

Additional Records of the Reptiles of the Central Prairie Region of the United States

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Data for the present contribution has been gathered during numerous field expeditions in the Middle West particularly from 1931 to 1933. Original observations have been made on the habitats and habits of certain species, and many county records are added to the known range of numerous forms.

The area covered by this report includes sections of Indiana, Illinois, Iowa, Missouri, Arkansas, Oklahoma, Kansas, Nebraska, South Dakota and Wyoming; but the major portion deals with the herpetology of Kansas, Nebraska and Oklahoma, with especial reference to Kansas.

The specimens involved in our study have been widely distributed to museums and individuals, both at home and abroad, but most of them are deposited in places where they are readily available for further study. Friends, collectors, and correspondents (exclusive of students at Southwestern College), who have collected specimens presented herein, are listed as follows: F. M. Adams, J. A. Allen, Leo Brown, Waunita Burchell, David Dunkle, Max Elias, Edith R. Force, Howard K. Gloyd, Charles Hadley, Daniel Hink, Charles Keech, W. S. Long, Harold Lyon, Horace Lyon, George Jelinek, Paul McGrew, Roy L. Moodie, Richard Nelson, C. B. Perkins, Alvin Peterson, E. F. Powell, Theodore Robb, Ottys Sanders, Dorothy Schreck, Hobart M. Smith, Edward H. Taylor, E. C. Thayer, Samuel Tihen, Robert H. Wolcott, and G. A. Whitney. Data have been obtained from specimens at the University of Nebraska through the courtesy of Dr. Otis Wade and Mr. E. F. Powell; at Kansas State College through Dr. Robert K. Nabours and Mr. M. J. Harbaugh; and at Southern Methodist University through Dr. S. W. Geiser and Dr. Elmer P. Cheatum.

The following students of Southwestern College have collected reptiles that are discussed in this report: Byard Anderson, Phil Antrim, Keith Corp, Clayton Gerboth, Victor Edgell, Clay Hildinger, Cornelius Rogers, Don Strother, Esther Stuber, and Merlin Trumbull.

Before presenting the discussion of species, something may be said pertaining to the systematic arrangement of the larger reptilian groups. In all three editions of their "Check List of North American Amphibians and Reptiles," Stejneger and Barbour (1917, 1923, 1933) have stated that their "higher groups and genera are in systematic sequence." With reference to the subclasses and orders of reptiles, the following arrangement has been maintained in all three editions (following Osborn, 1903):

- I. Subclass Diapsida.
 - A. Order Loricata (crocodile and alligator).
 - B. Order Squamata (lizards and snakes).
- II. Subclass Synapsida.
 - A. Order Testudinata (turtles).

The examination of modern publications in the field of paleontology by such authorities as Williston (1925), Berry (1929), and Romer (1933a-b),

indicates that the systematic sequence adopted in the North American Check List is not in accord with the known facts in the case, and that additional subclass names can be applied with a fair degree of certainty to the known reptilian aggregations. The modern outline of classification, as applied to the groups cited by Stejneger and Barbour, would be as follows:

- I. Subclass Anapsida.
 - A. Order Testudinata (turtles).
- II. Subclass Parapsida.
 - A. Order Squamata (lizards and snakes).
- III. Subclass Diapsida.
 - A. Order Loricata (crocodile and alligator).

Osborn used the name Synapsida to include the primitive reptiles now placed in the reptilian subclasses Anapsida and Synapsida, and Stejneger and Barbour have used the name "Synapsida" in connection with the turtles, but they have placed the group above the other modern reptiles in their phylogenetic scheme. In contrast to modern American workers in general, such European herpetologists as Mocquard, Parker, Bolkey, Werner, Mertens and Mueller, have placed the Testudinata at the beginning of systematic lists of reptiles in a "primitive or early-derived" position. This latter action is in accord with paleontological findings. The turtles are placed in the Subclass Anapsida by Williston and Romer, along with the primitive Order Cotylosauria, with which they agree in having the skull completely roofed over (temporal opening absent) and in having the feet spread widely apart, just as they were in their sprawling stegocephalian ancestors.

Adams (1933) placed the turtles in the modern subclass Synapsida, which has a lower temporal opening in the skull beneath the postorbito-squamosal arch, stating (p. 191) that it is possible that the turtles have a "secondary roof which resembles the Cotylosaurs." Romer, on the other hand, placed the turtles in the Anapsida, since it is "probable that they have retained the primitive solid skull roof." The status of the turtles, with respect to subclass, involves some uncertainty, perhaps, but there seems to be no question as to the primitive nature of the group as compared with that of the modern Parapsida and Diapsida.

The subclass Diapsida of Osborn (and of Stejneger and Barbour) includes the modern subclasses Parapsida and Diapsida. The Parapsida have an upper temporal opening present in the skull, while the Diapsida have both upper and lower temporal openings.

Therefore, the lizards and the snakes are parapsids and the crocodiles and alligators are diapsids. These two subclasses may be polyphyletic, as suggested by the phylogenetic trees produced by Romer (1933b), and in this case a more substantial arrangement (based on new characters) may be forthcoming. The Diapsida are technically more specialized than the Parapsida, although many of the modern lizards and snakes are as specialized as the Loricata in average features.

LIST OF SPECIES

WITH NOTES AND COUNTY RECORDS

TURTLES

Sternotherus odoratus (Latereille)

A young representative of this form was taken in a seine from the wooded Sandy creek, a branch of the Verdigris river, in southern Woodson county, Kansas, at a point 5½ miles northeast of Coyville (June 27, 1931).

Kinosternon flavescens (Agassiz)

These turtles are regular denizens of many of the ponds and sluggish streams within their range. They often have algæ on their backs, and they frequently bask in the sun near the water's edge. Individuals sometimes leave the water to forage on the land, and such activity becomes especially generalized during rainy periods.

KANSAS.

BARBER: 7 mi. S. Sun City (Smith, September 4, 1933).

CLARK: Bluff Creek, 10 mi. E. Ashland (Smith, July 24, 1933); 2 mi. S. Englewood (Smith, July 24, 1933).

COMANCHE: Bluff creek, 15 mi. E. Ashland (Smith, July 24, 1933).

ELLSWORTH: County line west of Brookville (Smith, 1932).

KINGMAN: Kingman (Smith, September 9, 1933).

KIOWA: 7 mi. S. Belvidere (Smith, September 4, 1933).

MEADE: 7 mi. W. Englewood (Smith, July 23, 1933).

SUMNER: 1 mi. E. Conway Springs (Smith, September 8, 1933).

NEBRASKA.

NUCKOLLS: 1 mi. W. Superior (Burt, May 14, 1933).

OKLAHOMA.

BECKHAM: 4 mi. S. W. Sayre (Hoyle, June 10, 1933).

Chelydra serpentina (Linnæus)

On August 9, 1933, Miss Virginia Stuber found 14 eggs of this species in the mud at the edge of Black creek, near Winfield, Cowley county, Kansas. The mass of eggs was drying out, but there had been plenty of moisture present for their development. All of the shells were "pipped," but the young snappers were dead in six of the eggs. Those in the other eight hatched on the same day as they were found (August 9), remaining alive, and living to carry on the normal routine of aquarium denizens. With the approach of colder weather in November and December, these young captives buried themselves in the mud and sand at the bottom of their laboratory home, but occasionally one of them was seen in a more or less exposed position after the water was changed in the aquarium (January and February, 1934).

ILLINOIS.

PEORIA: 11 mi. S. W. Peoria (Burt, June 4, 1933).

KANSAS.

COMANCHE: Schwartz Canyon near Arrington (Smith, September 5, 1933).

COWLEY: Black creek, 1 mi. S. E. Winfield (Stuber, August 9, 1933).

CRAWFORD: 4 mi. S. Pittsburg (Burt, July 27, 1931).

OSAGE: 2 mi. S. Barclay (Burt, June 3, 1933).

SALINE: 4 mi. W. Gypsum (Hoyle, May 14, 1933).

SHAWNEE: 5 mi. E. Dover (Burt, May 13, 1933); 8 mi. E. Pauline (Smith, September 10, 1933).

SUMNER: Ninescah river, 3 mi. S. Belle Plaine (Hoyle, July 15, 1932).

WABAUNSEE: 3 mi. E. Paxico (Burt, May 13, 1933).

MISSOURI.

BUCHANAN: East Atchison, near Missouri river (Burt, June 3, 1933).

JASPER: 2 mi. S. Asbury (Burt, June 27, 1931).

LIVINGSTON: 6 mi. W. Utica (Burt, June 4, 1933).

NEBRASKA.

KNOX: 5 mi. S. W. Crofton (Burt, August 9, 1931).

Emys blandingii (Holbrook)

The capture of a representative of this species (U. S. N. M. No. 86794) on the road above a shallow pond 2 mi. S. of Pilger, Stanton county (Burt, August 3, 1932), apparently constitutes the first record of the occurrence of *Emys blandingii* in Nebraska. At the time of collection the specimen was recognized as unique to the Middle West, so it was forwarded to Dr. Leonhard Stejneger, who kindly sent the above identification.

Terrapene triunguis (Agassiz)

Like the common ornate terrapin or box turtle, this species frequents the highways along its range, especially during the morning hours—when many of them are killed by automobiles.

ARKANSAS.

PERRY: 6 mi. W. Casa (Burt, June 29, 1931).

KANSAS.

CHEROKEE: Spring river, about 2 mi. N. Baxter Springs (Taylor, April 4, 1931).

MISSOURI.

CRAWFORD: 1 mi. N. E. Hoffins (Burt, August 31, 1933).

FRANKLIN: 2 mi. W. Leslie (Burt, August 29, 1933).

GASCONADE: 1 mi. W. Drake (Burt, August 29, 1933).

LACLEDE: 2 mi. S. Lebanon (Burt, August 31, 1933).

Terrapene ornata (Agassiz)

Ornate box turtles are most often found in grassy areas of the Middle West, but they may occur in the light woods as well. Thousands of individuals are, no doubt, crushed on the highways each year, as they are caught sunning themselves or foraging on road clearings adjacent to their natural habitats. Box turtles in search of food may be seen to snap at insects, especially grasshoppers, when occasion offers.

KANSAS.

BARBER: 4 mi. E. Lake City (Smith, September 2, 1933); 7 mi. S. Sun City (Smith, September 4, 1933).

CHASE: 3 mi. S. Cottonwood Falls (Burt, May 12, 1933); 5 mi. N. Strong City (Hoyle, May 12, 1933).

CHAUTAUQUA: 2 mi. S. E. Cedarvale (Hoyle, July 30, 1933).

CHEROKEE: 8 mi. E. Weir (Burt, June 27, 1931).

COFFEY: 1 mi. N. Lebo (Burt, June 3, 1933).

COMANCHE: Arrington (Smith, September 5, 1933).

COWLEY: 1 mi. N. E. Cambridge (Burt, April 22, 1933); 6 mi. N. E. New Salem (Hoyle, July 18, 1933); 2 mi. S. E. New Salem (Hoyle, July 18, 1933).

- CRAWFORD: 4 mi. S. Pittsburg (Burt, June 27, 1931).
 DICKINSON: 2 mi. N. W. Abilene (Smith, 1932).
 ELK: 4 mi. N. Moline (Burt, June 3, 1933).
 ELLSWORTH: County line E. Brookville (Smith, 1932); 4 mi. N. E. Carneiro (Hoyle, May 14, 1933).
 FORD: 3 mi. E. Dodge City (Trumbull, May 7, 1933).
 GEARY: 1 mi. S. W. Junction City (Hoyle, May 15, 1933).
 GREENWOOD: 1 mi. N. Severy (Burt, June 3, 1933); 2 mi. N. Tonovay (Burt, June 3, 1933).
 HARPER: Cimarron river, just S. Englewood (Smith, July 23, 1933).
 KINGMAN: 10 mi. W. Conway Springs (Smith, September 8, 1933); Kingman (Smith, September 9, 1933).
 LYON: 2 mi. N. E. Miller (Hoyle, May 13, 1933).
 MARION: 6 mi. S. Florence (Burt, May 15, 1933).
 MEADE: Cimarron river, 35 mi. S. E. Meade Co. State Park (Smith, July 22, 1933).
 OSAGE: 7 mi. N. Burlingame (Hoyle, May 13, 1933).
 SCOTT: State Park (Smith, July 21, 1933).
 SHAWNEE: 7 mi. N. E. Dover (Burt, May 13, 1933).
 SUMNER: Argonia (Burt, October 14, 1933); 2 mi. S. W. Dalton (Hoyle, July 18, 1933); 6 mi. W. Oxford (Burt, June, 1931).
 WABAUNSEE: 4 mi. E. Maplehill (Hoyle, May 13, 1933).

MISSOURI.

- CALDWELL: 4 mi. E. Hamilton (Burt, June 4, 1933).
 JASPER: 1 mi. E. Asbury (Burt, June 27, 1931); 1 mi. S. Asbury (Burt, June 27, 1931).
 MACON: 1 mi. W. Lingo (Burt, June 4, 1933).

NEBRASKA.

- SHERIDAN: 2 mi. E. Hoffland (Burt, August 17, 1931).

OKLAHOMA.

- BECKHAM: 4 mi. S. W. Sayre (Hoyle, June 10, 1933).
 CARTER: 3 mi. S. Ardmore (Burt, May 30, 1931).
 GREER: 3 mi. N. Blair (Hoyle, June 10, 1933); 9 mi. N. W. Blair (Hoyle, June 10, 1933).
 KAY: 6 mi. N. E. Newkirk (Burt, April 29, 1933).

Graptemys pseudogeographica pseudogeographica (Gray)

One of these keel-backed terrapins from Manila, Mississippi county, Arkansas, has been kindly presented to us by Mr. Ottys Sanders of the Southwestern Biological Supply House (1931).

Chrysemys bellii bellii (Gray)

Records for the painted terrapin of the Middle West are presented below.

KANSAS.

- COWLEY: 1 mi. E. New Salem (Hoyle, July 18, 1933).
 ELLSWORTH: County line, W. Brookville (Smith, 1932).
 SALINE: 4 mi. W. Gypsum (Burt, May 14, 1933).
 SCOTT: State Park (Smith, September 21, 1933).
 WOODSON: 9 mi. E. Toronto (Burt, July 27, 1931).

MISSOURI.

- BUCHANAN: East Atchison, near Missouri river (Burt, June 3, 1933).

NEBRASKA.

- LANCASTER: 5 mi. S. Lincoln (Corp, September 27, 1933).

Pseudemys elegans (Wied)

This turtle inhabits the larger streams and ponds of the Middle West.

ARKANSAS.

MISSISSIPPI: Manila (Sanders, 1931).

KANSAS.

COMANCHE: Mouth of Schwartz Canyon on Indian river (Smith, September 5, 1933).

ELK: 2 mi. N. Grenola (Hoyle, August 3, 1933).

OKLAHOMA.

CARTER: 3 mi. N. Ardmore (Burt, April 18, 1932).

LOVE: U. S. Highway No. 77 at 1 mi. N. Red river bridge (Burt, April 18, 1932).

Pseudemys texana (Baur)

Two of these turtles from Manila, Mississippi county, Arkansas, have been given to us by Mr. Ottys Sanders (1931), and a young specimen was taken in a seine at Sandy creek, a branch of the Verdigris river, at a point 5½ miles northeast of Coyville, in southern Woodson county, Kansas (Burt, June 27, 1931).

Amyda spinifera (Le Sueur)

Our records for this soft-shelled turtle are listed below.

KANSAS.

BARBER: 7 mi. S. Sun City (Smith, September 2, 1933).

BUTLER: 3 mi. S. E. Augusta (Hoyle, May 15, 1933).

COMANCHE: 4 mi. S. E. Arrington (Smith, September 5, 1933).

COWLEY: Walnut river, 1 mi. W. Winfield (Trumbull, April 30, 1933).

LOGAN: 3 mi. S. W. Elkader (Moodie, July, 1911).

LIZARDS

Crotaphytus collaris (Say)

After a large collared lizard was chased down a steep hill in Elk county, Kansas, on April 22, 1933, it dived into a pool of muddy water, where it hid in complete submergence beneath a small flat rock in an attempt to escape detection and capture.

In the early spring several individuals are often found under one rock, and sometimes these are a pair of adults, as in the case of two examples found in a hollow depression under a stone in Oklahoma county, Oklahoma, on March 15, 1932.

Under a flat rock, which was less than an inch in thickness and about two feet square, a female of this species was found in shallow burrow on May 28, 1932. A nest of 16 ovoid eggs was located at the end of this depression. These eggs, which were loosely packed in moist earth, were partially exposed to the lower surface of the rock, which in turn was subjected to the direct rays of the sun. Examination of three of the eggs showed two of them to contain small embryos.

Specimens have been taken as follows:

KANSAS.

BARBER: 2 mi. N. Lake City (Rogers, October 16, 1933).

BUTLER: 1 mi. N. Beaumont (Smith, September 9, 1933).

CHASE: 6 mi. S. Cottonwood Falls (Burt, May 12, 1933); 2 mi. W. Cottonwood Falls (Smith, September 1, 1933).

- CHAUTAUQUA: 1 mi. E. Cedarvale (Burt, April 3, 1933); 3 mi. W. Peru (Hoyle, April 3, 1933).
 CLOUD: Miltonvale (Smith, April 8, 1933).
 COWLEY: 1 mi. N. E. Cambridge (Burt, April 22, 1933); 2 mi. N. W. Cameron (Burt, May 6, 1933); 1 mi. N. Maple City (Hoyle, May 6, 1933); 1 mi. N. Rock (Hoyle, May 12, 1933).
 ELK: 3 mi. E. Moline (Burt, April 22, 1933).
 ELLSWORTH: 4 mi. E. Carneiro (Burt, May 14, 1933).
 GEARY: 1 mi. S. W. Junction City (Hoyle, May 15, 1933).
 HARPER: 5 mi. S. Harper (Tihen, July, 1933).
 LINCOLN: 10 mi. S. W. Lincoln (Burt, May 14, 1933).
 MITCHELL: 10 mi. S. Beloit (Hoyle, May 14, 1933).
 MONTGOMERY: 5 mi. N. E. Elk City (Burt, April 22, 1933).
 WABAUNSEE: 7 mi. N. Alma (Hoyle, May 13, 1933); 3 mi. S. E. Wabaunsee (Burt, May 13, 1933).

OKLAHOMA.

- KAY: 6 mi. S. E. Chilocco (Burt, April 29, 1933); 6 mi. N. E. Newkirk (Hoyle, April 29, 1933).
 LOGAN: 2 mi. N. Mulhall (Burt, April 15, 1932).
 OKLAHOMA: 7 mi. N. Oklahoma City (Burt, April 15, 1932).
 OSAGE: 2 mi. S. E. Avant (Burt, April 23, 1933); 10 mi. S. W. Bartlesville (Hoyle, April 3, 1933); 4 mi. W. Pawhuska (Burt, April 3, 1933).
 ROGERS: 6 mi. W. Claremore (Hoyle, April 23, 1933).

Holbrookia maculata maculata (Girard)

These spotted lizards are characteristic inhabitants of sandy areas, where they may seek shelter in holes among the roots of rose bushes or other shrubs, or in grass clumps. Young examples taken in Nebraska on August 18 and 19, 1931, were no doubt of the brood of that year.

KANSAS.

- BARBER: 7 mi. S. Sun City (Smith, September 2, 1933).
 BUTLER: 1 mi. W. Keighly (Smith, September 9, 1933).
 COMANCHE: Schwartz Canyon, near Arrington (Smith, September 6, 1933).
 HARPER: Cimarron river, S. Englewood (Smith, July 22, 1933).
 KINGMAN: 5 mi. W. Norwich (Smith, September 8, 1933); 4 mi. W. Spivey (Antrim, October 29, 1933).
 SUMNER: Argonia (Tihen, August 23, 1933).

NEBRASKA.

- CHERRY: 6 mi. N. E. Cherry (Burt, August 18, 1931); 7 mi. S. E. Gard (Burt, August 18, 1931); 9 mi. N. W. Wood Lake (Burt, August 18, 1931); 3 mi. S. E. Valentine (McGrew, July, 1933).
 GRANT: 2 mi. E. Whitman (Burt, August 18, 1931).
 SHERIDAN: 2 mi. E. Bingham (Burt, August 19, 1931); 2 mi. W. Bingham (Burt, August 19, 1931).

Sceloporus graciosus graciosus (Baird and Girard)

As noted by Van Denburgh in 1922, the range given by Stejneger and Barbour for this subspecies largely overlaps the one listed for *S. undulatus consobrinus*, and it is evident that in the west *graciosus* has at times been considered as *consobrinus* and that in the east the opposite is true. This is not surprising, since the coloration, scutellation and size of the two forms compares favorably in most respects. However, the keels are less pronounced on the dorsal and lateral scales of *graciosus* (especially on the back of the thighs) as discerned by Van Denburgh. Since all morphological distinctions are slight, the ranges adjacent, and the resemblances marked, a close relationship is

indicated for the two forms and it is very probable that *graciosus* and its subspecies arose in rather recent geological times from common ancestral stock with members of the *undulatus* complex (such as *consobrinus* and *elongatus*).

The morphological differentiation between *consobrinus* and *graciosus* may be summarized as follows:

Scales from the occiput to the base of the tail, 36-43; scales on back of thigh usually keeled; adult males often with a distinct blue spot at each side of the chin (Dakotas, south to Texas; also, eastern Colorado and Wyoming).

S. undulatus consobrinus Baird and Girard
Scales from the occiput to the base of the tail, 40-55; most of scales on back of thigh smooth; adult males usually with a grayish or bluish mottling on the throat, but sometimes with noticeable blue concentrations at each side of chin (eastern Oregon to central Montana, south through east-central Wyoming and western Colorado to northern Arizona, and northwest through Nevada to eastern Oregon).

S. graciosus graciosus Baird and Girard

A specimen of *consobrinus* in the present collection from Goshen county, Wyoming, has 41 scales from the occiput to the base of the tail, which is a high figure for this form, but it would be a low one in the variational range of *graciosus*. Scale data in the above key are after Van Denburgh, our Wyoming specimens fitting within the extremes given by him.

S. graciosus graciosus exhibits sexual dimorphism in the coloration, in that all markings tend to be more distinct in the adult male than in the adult female. The adult male shows beautiful bright-blue belly patches, which are separated along the median ventral line, but in the young males and in the females these are indistinct or absent.

This spiny swift is a characteristic inhabitant of the rock ledges which are present in the arid foothill country of central and western Wyoming. In this environment sage brush constitutes the dominant form of plant life, although short clumps of grass are often present. On sunny days these creatures are very active in favorable habitats, where they forage on and about the rocks among which they live, darting into crevices when danger threatens. In a few instances individuals were found in brush below rock ledges.

WYOMING.

FREMONT: 14 mi. S. E. Dubois (Burt, August 13, 1931); 8 mi. E. Riverton (Burt, August 13, 1931); 7 mi. E. Shoshoni (Burt, August 13, 1931); 14 mi. E. Shoshoni (Burt, August 13, 1931).

NATRONA: 11 mi. N. W. Teapot Dome, at N. edge Midwest Oil Field (Burt, August 16, 1931).

WASHAKIE: 7 mi. W. Ten Sleep (Burt, August 16, 1931).

Sceloporus undulatus consobrinus Baird and Girard

These prairie swifts occur in sandy or rocky areas, usually near thickets of shrubbery. On April 30, 1933, individuals observed in Cowley county, Kansas, darted for shelter in holes at the base of the yucca plants. Some of these holes were very deep, offering the lizards ample protection from large enemies, but others were too shallow to afford security.

KANSAS.

BARBER: 4 mi. E. Lake City (Smith, September 2, 1933); 2 mi. N. Lake City (Rogers, October 16, 1933); 7 mi. S. Sun City (Smith, September 2, 1933).

COMANCHE: Bluff creek, 15 mi. E. Ashland (Smith, July 24, 1933).

COWLEY: 11 mi. S. W. Winfield (Hoyle, April 30, 1933).

HARPER: 1 mi. N. Harper (Tihen, August 5, 1933); 4 mi. N. and 8 mi. E. Harper (Tihen, August 23, 1933).

KINGMAN: 5 mi. W. Norwich (Smith, September 8, 1933); 4 mi. W. Spivey (Antrim, October 29, 1933).

McPHERSON: Battle Hill (Burt, May 12, 1926).

SCOTT: State Park (Smith, July 21, 1933).

SUMNER: Argonia (Tihen, August 23, 1933).

NEBRASKA.

CHERRY: 3 mi. S. E. Valentine (McGrew, July, 1933).

OKLAHOMA.

OSAGE: 7 mi. W. Bartlesville (Burt, April 3, 1933); 3 mi. W. Pawhuska (Hoyle, April 3, 1933).

WYOMING.

GOSHEN: 2 mi. S. E. Lingle (Burt, August 17, 1931).

Sceloporus undulatus undulatus (Latreille)

Several records are at hand for Arkansas lizards of this subspecies. One individual climbed a tree to a point over eight feet above the ground 4 mi. N. of Pine Bluff, Jefferson county (June 29, 1931); an example from Louisville, Lafayette county, is preserved in the Museum of Kansas State College; and specimens were taken at the base of a pine tree near a pond at Hensley, and in the shrubbery near a broad, rocky stream 11 mi. S. E. of Maumelle, in Pulaski county (June 29, 1931).

Phrynosoma cornutum (Harlan)

A newly-captured female horned lizard from Cowley county, Kansas, laid seven yellowish eggs while it was kept in a sunny location at a window on June 5 and 6, 1933. Various individuals taken along a freshly tarred roadbed in Garfield county, Oklahoma, on June 9, had much tar on their feet and ventral surfaces. One besmeared specimen was found in a cotton patch about a quarter of a mile from the road.

KANSAS.

BARBER: 7 mi. S. Sun City (Smith, September 3, 1933).

CHASE: 2 mi. W. Cottonwood Falls (Smith, September 1, 1933).

COWLEY: 4 mi. E. Arkansas City (Burt, May 6, 1933); 1 mi. N. E. Cambridge (Hoyle, April 22, 1933); 6 mi. N. E. New Salem (Hoyle, July 18, 1933); 5 mi. S. Winfield (Hoyle, July 21, 1933).

ELK: 2 mi. N. W. Grenola (Harold Lyon, August 25, 1933).

GEARY: 1 mi. S. W. Junction City (Burt, May 15, 1933).

HARPER: 5 mi. S. Harper (Tihen, July, 1933).

LINCOLN: 10 mi. S. W. Lincoln (Burt, May 14, 1933).

SEDGWICK: Clearwater (Burchell, April, 1933).

OKLAHOMA.

BECKHAM: Elk City (Hoyle, June 9, 1933); Sayre (Hoyle, June 10, 1933); 4 mi. S. W. Sayre (Hoyle, June 10, 1933).

GARFIELD: 5 mi. S. Enid (Hoyle, June 9, 1933).

KINGFISHER: 1 mi. N. Bison (Hoyle, June 9, 1933).

PAWNEE: Pawnee (Thayer, 1895, K. S. C. Mus.).

Phrynosoma douglassii hernandesi (Girard)

One of these short-horned horned lizards was collected 3 mi. S. E. Valentine, Cherry county, Nebraska, in July, 1933, by Paul McGrew.

Ophisaurus ventralis (Linnæus)

In Cowley county, Kansas, the joint lizard occurs in the same general habitat as the common skink *Eumeces obsoletus*, selecting conditions with an average of more moisture than that required by the second common lizard of the prairie ledges, *Crotaphytus collaris*.

KANSAS.

- COWLEY: Southwestern College Campus (Edgell, September 25, 1933); 9 mi. N. E. Winfield (Burt, May 7, 1933).
 ELLSWORTH: Ellsworth (Jelinek, September 11, 1933).

Cnemidophorus sexlineatus sexlineatus (Linnæus)

A six-lined race-runner was chased into a stream in Beckham county, Oklahoma, on June 10, 1933, where it escaped by swimming from one bank to the other (a distance of about 12 feet.)

ARKANSAS.

- JEFFERSON: 4 mi. N. Pine Bluff (Burt, June 29, 1931).
 MADISON: 2 mi. N. Crosses (Burt, June 28, 1931).
 PULASKI: 4 mi. S. E. Maumelle (Burt, June 29, 1931).

KANSAS.

- BARBER: 4 mi. S. E. Lake City (Smith, September 2, 1933).
 ELLSWORTH: 5 mi. N. E. Carneiro (Burt, May 14, 1933); 3 mi. E. Ellsworth (Hoyle, May 14, 1933).
 GEARY: 1 mi. S. W. Junction City (Hoyle, May 15, 1933).
 HARPER: 4 mi. N. and 8 mi. E. Harper (Tihen, August 23, 1933).
 KINGMAN: 6 mi. S. W. Norwich (Tihen, August 20, 1933).
 LINCOLN: 10 mi. S. W. Lincoln (Burt, May 14, 1933).
 SUMNER: Argonia (Tihen, August 23, 1933).

NEBRASKA.

- CHERRY: 3 mi. S. E. Valentine (McGrew, July, 1933).

OKLAHOMA.

- BECKHAM: 2 mi. S. E. Erick (Hoyle, June 10, 1933); 4 mi. S. W. Sayre (Hoyle, June 10, 1933).
 KAY: 6 mi. N. E. Newkirk (Burt, April 29, 1933).
 OSAGE: 4 mi. W. Pawhuska (Hoyle, April 3, 1933).

Leiolopisma laterale (Say)

The specimens listed below were taken in or near woods, often under stones, bark, pieces of tin, or other sheltering debris.

ARKANSAS.

- PULASKI: Granite Mt. near Little Rock (Adams, August 26, 1927, S. M. U. Mus.).

KANSAS.

- CHEROKEE: 3 mi. N. Baxter Springs (Smith, April 4, 1931).
 CLAY: Clay Center (Smith, April 9, 1933).
 POTTAWATOMIE: Flush (Smith, April 16, 1933); Wheaton (Taylor, April 9, 1933).
 WILSON: 4 mi. W. Neodesha (Burt, April 22, 1933).

OKLAHOMA.

- CRAIG: 4 mi. S. W. Whiteoak (Burt, April 23, 1933).
 CREEK: Bald Hill near Sapulpa (Force, April 2, 1932).
 ROGERS: 6 mi. W. Claremore (Burt, April 23, 1933).

Eumeces anthracinus (Baird)

One of these skinks, with no postmental scale and with no postnasal scale, was secured by F. M. Adams on Granite Mountain, near Little Rock, Pulaski county, Arkansas, on August 26, 1927 (S. M. U. Mus.). The specimen shows no trace of a middorsal stripe.

Eumeces fasciatus (Linnæus)

These skinks are often found under rocks, wood, bark or pieces of tin in the woods of eastern Kansas and eastern Oklahoma.

KANSAS.

CHEROKEE: 3 mi. N. Baxter Springs (Taylor, April 4, 1931).

ELK: 3 mi. N. W. Oak Valley (Burt, April 22, 1933).

LABETTE: Labette Ozarks near Mortimer (Hoyle, April 22, 1933).

OKLAHOMA.

CRAIG: 4 mi. S. W. Whiteoak (Burt, April 23, 1933).

CREEK: Bald Hill near Sapulpa (Force, April 2, 1932).

ROGERS: 6 mi. W. Claremore (Burt, April 23, 1933).

Eumeces multivirgatus (Hallowell)

A young, many-lined skink was secured in the sandhill region 2 mi. W. Bingham, Sheridan county, Nebraska, on August 18, 1931, where it was associated with the newly-hatched young of *Holbrookia maculata maculata*. The young of both of these species were protected here by clusters of grass and weeds, but there were no rocks.

Eumeces obsoletus (Baird and Girard)

An adult Sonoran skink with an adult northern skink (*Eumeces septentrionalis*) in its stomach was secured in Morris county, Kansas, on May 14, 1933.

KANSAS.

BUTLER: 1 mi. N. E. Chelsea (Hoyle, May 12, 1933).

CHASE: 3 mi. S. Cottonwood Falls (Burt, May 12, 1933); 5 mi. N. Strong City (Hoyle, May 2, 1933).

CLAY: Clay Center (Taylor, April 9, 1933).

COWLEY: 1 mi. N. E. Cambridge (Hoyle, April 22, 1933); 1 mi. N. Rock (Burt, May 12, 1933).

ELK: 3 mi. E. Moline (Burt, May 22, 1933).

ELLSWORTH: 4 mi. E. Carneiro (Hoyle, May 14, 1933).

GEARY: 1 mi. S. W. Junction City (Burt, May 15, 1933).

JEWELL: 3 mi. S. E. Mankato (Hoyle, May 14, 1933).

LINCOLN: 10 mi. S. W. Lincoln (Burt, May 14, 1933).

MARION: 2 mi. W. Marion (Hoyle, May 15, 1933).

MITCHELL: 10 mi. S. Beloit (Burt, May 14, 1933).

MORRIS: 9 mi. S. W. Council Grove (Hoyle, May 15, 1933); 6 mi. E. Council Grove (Burt, May 14, 1933).

OSAGE: 7 mi. N. Burlingame (Burt, May 13, 1933).

POTTAWATOMIE: 2 mi. N. E. Rocky Ford (Hoyle, May 15, 1933).

SHAWNEE: 8 mi. W. Topeka (Burt, May 13, 1933).

WABAUNSEE: 7 mi. N. Alma (Hoyle, May 13, 1933); 5 mi. W. Maplehill (Burt, May 13, 1933); 3 mi. S. E. Wabaunsee (Hoyle, May 13, 1933).

OKLAHOMA.

KAY: 6 mi. N. E. Newkirk (Burt, April 29, 1933).

OSAGE: 2 mi. S. E. Avant (Hoyle, April 23, 1933); 4 mi. W. Pawhuska (Burt, April 3, 1933).

Eumeces septentrionalis (Baird)

A northern skink was found in the stomach of a Sonoran skink (*Eumeces obsoletus*) in Morris county, Kansas, on May 14, 1933.

The large adult male of this species has rose-colored patches over the cheeks and at the side of the gular region, reminding one of the coloration found in large adult males of *Eumeces tetragrammus* and *E. brevilineatus* in Texas. *E. septentrionalis* is found in the open prairie ledges of Kansas, where there are no trees, but where rocks and prairie grass offer much protection. Colonies of the northern skink are rather hard to find, but the form is often abundant where it occurs.

KANSAS.

CHASE: 3 mi. S. Cottonwood Falls (Hoyle, May 12, 1933); 6 mi. S. Cottonwood Falls (Burt, May 12, 1933).

MORRIS: 6 mi. E. Council Grove (Burt, May 14, 1933).

SHAWNEE: Berryton (Dunkle, April 14, 1933).

WABAUNSEE: 5 mi. W. Maplehill (Hoyle, May 13, 1933).

SNAKES

Carphophis amœna vermis (Kennicott)

A worm snake was collected under stones on a grassy hillside near a spring not far from Spring river and about 3 miles north of Baxter Springs, Cherokee county, Kansas, by Edward H. Taylor and Hobart M. Smith on April 4, 1931.

Diadophis punctatus arnyi Kennicott

Fifteen of these prairie, ring-necked snakes were found under one rock in Cowley county, Kansas, on April 8, 1933, and an unusual example was secured in Chase county, Kansas, on May 12, 1933. The latter specimen, which was taken under a rock on the bank of a small, sparsely wooded stream, exhibited the following characteristics: ventral plates, 177; caudals, 38; upper labials, 7 on each side; body length, 298 mm.; tail, 48 mm.; ventral spots in a single median row. Thus, the scutellation of *arnyi* is combined with a main colorational feature of the eastern *punctatus*; also, the lower surface of an additional example of *arnyi*, from Marion county, is almost spotless, thus offering a colorational approach to the northeastern *edwardsii*.

KANSAS.

CHASE: 3 mi. S. W. Matfield Green (Hoyle, May 12, 1933); 5 mi. N. Strong City (Burt, May 13, 1933).

CHAUTAUQUA: 1 mi. E. Cedarvale (Hoyle, April 3, 1933).

CHEROKEE: 3 mi. N. Baxter Springs (Taylor and Smith, April 4, 1931).

CLOUD: Miltonvale (Smith, April 8, 1933).

COWLEY: 10 mi. E. Winfield (Hildinger, April 8, 1933).

DICKINSON: 4 mi. N. W. Herington (Burt, May 14, 1933).

ELK: 3 mi. N. W. Oak Valley (Hoyle, April 22, 1933).

GEARY: 1 mi. S. W. Junction City (Burt, May 15, 1933).

LABETTE: Labette Ozarks near Mortimer (Burt, May 22, 1933).

MARION: 2 mi. W. Marion (Burt, May 15, 1933).

MARSHALL: 2 mi. S. Blue Rapids (Nelson, October 25, 1933).

MORRIS: 9 mi. S. W. Council Grove (Hoyle, May 12, 1933).

SHAWNEE: 8 mi. W. Topeka (Burt, May 13, 1933).

WILSON: 4 mi. W. Neodesha (Hoyle, April 22, 1933).

OKLAHOMA.

- OSAGE: 2 mi. S. E. Avant (Burt, April 23, 1933); 4 mi. W. Pawhuska (Hoyle, April 3, 1933).
 ROGERS: 6 mi. W. Claremore (Burt, April 23, 1933).

Heterodon contortrix (Linnæus)

This hog-nosed snake was found in an orchard in a sandy area in Cowley county on April 30, 1933, just as it was in the act of stalking a prairie swift (*Sceloporus undulatus consobrinus*). Damp sand was still on the snake's back and the snake's track was traced backward to the entrance of a hole about six feet away, where digging disclosed the den, which was about three feet long and about eight inches deep. The hole averaged about three inches in diameter.

KANSAS.

- BARBER: 7 mi. E. Lake City (Rogers, October 16, 1933).
 CLARK: Englewood (Hink, September 15, 1933).
 COMANCHE: Arrington (Smith, September 8, 1933).
 COWLEY: 11 mi. S. W. Winfield (Hoyle, April 30, 1933).
 HARPER: Near Cimarron river directly south of Englewood (Smith, July 23, 1933); 4 mi. N. and 8 mi. E. of Harper (Tihen, August 23, 1933).

Heterodon nasicus Baird and Girard

This species occurs about sandy tracts in the prairie.

KANSAS.

- DICKINSON: 2 mi. N. W. Abilene (Smith, 1932).
 ELLSWORTH: County line W. Brookville (Smith, 1932).

NEBRASKA.

- GRANT: 3 mi. W. Duluth (Burt, August, 1931).

Liopeltis vernalis (Harlan)

A smooth, green snake was collected at Camp Ta-la-hi 4½ miles southeast of Cedarvale, Chautauqua county, Kansas, on July 29, 1932 (Hoyle).

Ophedryus æstivus (Linnæus)

These relatively uncommon green snakes may be found under rocks in prairie ledges in the early spring, but later they are most likely to be located in vegetation, especially in shrubs and trees.

KANSAS.

- CHAUTAQUA: 4 mi. S. E. Cedarvale at Camp Ta-la-hi (Hoyle, July 24, 1932).
 COWLEY: 5 mi. N. E. Arkansas City (Hoyle, July 6, 1931); 11 mi. S. E. Winfield (Hoyle, May 23, 1933); 7 mi. N. E. Winfield (Gerboth, April 12, 1933).

Coluber constrictor flaviventris Say

A blue-black phase of this subspecies, which offered a colorational approach to the eastern *constrictor*, was secured in Rogers county, Oklahoma, on April 4, 1933. Upon dissection, it was found to have an adult male collared lizard (*Crotaphytus collaris*) in its stomach.

KANSAS.

- CHASE: 5 mi. N. Strong City (Burt, May 12, 1933).
 CHEROKEE: 3 mi. N. Baxter Springs (Taylor and Smith, April 14, 1931).
 CLARK: 4 mi. N. Englewood (Smith, July 24, 1933).
 CLOUD: Miltonvale (Smith, April 8, 1933).
 COFFEY: Lebo (Burt, June 3, 1933).

- COWLEY: 3 mi. E. Cambridge (Burt, June 3, 1933).
 ELK: 2 mi. N. W. Grenola (Horace Lyon, May 31, 1933); 3 mi. N. W. Oak Valley (Burt, April 22, 1933).
 ELLSWORTH: 3 mi. E. Ellsworth (Hoyle, May 14, 1933).
 GREENWOOD: 6 mi. S. Tonovay (Burt, June 3, 1933).
 HARPER: 5 mi. S. W. Harper (Tihen, August 25, 1933).
 JEWELL: 3 mi. S. E. Mankato (Hoyle, May 14, 1933).
 LINCOLN: 10 mi. S. W. Lincoln (Burt, May 14, 1933).
 POTTAWATOMIE: 2 mi. N. Westmoreland (Smith, April 9, 1933).
 SUMNER: Argonia (Tihen, August 23, 1933).
 WABAUNSEE: 1 mi. N. E. Alma (Hoyle, May 13, 1933); 7 mi. N. Alma (Burt, May 13, 1933).

MISSOURI.

- JASPER: 6 mi. S. W. Blue Springs (Long, September 11, 1932).

NEBRASKA.

- CHERRY: 3 mi. S. E. Valentine (McGrew, July, 1933).
 NEMAHA: 6 mi. W. Johnson (Burt, June, 1931).

OKLAHOMA.

- KAY: 6 mi. S. E. Chilocco (Hoyle, April 29, 1933).
 ROGERS: 6 mi. W. Claremore (Burt, April 23, 1933).

WYOMING.

- GOSHEN: 1 mi. S. E. Torrington (Burt, August 17, 1931).

Coluber flagellum flagellum Shaw

Kansas specimens of this subspecies occur about both open and wooded prairie ledges. The head and neck are deep blackish-brown, with the body becoming lighter posteriorly, and there may be poorly defined blotches on the back of some specimens.

KANSAS.

- CHAUTAUQUA: 1 mi. E. Cedarvale (Gerboth, April 3, 1933).
 COWLEY: 2 mi. N. W. Cameron (Burt, May 6, 1933); 7 mi. S. E. Winfield (Hoyle, April 18, 1933); 10 mi. E. Winfield (Hildinger, May 15, 1933).

MISSOURI.

- PHELPS: 4 mi. N. E. Arlington (Burt, August 31, 1933).
 PULASKI: 3 mi. E. Waynesville (Burt, August 31, 1933).

OKLAHOMA.

- KAY: 6 mi. N. E. Newkirk (Burt, April 29, 1933).

Coluber flagellum flavigularis (Hallowell)

A prairie whipsnake with the preanal plate abnormally divided was found in Beckham county, Oklahoma, on June 10, 1933.

KANSAS.

- BARBER: 1 mi. S. W. Aetna (Smith, September 6, 1933).
 CLARK: Englewood (Hink, September 15, 1933).
 SUMNER: Argonia (Tihen, August 23, 1933).

OKLAHOMA.

- BECKHAM: 4 mi. S. W. Sayre (Hoyle, June 10, 1933).

Elaphe læta (Baird and Girard)

The young of this harmless prairie snake mimics like-sized individuals of the dwarf prairie rattlesnake (*Sistrurus catenatus catenatus*), which lives in the same general habitat, but to a careful observer differences (such as the presence or absence of a rattle and variation in the shape of the pupil of the eye) are

obvious. Mimicry is evidenced in the young of these two snakes by (1) the common possession of a shortened body, by (2) the exhibition of a series of dorsal blotches or saddles on a lighter background, and especially by (3) the extension of a conspicuous dark band through the eye. The same general idea of mimicry is conveyed by the resemblance of *Lampropeltis calligaster* to *Sistrurus*, but in this case the body of the former snake is slender enough to give a more definite off-hand clue as to its identity.

In Comanche county, Kansas, an *Elaphe læta* was secured in a gypsum cave, where it was hanging to slight irregularities of the roof.

KANSAS.

BARBER: 4 mi. S. Sun City in Dancer's Cave (Smith, September 4, 1933).

CHASE: 5 mi. N. Strong City (Burt, May 12, 1933).

COMANCHE: 2 mi. W. Aetna (Smith, September 7, 1933).

ELK: 2 mi. N. W. Grenola (Harold Lyon, July 31, 1933).

ELLIS: Hays (Brown, April, 1932).

JEWELL: 3 mi. S. E. Mankato (Burt, May 14, 1933).

LABETTE: Labette Ozarks near Mortimer (Hoyle, April 22, 1933).

OTTAWA: Ada (Smith, April 8, 1933).

SEDGWICK: Clearwater (Whitney, September 15, 1933).

OKLAHOMA.

GRANT: 1 mi. E. Medford (Hoyle, June 9, 1933).

Elaphe obsoleta (Say)

The supposed subspecies of this snake, *obsoleta* and *confinis*, appear to be Mendelian varieties at best, and there is a definite tendency for the production of more individuals of the *confinis* type in the young and the intermediate-sized females, as compared with the adult males, so ontogenetic blending exists and sexual dimorphism appears to influence the time of this transition. Extensive collecting experience has shown that (1) there is no habitat differentiation between the two varieties, that (2) they occupy the same range, and (3) that they show no evident contrasts in habits.

A moderate-sized female of this species (exhibiting the *confinis* color pattern) was discovered in the cupola of a barn near Grenola, Kan., on July 29, 1933. It was eating eggs from the nest of an English Sparrow (*Passer domesticus*). Later, the finding of the remains of an adult sparrow in the stomach of the snake indicated that the mother had possibly preceded her eggs in furnishing prospective nourishment to the snake.

KANSAS.

COWLEY: 2 mi. N. E. New Salem (Anderson, May 17, 1933).

ELK: 2 mi. N. W. Grenola (Hoyle, July 29, 1933); 3 mi. N. W. Oak Valley (Burt, April 22, 1933).

MARSHALL: 1 mi. E. Waterville (Burt, June, 1931).

POTTAWATOMIE: 4 mi. N. W. Olsburg (Hoyle, May 15, 1933).

SEDGWICK: 6 mi. W. Clearwater (Johnson, October, 1932).

MISSOURI.

JACKSON: Independence (Long, August 27, 1932).

MONROE: 3 mi. W. Lakenan (Burt, June 4, 1933).

Elaphe vulpina (Baird and Girard)

This snake is a typical inhabitant of the rolling prairie habitat that is so characteristic of the Upper Mississippi River Basin (above the Missouri river system). The coloration of this form resembles that of the southwestern *læta*.

ILLINOIS.

LA SALLE: 3 mi. E. Marseilles (Burt, June 9, 1931); 4 mi. E. La Salle (Burt, June 9, 1931).

WILL: 4 mi. N. Beecher (Burt, June 7, 1933).

IOWA.

BUCHANAN: 2 mi. E. Jesup (Burt, June 10, 1931).

UNION: 2 mi. E. Thayer (Burt, June 10, 1931).

NEBRASKA.

BURT: 3 mi. N. E. Lyons (Burt, June 2, 1931).

Arizona elegans elegans Kennicott

One of these snakes was secured 6 miles east of Erick, Beckham county, Oklahoma, on June 10, 1933 (Hoyle), in a sandy, sage-brush country. A second individual was taken 5 miles northeast of Canute, Washita county, Oklahoma (Hoyle, June 9, 1933), where it was in pasture land above a large lake. The first individual was a female with 10 large eggs in the right oviduct and none in the left.

Pituophis sayi sayi (Schlegel)

Bullsnakes are common in the prairie region of the Middle West, where they frequent areas of grassland, alfalfa and clover fields, cornfields, and cultivated areas in general. They are found not only in the less arid parts of the sandhills of Nebraska and South Dakota, but also in the irrigated lands of Wyoming, which lie immediately adjacent to extensive sage-brush desert.

The fine series of these snakes from Wyoming, listed below, has been carefully compared with examples from more eastern localities and there seems to be no ground for the taxonomic separation of the two adjacent populations. Even the most western examples from Wyoming have the rostral set well back between the internasals. The Wyoming series exhibits the following variations: ventral scutes, 213-223; labials, 8-9/11-13; scale rows, 30-31 (30 only once); dorsal saddles, 58-72. The scale rows of eastern examples are usually 28 to 30 in number, in contrast to the higher indication for those from Wyoming. The coloration is about the same throughout the range of *sayi*, but a tendency toward a decrease in the size and number of the dark markings on the ventral scutes is observed in western specimens. In this connection, an example from Sheridan county, Nebraska, is entirely devoid of dark ventral markings.

Two adult females from Butler county, Kansas, were found to contain large eggs in the oviducts on June 26, 1931, one having five eggs and the other double that number. A specimen collected in Chase county, Kansas, on May 12, 1933, had a young black-eared jack rabbit (*Lepus californicus melanotus*) in its stomach.

ILLINOIS.

HENRY: 4 mi. S. Cleveland (Burt, June 8, 1931).

IOWA.

JASPER: 1 mi. E. Colfax (Burt, June 8, 1931).

PAGE: 2 mi. W. Clarinda (Burt, June 8, 1931).

KANSAS.

BARBER: Deerhead (Smith, September 7, 1933); 2 mi. W. Medicine Lodge (Rogers, October 16, 1933); Sharon (Smith, September 7, 1933).

BUTLER: Augusta (Burt, June 26, 1931); 1 mi. S. W. Cassoday (Burt, May 12, 1933); 3 mi. S. E. Douglas (Burt, June 26, 1931).

- CHASE: Bazaar (Hoyle, May 12, 1933).
 COWLEY: 1 mi. S. Akron (Hoyle, August 27, 1933); 1 mi. E. Arkansas City (Burt, May 6, 1933); 2 mi. N. E. Burden (Harold Lyon, July 17, 1933); 6 mi. E. Cambridge (Burt, June 3, 1933); 1 mi. N. Hooser (Hoyle, August 17, 1933); 10 mi. E. Winfield (Anderson, May 8, 1933); 8 mi. N. Winfield (Burt, June, 1931).
 DICKINSON: 3 mi. N. Elmo (Burt, May 15, 1933); 2 mi. S. W. Hope (Hoyle, May 14, 1933).
 ELLSWORTH: County line W. Brookville (Smith, 1932).
 GEARY: 4 mi. S. Junction City (Burt, June, 1931).
 GREENWOOD: 2 mi. S. E. Climax (Burt, June 3, 1933); 8 mi. S. Tonovay (Burt, June 3, 1933).
 HARPER: Harper (Tihen, August, 1933).
 JEFFERSON: 1 mi. N. Rock Creek (Burt, June 3, 1933); 4 mi. S. Valley Falls (Burt, June 3, 1933).
 MARSHALL: 2 mi. W. Blue Rapids (Burt, June 23, 1931); 3 mi. N. Marysville (Burt, June, 1931).
 MORRIS: 3 mi. E. Delavan (Hoyle, May 14, 1933).
 OSAGE: 3 mi. N. Osage City (Burt, May 14, 1933).
 RILEY: 5 mi. W. Cleburne (Burt, June 25, 1931).
 SALINE: 4 mi. S. E. Mentor (Hoyle, May 14, 1933).
 SUMNER: Argonia (Burt, October 14, 1933).
 WABAUNSEE: 5 mi. W. Maplehill (Hoyle, May 13, 1933).
 WASHINGTON: 1 mi. S. Greenleaf (Burt, June 23, 1931).

NEBRASKA.

- CHERRY: Simeon (Burt, August 18, 1931).
 DODGE: 4 mi. S. E. Schribner (Burt, June 10, 1931).
 GAGE: Blue Springs (Burt, August 30, 1932); 1 mi. S. W. Cortland (Burt, August 9, 1933); 7 mi. E. Odell (Burt, May 15, 1933).
 JEFFERSON: 6 mi. E. Reynolds (Hoyle, May 15, 1933).
 KNOX: 1 mi. W. Niobrara (Burt, August 11, 1933).
 LANCASTER: Lincoln (Univ. Nebr. Mus., June 11, 1920).
 MORRILL: 5 mi. S. W. Bonner (Burt, August 17, 1931).
 SHERIDAN: 4 mi. E. Bingham (Burt, August 17, 1931).

OKLAHOMA.

- GARFIELD: 5 mi. N. Enid (Hoyle, June 9, 1933).

SOUTH DAKOTA.

- MELLETTTE: 9 mi. E. Cedarbutte (Burt, August 10, 1931).
 TRIPP: 5 mi. S. E. Witten (Burt, August 10, 1931).

WYOMING.

- BIGHORN: 3 mi. N. Basin (Burt, August 16, 1931).
 CONVERSE: 6 mi. W. Careyhurst (Burt, August 17, 1931); 2 mi. W. Glenrock (Burt, August 17, 1931).
 FREMONT: 3 mi. N. W. Diversion Dam (Burt, August 13, 1931).
 JOHNSON: 16 mi. S. Buffalo (Burt, August 16, 1931).

Lampropeltis calligaster (Harlan)

A note on the mimicry of the young of this species to like-sized prairie rattlesnakes (*Sistrurus catenatus catenatus*) is given above under *Elaphe laeta*.

ARKANSAS.

- POPE: 5 mi. N. W. London (Burt, June 28, 1931).

KANSAS.

- BUTLER: 4 mi. W. Leon (Smith, September 9, 1933).
 CHASE: 2 mi. W. Cottonwood Falls (Smith, September 1, 1933).
 CHAUTAUQUA: 1 mi. E. Cedarvale (Hoyle, May 6, 1933).
 COWLEY: 4 mi. S. E. Hooser (Burt, May 6, 1933).

- ELK: 2 mi. N. W. Grenola (Hoyle, September 8, 1933).
 HARPER: 1 mi. N. Harper (Tihen, August 31, 1933).
 MONTGOMERY: Independence (Robb, July 6, 1933).
 MORRIS: 6 mi. E. Council Grove (Burt, May 14, 1933).
 POTTAWATOMIE: Onaga (Smith, April 8, 1933).
 SEDGWICK: Clearwater (Whitney, October 10, 1933); 3 mi. N. W. Clearwater
 (Peterson, April, 1933).
 WABAUNSEE: 5 mi. W. Maplehill (Hoyle, May 13, 1933).

MISSOURI.

- PHELPS: 6 mi. W. Rolla (Burt, August 31, 1933).

OKLAHOMA.

- KAY: 6 mi. N. E. Newkirk (Hoyle, April 29, 1933).

Lampropeltis getulus holbrooki Stejneger

This snake inhabits both sparsely wooded tracts and the open prairie, where it is especially apt to occur about rock ledges.

KANSAS.

- CLAY: Clay Center (Smith, April 9, 1933).
 COWLEY: 10 mi. E. Winfield (Strother, May 8, 1933); 9 mi. N. E. Winfield
 (Burt, May 7, 1933).
 WABAUNSEE: 5 mi. W. Maplehill (Hoyle, May 13, 1933).

OKLAHOMA.

- KAY: 6 mi. N. E. Newkirk (Burt, April 29, 1933).
 ROGERS: 6 mi. W. Claremore (Burt, April 23, 1933).

Lampropeltis triangulum gentilis (Baird and Girard)

This beautiful king snake often occurs in the vicinity of the limestone ledges of the treeless prairie in central Kansas, where it is in much the same habitat as *Crotaphytus collaris*.

KANSAS.

- CLAY: Clay Center (Smith, April 9, 1933).
 CLOUD: Miltonvale (Smith, April 8, 1933).

NEBRASKA.

- LANCASTER: Lincoln (Wolcott, May, 1897).

OKLAHOMA.

- BECKHAM: 2 mi. E. Sayre (Hoyle, June 10, 1933).

Lampropeltis triangulum sypila (Cope)

In Kansas, this subspecies appears in the same general habitat as *gentilis*. An example was obtained under a flat limestone rock in a prairie ledge 7 miles north of Alma, Waubunsee county, on May 13, 1933.

Sonora semiannulata Baird and Girard

This snake appears to inhabit relatively dry areas in the prairie, as compared with such reptiles as *Eumeces obsoletus* and *Tantilla gracilis gracilis*, although it may occur with these forms in marginal zones near woods where a moderate amount of moisture is available. *Sonora* is often abundant in local areas in prairie ledges in the spring, but it seems very difficult to secure specimens at other times of the year.

An example from Cowley county, Kansas, is abnormal in that the loreal is fused to the prefrontal on each side.

KANSAS.

COWLEY: 7 mi. N. E. Winfield (Hoyle, May 21, 1933).

WILSON: 4 mi. W. Neodesha (Burt, April 22, 1933).

OKLAHOMA.

LOGAN: 2 mi. N. Mulhall (Burt, April 15, 1932).

NOBLE: 3 mi. N. Orlando (Burt, April 15, 1932).

OSAGE: 2 mi. S. E. Avant (Hoyle, April 23, 1933); 4 mi. W. Pawhuska (Burt, April 3, 1933).

ROGERS: 6 mi. W. Claremore (Burt, April 23, 1933).

Natrix grahamii (Baird and Girard)

This watersnake may be taken, now and then, under rocks at the side of riffles in the streams of eastern Kansas, where it is usually less abundant than *sipedon* of the same general habitat.

KANSAS.

OSAGE: 2 mi. S. Barclay (Burt, June 3, 1933).

NEBRASKA.

LANCASTER: 4 mi. E. Havelock (Powell, July, 1931); Lincoln (Univ. Nebr. Mus., July 14, 1930).

Natrix rhombifera (Hallowell)

One of these snakes was found at the side of a shallow roadside ditch near a garden and above a culvert in Labette county, Kansas, on April 22, 1933. When discovered it had only the top of its head and its eyes above the surface of the water. The head was seized and the snake attempted to withdraw into a shallow tunnel in the earth. Failing in this it made an effort to disconcert its captor by the use of its nauseating odoriferous secretion as it wound about his arm.

KANSAS.

COWLEY: 7 mi. N. E. Winfield (Anderson, April 22, 1933).

GREENWOOD: 6 mi. S. Tonovay on Fall river (Burt, June 3, 1933).

LABETTE: Montana (Burt, April 22, 1933).

Natrix sipedon sipedon (Linnæus)

When perched upon roots, brush or grapevines above the water of small streams, these snakes are afforded a high degree of protective coloration, and such individuals are often discovered only when they rush into the water after their would-be observer makes too close an approach.

Rana pipiens often falls victim to this snake, and we have observed this *Natrix* with these frogs in their mouths on several different occasions. When first pierced by the sharp recurved teeth of the snake, *Rana* often gives forth a piteous cry, which is strikingly suggestive of the high pitched shriek of a human infant in terror and pain.

ARKANSAS.

MADISON: 3 mi. S. Delaney (Burt, June 28, 1931).

PERRY: 6 mi. W. Casa (Burt, June 29, 1931).

INDIANA.

WARREN: 2 mi. S. Carbondale on Fall creek (Burt, June 7, 1933).

IOWA.

MONROE: 2 mi. W. Albia (Burt, June 8, 1931).

KANSAS.

- CHASE: 5 mi. N. Matfield Green (Smith, September 9, 1933).
 COWLEY: 5 mi. N. E. New Salem (Hoyle, July 18, 1933).
 ELK: 2 mi. N. W. Grenola (Hoyle, August 22, 1933).
 ELLSWORTH: County line W. Brookville (Smith, 1932).
 GREENWOOD: 6 mi. S. Tonovay (Burt, June 3, 1933).
 MARION: 5 mi. S. Marion (Burt, May 15, 1933).
 MARSHALL: 2 mi. S. Blue Rapids (Nelson, August 1, 1933).
 OSAGE: 4 mi. N. Lyndon on Dragoon creek (Burt, June 3, 1933).
 OTTAWA: Ada (Smith, April 8, 1933).
 SALINE: 4 mi. W. Gypsum (Hoyle, May 14, 1933).
 SHAWNEE: Wakarusa river (Dunkle, May 16, 1933).

NEBRASKA.

- CHERRY: 3 mi. S. E. Valentine (McGrew, July, 1933).

Natrix sipedon transversa (Hallowell)

The alternation of the dorsal and lateral dark spots of this form is often irregular anteriorly, and the scale rows may be 23, as in the case of an example from Beckham county, Oklahoma. On the other hand, *Natrix sipedon sipedon* may have 25 scale rows (Cowley county, Kansas).

ARKANSAS.

- MADISON: 3 mi. S. Delaney (Burt, June 28, 1931).

KANSAS.

- CLARK: 4 mi. W. Englewood (Smith, July 23, 1933).
 COMANCHE: 16 mi. E. Ashland on Bluff creek (Smith, July 24, 1933).
 KINGMAN: Kingman (Tihen, August 20, 1933).

OKLAHOMA.

- BECKHAM: 4 mi. S. W. Sayre (Hoyle, June 10, 1933).

Storeria dekayi (Holbrook)

This snake apparently occurs only where moisture is fairly abundant, as in deeper woods.

KANSAS.

- CHEROKEE: 3 mi. N. Baxter Springs near Spring river (Taylor, April 4, 1931).
 SEDGWICK: 3 mi. S. Clearwater (Schreck, January, 1933).

Storeria occipito-maculata (Storer)

This species was revealed under a stone in a deeply wooded area near Spring river on April 4, 1931, at a point about 2 miles north of Baxter Springs, Cherokee county, Kansas (Smith).

Potamophis striatulus (Linnæus)

This little brown snake was taken under a rock in a prairie ledge near sparse woods 7 miles west of Bartlesville, Osage county, Oklahoma, on April 3, 1933.

Thamnophis lineatus (Hallowell)

The odoriferous secretion of this dwarf garter-snake resembles that of *parietalis*, which may occur in the same general habitat.

KANSAS.

- CLAY: Clay Center (Smith, April 9, 1933).
 DICKINSON: 4 mi. N. W. Herington (Hoyle, May 14, 1933).
 LINCOLN: 10 mi. S. W. Lincoln (Burt, May 14, 1933).

MONTGOMERY: 5 mi. N. E. Elk City (Burt, April 22, 1933).

POTTAWATOMIE: Wheaton (Smith, April 9, 1933).

SHAWNEE: Berryton (Dunkle, May 14, 1933); 8 mi. W. Topeka (Hoyle, May 13, 1933).

WABAUNSEE: 7 mi. N. Alma (Burt, May 13, 1933); 3 mi. S. E. Wabaunsee (Hoyle, May 13, 1933).

NEBRASKA.

LANCASTER: Lincoln (Keech, October, 1933).

OKLAHOMA.

KAY: 6 mi. S. E. Chilocco (Burt, April 29, 1933); 6 mi. N. E. Newkirk (Hoyle, April 29, 1933).

Thamnophis ordinoides vagrans (Baird and Girard)

Wanderer garter-snakes are apparently the most common form of *Thamnophis* in Wyoming and the present records indicate that the subspecies has a very wide distribution in this state, where it occurs near streams and ponds.

WYOMING.

CONVERSE: 7 mi. N. W. Douglas (Burt, August 16, 1931).

NIOBRARA: 2½ mi. N. Hat Creek Store on Hat creek, near bridge (Burt, August 12, 1931).

PARK: N. Fork Shoshone river in Shoshone National Forest, just E. entrance to Yellowstone National Park (Burt, August 15, 1931); 6 mi. E. Cody (Burt, August 15, 1931).

Thamnophis radix radix (Baird and Girard)

One of these garter snakes was discovered with a large frog (*Rana pipiens*) in its mouth in Rock county, Nebraska, but when disturbed, the snake dropped the crying frog and wriggled into a hole in a hard earthen bank, where it was safe. Meanwhile, the wounded frog dived into a nearby pool of water, fleeing from the scene of its near-disaster, and escaping from both the snake and a would-be collector.

KANSAS.

COMANCHE: 3 mi. S. E. Arrington (Smith, September 5, 1933).

COWLEY: 8 mi. N. Winfield (Hadley, May 8, 1932).

DICKINSON: 4 mi. N. W. Herington (Burt, May 14, 1933).

GREENWOOD: 3 mi. S. Madison (Burt, June 3, 1933).

WALLACE: Rhino Hill (Elias, May 29, 1933).

MISSOURI.

LINN: 4 mi. W. Laclede (Burt, June 4, 1933).

NEBRASKA.

CHERRY: Valentine (Burt, August 18, 1931).

MORRILL: 8 mi. E. Bayard (Burt, August 17, 1931).

PIERCE: 1 mi. N. Hadar (Burt, August 9, 1931).

ROCK: 2 mi. E. Bassett (Burt, August 19, 1931).

SCOTTS BLUFF: 3 mi. N. W. Morrill (Burt, August 17, 1931).

SHERIDAN: 3 mi. E. Lakeside (Burt, August 17, 1931); 2 mi. W. Ellsworth (Burt, August 17, 1931).

SOUTH DAKOTA.

JACKSON: Belvidere (Burt, August 10, 1931).

PENNINGTON: 2 mi. S. E. Caputa (Burt, August 11, 1931).

Thamnophis sauritus proximus (Say)

A female ribbon snake, which was collected in Greer county, Oklahoma, on June 10, 1933, had six eggs in the right oviduct and three in the left.

ARKANSAS.

DREW: 2 mi. S. Winchester (Burt, June 29, 1931).

KANSAS.

HARPER: 4 mi. N. and 8 mi. E. Harper (Tihen, August 23, 1933).

MISSOURI.

LINN: 4 mi. W. Laclede (Burt, June 4, 1933).

OKLAHOMA.

BECKHAM: 4 mi. S. W. Sayre (Hoyle, June 10, 1933).

COMANCHE: Wichita Mts. (K. S. C. Mus., July 13, 1931).

GREER: 4 mi. S. E. Mangum (Hoyle, June 10, 1933).

Thamnophis sirtalis parietalis (Say)

The light stripe of this form lies "anteriorly" on the second and third rows, if the count is made an inch or so back from the head. An example found in the road in Cowley county, Kansas, on a windy day (May 6, 1933) side-winded across the highway and flattened its body like the hog-nosed snakes, displaying much bad temper as it was approached. Most individuals are much more gentle, however, even at the time of capture.

In a hay field above a small sandhill stream near Wood Lake, Nebraska, one of these red-sided garter snakes was found with a frog (*Rana pipiens*) in its stomach; and a second example was obtained in a seine at a stagnant pool, which had much algæ at the bottom, in Custer county, South Dakota. Here, the snake was associated with various stages of the leopard frog (*Rana pipiens*) and with many larvæ of the tiger salamander (*Ambystoma tigrinum*).

KANSAS.

BUTLER: 5 mi. S. Augusta (Burt, May 16, 1933).

CLAY: Clay Center (Smith, April 9, 1933).

COWLEY: 1 mi. E. Cameron (Hoyle, May 6, 1933); 8 mi. N. E. Winfield (Hoyle, April 21, 1933).

DICKINSON: 4 mi. N. W. Herington (Hoyle, May 14, 1933).

ELK: 3 mi. W. Grenola (Harold Lyon, May 30, 1933).

LABETTE: Labette Ozarks near Mortimer (Burt, April 22, 1933).

MORRIS: 9 mi. S. W. Council Grove (Burt, May 12, 1933).

POTTAWATOMIE: Onaga (Smith, April 8, 1933); 1 mi. N. Westmoreland (Smith, April 9, 1933).

SHAWNEE: Wakarusa river (Dunkle, May 16, 1933).

MISSOURI.

BUCHANAN: 2 mi. S. Rushville (Burt, June 3, 1933).

NEBRASKA.

CHERRY: 7 mi. N. W. Wood Lake (Burt, August 18, 1931).

COLFAX: 5 mi. S. E. Clarkson (Burt, August 9, 1931).

GAGE: 2 mi. W. Odell (Hoyle, May 15, 1933).

GRANT: 3 mi. W. Duluth (Burt, August 18, 1931).

SCOTTS BLUFF: 3 mi. S. E. Henry (Burt, August 17, 1931).

WAYNE: 7 mi. N. Pilger (Burt, August 9, 1931).

SOUTH DAKOTA.

CUSTER: 4 mi. E. Pringle (Burt, August 11, 1931).

Tantilla gracilis gracilis Baird and Girard

While a specimen of the leopard frog (*Rana pipiens*) was being dissected in the laboratory, an examination of its stomach contents revealed a partially digested snake of this subspecies.

KANSAS.

CHASE: 2 mi. W. Cottonwood Falls (Smith, September 1, 1933); 5 mi. N. Strong City (Burt, May 12, 1933).

CHAUTAUQUA: 3 mi. W. Peru (Hoyle, April 3, 1933).

COWLEY: 1 mi. N. E. Cambridge (Hoyle, April 22, 1933); 1 mi. N. Maple City (Burt, May 6, 1933).

POTTAWATOMIE: 2 mi. N. E. Rocky Ford power plant (Hoyle, May 15, 1933).

WILSON: 4 mi. W. Neodesha (Gerboth, April 22, 1933).

OKLAHOMA.

CRAIG: 4 mi. S. W. Whiteoak (Burt, April 23, 1933).

KAY: 6 mi. S. E. Chilocco (Hoyle, April 29, 1933); 6 mi. N. E. Newkirk (Burt, April 29, 1933).

OSAGE: 2 mi. S. E. Avant (Hoyle, April 23, 1933); 7 mi. W. Bartlesville (Burt, April 3, 1933); 4 mi. W. Pawhuska (Burt, April 3, 1933).

ROGERS: 6 mi. W. Claremore (Hoyle, April 23, 1933).

Tantilla gracilis nigriceps Kennicott

This form was taken at Hays, Ellis county, Kansas, by Leo Brown in April, 1932.

Agkistrodon mokasen Beauvois

Copperhead snakes are often active on warm evenings just at sunset. A young specimen that measured 317 mm. in total length was kept in the laboratory without food for four months (October to February). An adult killed near Winfield was left lying near a rock quarry on August 1. Shortly afterward, the snake (which was cut into two pieces through the center) was handled by a little girl about five years of age, who received a definite bite from the head end. The victim was rushed to a doctor, but serious symptoms did not develop, and the patient was discharged after preliminary treatment for snake bite and continued observation.

KANSAS.

CHAUTAUQUA: 4 ¼ mi. S. E. Cedarvale at Camp Ta-la-hi (Hoyle, July 26, 1932).

CHEROKEE: 2 mi. N. Baxter Springs (Smith, March 25, 1932).

COWLEY: 10 mi. E. Winfield (Hoyle, August 1, 1933).

ELK: 3 mi. N. W. Grenola (Hoyle, August 23, 1933).

Sistrurus catenatus catenatus (Rafinesque)

One of these rattlesnakes was chased into a natural hole in the side of a rounded rock, and thereby it completely concealed itself. The rock was only about ten inches in diameter and the snake did not come from its shelter until the stone had been rolled over a number of times.

KANSAS.

COWLEY: 6 mi. N. Winfield (Hadley, May 8, 1932); 3 mi. N. E. Winfield (Hoyle, August 1, 1933).

Crotalus confluentus confluentus Say

Through the courtesy of Mr. L. M. Klauber, we are able to include a number of Kansas records in the list below from specimens that he has examined. An example from Fremont county, Wyoming, shows the following characters:

ventrals, 177; subcaudals 25; rattles, 10; scale rows, 25-25-19; labials, 14/15; dorsal saddles, 41 on the body and 9 on the tail, 50 in all.

KANSAS.

BARBER: 5 mi. S. Sun City (Smith, September 3, 1933).

CHEYENNE: (Gloyd).

COMANCHE: Arrington (Smith, September 5, 1933).

ELLIS: Fort Hays (Allen).

HODGEMAN: Jetmore (October 9, 1929).

NESS: (Gloyd, May 1, 1927).

THOMAS: Gem (Perkins, December 13, 1931).

TREGO: Castle Rock (Taylor, June 20, 1912).

SOUTH DAKOTA.

JACKSON: 10 mi. W. Kadoka (Burt, August 11, 1931).

WYOMING.

FREMONT: 8 mi. E. Moneta (Burt, August 13, 1931).

LITERATURE CITED

- ADAMS, LEVERETT ALLEN. 1933. An Introduction to the Vertebrates. John Wiley and Sons, New York. Pp. 1-414, text figs. 1-290.
- BERRY, EDWARD WILBER. 1929. Paleontology. McGraw-Hill Book Co., New York. Pp. 1-392, text figs. 1-175.
- OSBORN, HENRY FAIRFIELD. 1903. On the Primary Division of the Reptilia into Two Sub-classes, Synapsida and Diapsida. *Science*. 17:275-276.
- ROMER, ALFRED SHERWOOD. 1933a. Vertebrate Paleontology. Univ. Chicago Press. Pp. 1-491, text figs. 1-359.
- ROMER, ALFRED SHERWOOD. 1933b. Man and the Vertebrates. *Ibid.* Pp. 1-427, text figs. 1-278.
- STEJNEGER, LEONHARD, and THOMAS, BARBOUR. 1917. A Check List of North American Amphibians and Reptiles, ed. 1. Harvard Univ. Press, Cambridge. Pp. 1-125; 1923. *Ibid.*, ed. 2, pp. 1-171; 1933. *Ibid.*, ed. 3, pp. 1-185.
- WILLISTON, SAMUEL WENDELL. 1925. The Osteology of the Reptiles. Harvard Univ. Press, Cambridge. Pp. 1-300, text figs. 1-191.