Apalone* are not used. *Xerobates* is thought to include a single species, not two; *Chrysemys* (*sic*) *concinna* is equated with *Pseudemys texana*, and *Apalone*, it is said, has subsumed *Trionyx spiniferus*. Even common names suffer; the name Loggerhead Snapping Turtle is given for *Chelydra*.

This book contains too many mistakes. A plate of pubes (Fig. 15) is labeled as ischia, and a plate of ischia (Fig.16) is labeled as pubes. Descriptions in the text make it clear that the authors have these elements confused. An anomalous suprapygal of a *Gopherus berlandieri* is identified as a neural; it is suggested that Meylan (1987) justified the use of the term *Apalone* using biochemical characters (that is yet to come); and the oldest chelydrid is said to be Pliocene (Erickson 1973, describes a Paleocene form). Furthermore, the authors miss some good characters for identifying fragmentary turtle shell material such as the fusion of the shell of *Terrapene*, the large, continuous, dorsal keels on any costal bone of *Macroclemys*, and the hypo-xiphiplastral hinge in *Kinosternon*.

This book is a clear indication of why the peer-review process is a good idea. In their "final remarks," the authors suggest making identifications using this atlas and "most importantly, by making direct comparisons with a reference collection." I would have to suggest skipping directly to the second step.

LITERATURE CITED

ERICKSON, B. R. 1973. A new chelydrid turtle *Protochelydra zangerli* from the Late Paleocene of North America. Sci. Publ. Sci. Mus. Minnesota 2:1–16.

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

Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia, by Raymond Hoser. 1996. Kotabi Publications (P.O. Box 599, Doncaster, Victoria 3108, Australia). xx+259 pp. Paberback. AUS $25.00 (approx. US $22.00). ISBN 0-9586769-09.

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Reptiles are relatively hardy in transportation. Only half a century ago, before the global rise of conservation and decline of postal services, it was normal to exchange live reptiles by international mail, not necessarily airmail. Now two modern processes are both countering and stimulating each other. On the one hand, most countries restrict collecting and exporting; on the other hand, herpetoculture is spreading. The blooming amateur market annually cycles millions of dollars in the United States alone. Some of its global volume in terms of herpetofauna has been reviewed for 1980–1985 by Luxmoore et al. (1988). This market, with its appetite for rarities, has stimulated, besides more positive results, the related phenomena of illegal collecting, trading, and smuggling, all of which are facilitated by the portability of reptiles (Hoser 1993).

Bureaucratic systems of licensing and inspecing have mushroomed almost everywhere. The mix of extensive legislation, haughty authority, insatiable desires, and ample money has generated its natural parasitic fauna of high-handedness, fanatic enforcement, corruption, and bribery—in some countries more than in others. It must have come as a shock to many readers of "Smuggled" (Hoser 1993; reviewed by Werner 1995), when Australia, celebrity of nature protection, was exposed by Raymond Hoser as a focus of negativity. It transpired that not only was smuggling of the endemic protected fauna rampant but many officials of governmental nature conservation agencies found a variety of ways to personally gain from it. Not merely bribery but perjury, violence, robbery, and even murder crowd the pages of "Smuggled" and make it a suspense story.

"Smuggled-2" is a sequel and like many a sequel is somewhat weaker than the initial book, perhaps mainly because the surprise element has dimmed. Still, it is compellingly interesting.

The twenty chapters may be seen as five clusters, each of which doubles as a separate appendix to "Smuggled." (I) Prefaces by others and chapters 1–3 depict the author's fight for legitimate (rather than illegal) conservation (especially in Australia), culminating in his "Smuggled," and the illegal war which aggrieved officials tried to wage against writing, publishing, and circulating the book. (II) Chapters 4–5 update the reader on the progress of inquiries into wildlife smuggling and related corruption, originally reported in "Smuggled." (III) Chapters 6–15 bring a deluge, in quantity and variety, of conservation-related crimes in Australia, often with the involvement of officials. Mixed in are some occurrences of possibly less criminal incompetent bungling of conservation authorities. Some of the contents is fresh, having occurred after the publication of "Smuggled." Other cases actually had occurred earlier, and it was the reading of "Smuggled" that stimulated witnesses to speak up. (IV) Chapters 16–17 widen the scope to encompass wildlife poaching in Africa and the astonishing Madagascar fiasco (March 1993), when police shot four visiting herpetologists, already prostrate by order, killing two and crippling the well-known F. J. Obst. (V) Chapters 18–19 consider

prospects for the future, including the potential of captive breeding for saving species. There is no index.

The bibliographies of published and unpublished source materials (Chapter 20; 29 pages), are intended to testify to every word in the book. Unfortunately the sources are not numberred and usually the text does not guide the reader to them. Still, everything appears to be true, because otherwise even in the most liberal of countries, no author could retain impunity, shooting such barrages of accusations at officialdom. In fact, Hoser's very ability to speak up (despite being harrassed for this) attests to the basic rectitude of the country, so many of whose emissaries are shown to be wrong doers.

The text is enriched with some 125 black-and-white photographs. These are not numbered and don't shine on the dull paper but they are fully explained and materially help in conveying the message. Most of the figures fall into one of four classes: "Good guys" (27 persons fighting corruption, innocent victims of corruption, etc.); "bad guys" (26 corrupt or allegedly corrupt nature inspectors and politicians, etc.); problematic animals and plants and equipment for smuggling them (39 figures); documents (24 newspaper clippings, letters to or from authorities, etc.).

Hoser fights on behalf of the animals and the lovers of animals, both against mercenary exploiters of fauna and flora and against fanatic or corrupt conservation-bureaucrats. I share his attitude that this is a war of light against dark. But I think that sometimes the light dazzles him. For example, he seems to imply that some confiscated animals should have been released into the wild, which is controversial in terms of population genetics and long-term effects. He assaults with a fervor that scorns the careful use of commas, apostrophes, and sometimes prepositions.

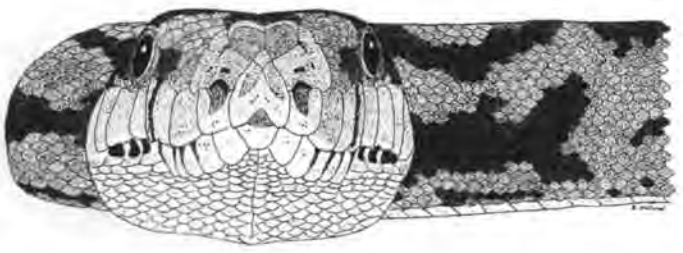
But all in all, assuming you are interested in conservation, if you have read "Smuggled" you will probably want this follow-up; if you have not read "Smuggled," then reading at least Smuggled-2 is a must.

LITERATURE CITED

HOSER, R. 1993. Smuggled: The Underground Trade in Australia's Wildlife. Kotabi Publications, Doncaster, Victoria. xii+149 pp.

LUXMOORE, R., B. GROOMBRIDGE, AND S. BROAD (EDS.). 1988. Significant trade in wildlife: A review of selected species in CITES Appendix II. International Union for Conservation of Nature.

WERNER, Y. L. 1995. A personal review of Smuggled, by Raymond Hoser. 1992. Brit. Herpetol. Soc. Bull. 54:42–43.



Morelia spilota (Carpet Python). Illustration by Dan Holland.

The Galápagos Tortoises: Nomenclatural and Surival Status, by Peter C. H. Prichard. Chelonian Research Monographs, Number 1, 85 pages, 12 black & white plates, 53 color plates. Hardcover edition (ISBN 0-965354-0-8) US $29.00, softcover edition (ISBN 0-965354-1-6) $19.00. Available through the Chelonian Research Foundation, 168 Goodrich Street, Lunenburg, Massachusetts 01462, USA.

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The Galápagos are perhaps the most biologically famous of all island groups. The leading citizens of Galápagos are the giant tortoises, once called *Geochelone elephantopus*, now generally referred to as *Geochelone nigra*. Efforts by systematists to chart the evolution of Galápagos tortoises have been made difficult by many unfortunate events. Inadequate records, some centuries old, and the decimation of populations by pirates, poachers, and introduced animals have made it difficult to prepare a monographic revision. Even pulling together all the literature, finding specimens previously mentioned, and interpreting an often arcane scientific past can be intimidating.

To everyone's benefit, Peter Pritchard has prepared a useful literature survey. It will be possible for a future systematist to do a thorough job of revising this highly variable lineage. Many interesting speculations are presented by Pritchard. Although none are subjected to test, circumstanial evidence supports some of his hypotheses. Pritchard's personal viewpoints are evident. His well known rejection of modern cladistic methods is especially anachronistic (see page 30), but then the science of systematics has never been his strong suit. Rather, Pritchard has carefully and quite admirably canvassed an old and often vague literature. Alas, clarity has not yet been achieved for a variety of reasons.

Pritchard is an engaging writer prone to romantic images presented with an ease of communication rare among scientists, but he does not consistently provide the details one expects in scientific contribution. Frequent qualitative assessments, rambling but readable prose, and practically no quantitative or statistical evaluation make it impossible to recognize this work as a modern monographic revision. For example, he suggests that the first tortoises to reach Galápagos were already giants. Unfortunately, no real test of such an assertion is provided. No phylogenetic hypothesis is provided to demonstrate the relative size of the sister taxa of *Geochelone nigra*. No statistics are provided to illustrate the current range of size in *G. nigra* populations, or to document that there exist statistically significant differences among populations. The suggestion that dwarfism might be more likely once the archipelago was colonized, although possible, must be recognized for what it is—an intriguing, but unsupported, speculation. Pritchard's book is a good literature survey, but it does not fill the need for a modern, comprehensive, thorough, monographic revision of the Galápagos tortoises.

Although Pritchard claims the title of "first revisor" (see bottom of page 48), this work does not warrant the accolade. No list of diagnostic features is provided for each taxon. No key to the identification of specimens is presented. There is no list of specimens examined by Pritchard or any indication of how specimens

in well known collections (e.g. CAS, BMNH, USNM, AMNH, MCZ) ought to be allocated to the names he recognizes.

Here are a few minor quibbles. Except for a very few photographs of type material and an illustration that appeared in another publication, most of the pictures do not identify the tortoises using Pritchard's Latin names. None of the maps provide a scale bar, latitude or longitude marks, or a compass direction. Not all the maps consistently provide topographic relief, nor is the interval for topographic lines, when present, indicated in all maps. In fact, if it had been possible (I suspect it was not), I would have prerferred range maps that indicated both collection points and expected distributions.

I found Pritchard's detailed critique of Garman (1917) to be an odd indulgence. Despite Garman's deserved and secured position in the history of herpetology, this 1917 paper is an unfortunate contribution to the literature on Galápagos tortoises. Pritchard's valuable time could have been better spent. Both Van Denburgh's (1914) and Rothschild's (1915) earlier studies are better and of the same vintage. Also, I could not agree with Pritchard's characterization of my work, which leaves me wondering if he misinterpreted the results of others.

One final quibble—to be politically correct—why did Pritchard elect to preferentially use Anglicized island names? The Ecuadorian government has devoted a great deal of time and scarce financial resources to the conservation of Galápagos. It would have been a courtly gesture to recognize the appropriate Spanish names for all the islands as primary. Certainly the parenthetical use of the English names would have been better for recognizing Ecuador's sovereignty over Galápagos.

I am sure that most readers of this review will recognize many of the above comments as little more than picky and obsessive. Anyone who knows people interested in turtles will recognize the sort of person likely to make them. However, I do hope that a few of the points I have made will be taken seriously enough to result in the sort of monograph that Galápagos tortoises deserve.

LITERATURE CITED

GARMAN, S. 1917. The Galapagos tortoises. Mem. Mus. Comp. Zool. 30(4):261–296.

ROTHSCHILD, W. 1915. The giant tortoises of the Galapagos Islands in the Tring Museum. Novitates Zool. 22:403–417.

VAN DENBURGH, J. 1914. The gigantic land tortoises of the Galapagos archipelago. Proc. California Acad. Sci. (4) 2 (1):203–374.

Recopilacion de Claves para la Determinacion de Anfibios y Reptiles de Mexico, by Oscar A. Flores Villela, Fernando Mendoza Quijano, and Gracia Gonzales Porter (compilers). 1995. Publ. esp. Mus. Zool. (10):iv + 1–285. Universidad Autónoma de México, Museo de Zoologíca, Departamento de Biología, Apartado Postal 70-399, México, D.F., 04510, México. ISSN 0188-6843. Cost not given.

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This 8 1/2 x 11-inch paperback is a compilation of 104 keys to the amphibians and reptiles of México that have appeared in numerous publications since 1945, as well as including 16 keys presented for the first time. Some keys cover only certain parts of some genera. Three of the older keys have been modified. All previously-published keys are used with permission of authors or publishers, and original authors are listed for each key. The older keys are electrostatic copies of the originals, thus the printing throughout varies according to the quality and style of the original.

Previously published keys for the most part have not been modified to reflect current taxonomy, though notes at the end update the classification and make the user aware of new taxa that have since been described. A breakdown of the keys have Anura with 19, Gymnophiona with 6, Sauria with 32, Serpentes with 33, Testudines with 13, and Crocodilia with 1.

In several instances the Spanish version of a key is presented when the original had both English and Spanish versions. New keys consist of those by J. R. Dixon (*Tomodactylus*; *Coleonyx*; *Phyllodactylus* for Baja California and mainland México); E. Pérez-Ramos and G. Casas A. (*Rana*); K. DeQueiroz (Mexican iguanas); C. Lieb (*Anolis*; *Eumeces*); A. Nieto-Montes de Oca (*Anolis schiedi* group, two keys); R. L. Bezy and J. L. Camarillo (Xantusiidae); J. D. Johnson (*Masticophis*); K. P. Kofron (*Sibon*); D. A. Rossman (*Thamnophis*); I. Goyenechea (*Conopsis* and *Toluca*). The keys to *Anniella* and *Ophisaurus* were adapted and translated into Spanish from the original by Walter Schmidt Ballardo and *Xenosaurus* by Edmundo Pérez Ramon and Lucía Saldaña de la Riva.

The publication begins with an index followed by an introduction in Spanish and a short section on literature cited. This is only for the literature cited in the introduction; many more publications are listed in the notes sections under various keys to update them. This is followed by nine plates of drawings showing characteristics of the various groups. Some additional plates are included with various keys.

As stated, 85 of these keys have been published previously, but the value of this publication is to have all of the keys at one's fingertips. Even the older keys work due to the accompanying notations (in Spanish). Anyone working on the Mexican herpetofauna will welcome this addition to the literature. The compilers have produced a very useful piece of work.

ERRATUM

In the two book reviews by Lamar and Liner (Herpetol. Rev. 27[2]:103), J. T. Collins erroneously was listed as the *editor* of the SSAR Common Names publication; instead, he should be listed as *author*.

Rana catesbeiana (Bullfrog). USA: New Hampshire: Wonalancet. Illustration by Mark C. Erelli.

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

ISSN 0018-084X

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

Herpetological Review

Volume 28, Number 3 September 1997