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HERPETOFAUNA OF HARDEMAN COUNTY, TENNESSEE

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ABSTRACT

A study of distribution, taxonomy, and ecology of herpetofauna of Hardeman County, Tennessee, was conducted from the spring of 1968 through the autumn of 1971. Twenty-six species of amphibians (13 salamanders, 13 frogs and toads) and 45 species of reptiles (9 turtles, 8 lizards, 28 snakes) were collected in, or reported from, the county.

INTRODUCTION

Various investigators have reported limited collections of herptiles from Western Tennessee, that area of the state including all or part of 21 counties west of the Tennessee River (Troost, 1836, 1844; Rhoads, 1895; Blanchard, 1922; Dunn, 1926; Parker, 1937, 1939, 1947, 1948; Sinclair, 1950a, 1950b; Gentry, 1955, 1956). Parker (1948) conducted the most extensive work; he reported 78 taxa from Western Tennessee, including 23 species from Hardeman County. Nine additional species have been reported from the county (Gentry, 1955, 1956; Mittleman, 1946; Rossman, 1958).

The purpose of this study was to obtain data on distribution, taxonomy, and ecology of herptile species in Hardeman County, Tennessee (Figure 1). The study was conducted from the spring of 1968 through the autumn of 1971.

DESCRIPTION OF THE STUDY AREA

Hardeman County is located in the upper plateau region of southwestern Tennessee near the headwaters of the Big Hatchie River. The river provides the principal drainage for the area and flows through the county from the southeast to the northwest. The county contains 1,696 km² and has a mean elevation of 156 m. The northwestern portion of the county is in the West Tennessee Plain (Floyd, 1965); and geologic formations consist of sand, silt, gravel, and clay of Tertiary age. The remainder of the county is in the West Tennessee Uplands Province and consists of geologic formations of Cretaceous and Tertiary gravel, sand, silt, and clay. Much of the county is covered by a thin superficial layer of loess. The county is located in the oak-tuliptree-beech communities of the Western Mesophytic Forest Region of the Mississippi Embayment (Braun, 1950).

The area has a temperate continental climate with pronounced seasonal variations in both temperature and precipitation (Vaiksnoras, 1968). Dickson (1960) reported climatological data for Hardeman County: mean annual precipitation, 132 cm; mean temperatures, January max 52 F, January min 32 F, July max 92 F, July min 68 F. Precipitation is generally evenly distributed, although prolonged dry periods are common in summer and autumn. Local flash floods may occur during heavy thunderstorms.

MATERIALS AND METHODS

Collecting was done during all seasons of the year, both during the daytime and at night, and under a variety of weather conditions. Sample areas represented a variety of herptile habitats. Standard techniques for collecting, preserving, and storing specimens were employed (Conant, 1958; Martof, 1956). Representative specimens were deposited in the Memphis State University Museum of Zoology (MSUMZ). The study also included records of specimens in the Field Museum of Natural History, Chicago, the University of Michigan Museum of Zoology (UMMZ), the Memphis State University Museum of Zoology, the personal collections of Dr. Glenn Gentry and Mr. Malcolm Parker, and literature accounts of Hardeman County specimens.

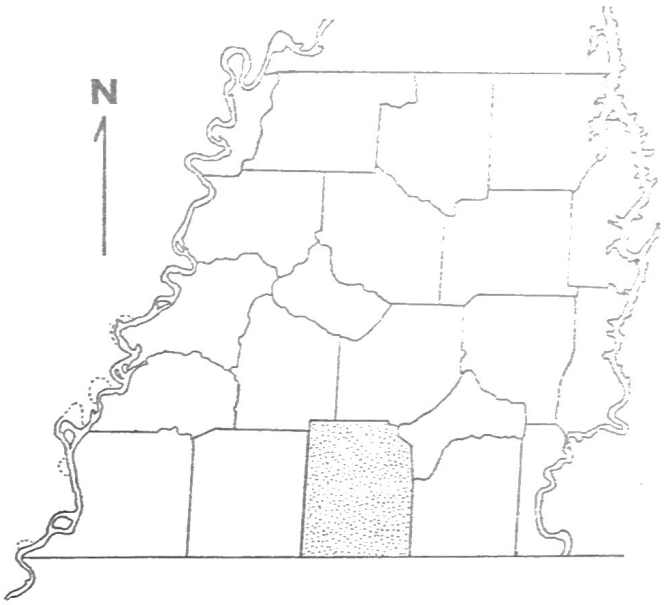

FIG. 1: *Location of Hardeman County in Western Tennessee.*

RESULTS AND DISCUSSION

During the study 26 species of amphibians (13 salamanders, 13 frogs and toads) and 45 species of reptiles (9 turtles, 8 lizards, and 28 snakes) were recorded. Total specimens deposited in the MSUMZ was 621; amphibians 446, and reptiles 175. Numerous additional specimens were observed or captured and then released. *Phrynosoma cornutum and Crotalus adamanteus,* although recorded from the county, were considered transports from their normal ranges. Apparent hybridization between two species of toads, and intergradation between two subspecies of turtles and two subspecies of snakes were noted.

ANNOTATED CHECK LIST OF AMPHIBIANS AND REPTILES OF HARDEMAN COUNTY, TENNESSEE

Scientific nomenclature follows the Catalogue of American Amphibians and Reptiles (1963 et seq.) and the working list of Species of the Herpetological Information Search Systems of the American Museum of Natural History (1970). Subspecific designation and

common names are those suggested by the American Society of Ichthyologists and Herpetologists (Conant, 1956), except for nomenclature changes made since the 1956 publication. These changes are in accord with the working list of the Herpetological Information Search Systems of the American Museum of Natural History (1970).

SPECIES COLLECTED IN, OR REPORTED FROM, THE COUNTY

Amphiuma tridactylum Cuvier, Three-toed Congo Eel. One specimen was unearthed during the construction of a dam. Another specimen was observed eating tadpoles of *Rana sp.* in a submerged burrow 90 to 120 cm from the shore of a pond in Muddy Creek Bottoms. Fishermen reported having caught them on hooks baited with *Ambystoma opacum* in sloughs and backwaters of the Hatchie River.

Necturus maculosus louisianensis (Rafinesque), Red River Waterdog. Fishermen reported that large numbers of waterdogs were caught in fish traps in the main channels of the Hatchie River inlets in 1970. In late November 1970, one male and one female were collected from these inlets.

Siren intermedia nettingi Goin, Western Lesser Siren. One specimen was collected in October 1969, buried in muck 3.7 m from a creek.

Notophthalmus viridescens louisianensis (Wolterstorff), Central Newt. In March 1969, a larval form was found in a small pool in a spring-fed stream. A second specimen, in the Red Eft stage, was taken in March 1970, from beneath a log in bottomland.

Ambystoma jeffersonianum (Green). Jefferson Salamander. Gentry (1955) reported a larval form of this species from Hardeman County, however the specimen was not available for examination. Most distribution maps do not show the range of this animal extending as far southward as Tennessee (Conant, 1958; Whitaker, 1968; Uzzell, 1967; Cochran and Goin, 1970). Bishop (1943) noted that, "Scattered records south of the general range may be *A. texanum* or some other species."

Ambystoma maculatum (Shaw), Spotted Salamander. The single specimen collected was unearthed during the construction of a dam.

Ambystoma texanum (Matthes), Small-mouthed Salamander. Two specimens were collected from humus near an old barn, and one was taken from beneath debris in bottomland.

Ambystoma opacum (Gravenhorst), Marbled Salamander. Relatively abundant, specimens were taken either from beneath rotting logs in swampy bottoms, or from under old boards near barns and outbuildings.

Desmognathus fuscus fuscus (Green), Northern Dusky Salamander. Common throughout the county, all specimens collected were taken from beneath leaf litter and boards at the edge of, or in, very shallow, trickling run-off from springs.

Two separate series of *D. fuscus* collected from southeastern Hardeman County closely resembled the holotypic description of *D. f. conanti* Rossman, Spotted Dusky Salamander. Rossman (1958) first described this subspecies and reported two specimens from the northeastern portion of the county; these specimens are in the Chicago Academy of Science Museum. General body size was similar to that of *D. f. fuscus*. A series of 12 specimens was collected in October 1968, in a shallow, clear, spring-fed stream which flowed through a 1.8 to 2.1 m natural tunnel; most smaller specimens were captured inside the darkened tunnel. Larval *Eurycea bislineata cirrigera* were taken at the same site. A second series of 10 specimens was collected in July 1969 along the edge of a clear spring in Cypress Creek Bottoms.

Plethodon glutinosus glutinosus (Green), Slimy Salamander. This is the most ubiquitous salamander in the county and was found in a wide variety of habitats.

Certain *P. glutinosus* collected during this study were distinct in appearance and behavior. They resembled *P. g. grobmani* Allen and Neill. Sinclair (1950b) reported specimens of *P. g. grobmani* from Shelby County, Tennessee, over 644 km from the previously known range (Georgia and Florida). All specimens collected were taken from beneath brush or leaf litter in damp, sandy humus. The ground color of the body was brownish-black sprinkled with iridescent bronze blue-green flecks; the head appeared gold-bronze in the light. *P. g. glutinosus* is black with white to grayish-white flecks scattered over the body. *P. g. grobmani* is very slender, does not jump like *P. g. glutinosus* and is not slimy like the latter. From 14 specimens collected, mean body measurements were: costal groove count 14.21; costal interspaces between the toes of adpressed limbs 1.14; snout to vent length 36.07 mm; tail length, computed on the basis of nine individuals with tails intact, 28.66 mm.

Pseudotriton ruber vioscai Bishop, Southern Red Salamander. One specimen was captured from beneath a log on a steep incline next to Cypress Creek. A second individual was taken at Rogers Springs Lake in a low seepage area adjacent to the lake.

Eurycea longicauda guttolineata (Holbrook), Three-lined Salamander. This abundant salamander was frequently found a considerable distance from water. It was often observed at night moving alongside roads or across the forest floor.

Eurycea bislineata cirrigera (Green), Southern Two-lined Salamander. This common species was captured in shallow, clear, running water, usually near the edge of a spring or stream and always close to roots, logs, or rocks.

Bufo americanus americanus Holbrook, American Toad. Found scattered throughout the county, all specimens captured during the daytime came from beneath logs, boards, and other debris in rich soil near barns. Those collected at night were taken from a breeding congress at Chickasaw State Park in April 1970, from water 60-75 cm deep near the weed-choked edge of Lake LaJoie. *Hyla cruicifer* was heard in the same area and *Acris gryllus* was taken at the edge of the water in a low grassy area. Hybridization with *B. woodhousei fowleri* occurs in the study area and five of the specimens exhibited characteristics of both species. These were included with the American Toad because they appeared to have a closer affinity to *B. a. americanus*.

Bufo woodhousei fowleri Hinckley, Fowler's Toad. One of the most numerous amphibians in the county, specimens were captured as they moved about during daylight and evening hours. Five specimens showed characters of *B. a. americanus*, but they more closely resembled *B. w. fowleri* and were therefore included with the latter.

Hyla cruicifer crucifer Wied, Northern Spring Peeper. In spring, the distinctive high piping call could be heard in most areas of the county. Specimens were common on emergent vegetation of lakes and ponds.

Hyla versicolor versicolor Le Conte, Eastern Gray Treefrog. This frog was relatively common in bottomlands. A breeding chorus was found in April 1969, in a small farm pond. A partially transformed *H. v. versicolor* was collected in June 1969, in a small, muddy stock pond. Current distribution maps for *H. v. versicolor* have been questioned by several investigators, and a proposal has been made that names *H. chrysoscelis* as the species occurring in Hardeman County (Blair, 1958; Johnson, 1961, 1966; Ralin, 1968). However, *H. v. versicolor* was the designation applied during this study.

Hyla avivoca avivoca Viosca, Western Bird-voiced Treefrog. One individual was heard calling in the flooded area below the dam at Rogers Springs Lake. Mr. M. Parker (personal communication) collected five specimens from button bush and lower portions of trees on a rainy night in May 1948, in the Hatchie Bottoms.

Hyla cinerea cinerea (Schneider), Green Treefrog. Familiar to many throughout the county, this frog does not occur in large numbers. One specimen was captured at night in a honeysuckle thicket on a ridge above a ravine.

Gastrophryne carolinensis carolinensis (Holbrook), Eastern Narrow-mouthed Toad. Several specimens were collected in June from beneath boards or rotting logs near farm ponds. A breeding congress was discovered at Pruitt Lake the night of 24 June 1969.

Acris gryllus gryllus (Le Conte), Southern Cricket Frog. This frog was common throughout the county.

Acris crepitans crepitans Baird, Northern Cricket Frog. Found throughout the county, these tiny frogs present a problem in identification where they are sympatric with *A. gryllus*, since the two species are morphologically similar. Habitat separation was observed in cricket frogs collected at Rogers Springs Lake. *A. c. crepitans* was always found in the water close to shore, or on nearby vegetation. *A. g. gryllus* was found in well-drained areas and temporary roadside pools near the lake. *A. c. crepitans* was more numerous than *A. g. gryllus* in places where both occurred.

Pseudacris triseriata feriarum (Baird), Upland Chorus Frog. In March and April 1969 and 1970, nearly every roadside ditch and large puddle of water contained at least one pair of these little frogs. During the summer months they were rarely seen.

Rana pipiens sphenocephala Cope, Southern Leopard Frog. This frog was frequently found in association with *R. clamitans clamitans*. It was often observed in pools and in grassy ditches filled with water.

Rana clamitans clamitans Latreille, Bronze Frog. A common frog, this animal was observed, and its distinctive low-pitched call was heard throughout the county. At Pruitt Lake in Bolivar, *R. c. clamitans* was collected from the south and northwest banks but was not found along the northeast portion of the lake bank where a breeding colony of *Gastrophryne* was located.

Rana catesbeiana Shaw, Bullfrog. This frog was very abundant in areas of the county. They were most frequently encountered in bottomlands of the Hatchie River and in the numerous creeks, ponds, and lakes.

Macrochelys temmincki (Troost), Alligator Snapping Turtle. One specimen was collected in muddy shallows adjacent to Mill Pond in Hatchie Bottoms.

Chelydra serpentina serpentina (Linnaeus), Common Snapping Turtle. This ubiquitous turtle, used for food by many persons in the county, reaches considerable size, particularly in more isolated bottomland areas.

Sternotherus odoratus (Latreille), Stinkpot. Common inhabitants of creek bottoms in Hardeman County, these turtles were rarely found basking in the sun. A specimen was captured in a turtle trap baited with sour cottonseed meal.

Kinosternon subrubrum subrubrum (Lacepede), Eastern Mud Turtle. This small turtle was common in lakes and creeks. The head of this subspecies is mottled with greenish-yellow and lacks stripes. However, one specimen, collected after a heavy rainstorm as it crossed a road near a flooded pasture, had a pair of yellowish postorbital head stripes which extended onto the neck. This is the distinguishing field mark of *K. s. hippocrepis* Gray, Mississippi Mud Turtle.

Graptemys pseudogeographica ouachitensis Cagle, Ouachita Map Turtle. A common turtle of sloughs and backwaters of the Hatchie River, large numbers of these reptiles were observed sunning themselves on logs and other floating objects.

Chrysemys picta dorsalis Agassiz, Southern Painted Turtle. Juvenile individuals were observed at Rogers Springs Lake.

Chrysemys scripta elegans (Wied), Red-eared Turtle. One of the most numerous turtles in the county, it was abundant in lakes and sloughs throughout the area. These were easily taken in traps baited with cheese.

Terrapene carolina carolina (Linnaeus), Eastern Box Turtle X *T. c. triunguis* (Agassiz), Three-toed Box Turtle. Box turtles were abundant throughout the county. All specimens collected appeared to be intergrades between *T. c. carolina* and *T. c. triunguis* and did not consistently possess characteristics distinctive of either subspecies.

Trionyx spiniferus Le Sueur, Spiny Softshell Turtle. This turtle rarely leaves the water and is difficult to catch. Several were observed in Porters Creek. Accord-

ing to Webb (1973) Hardeman County is in the area of intergradation between *T. s. spiniferus* Le Sueur and *T. s. aspar* (Agassiz).

Anolis carolinensis carolinensis Voigt, Carolina Anole. Reliable reports of this lizard came from Essary Springs in the southeastern part of the county. No specimens were taken during this study; however, there is a specimen from Hardeman County in the UMMZ.

Sceloporus undulatus hyacinthinus (Green), Northern Fence Lizard. Common throughout the county, it was frequently seen on and near roads throughout the county, and at old sawmill sites. Specimens were collected from beneath logs and boards in cool evening and morning hours from late spring through early autumn.

Phrynosoma cornutum (Harlan), Texas Horned Lizard. This lizard is mentioned in the earliest accounts of Tennessee reptiles (Troost, 1836, 1844). Endsley (1954) reported "one or two" specimens from Chester County, which is adjacent to Hardeman County. The senior author collected one in Shelby County in 1960. Although not collected during this study, there were reliable reports of this species from Piney Creek Bottoms and from near Middleton. This lizard is not native to Tennessee; the nearest portion of its range is western Arkansas (Schmidt, 1953). Records of occurrence are considered to be based on individuals transported from their native range.

Scincella laterale (Say), Ground Skink. These reptiles were most often collected near barns, and from under leaf litter in forest. A gravid female was taken from beneath leaves late in the afternoon in June 1969. It was kept alive and fed ant pupae and termites. It laid five eggs during the first week in July 1969, all of which hatched in late August.

Eumeces fasciatus (Linnaeus), Five-lined Skink. A common lizard of the county, it was often found around woodpiles, old barns, and frequently in pine forest beneath logs.

Eumeces laticeps (Schneider), Broad-headed Skink. Extremely wary lizards, difficult to capture, these animals were observed in several areas of the county and were collected from beneath the bark of rotting trees or stumps.

Cnemidophorus sexlineatus sexlineatus (Linnaeus), Six-lined Racerunner. These animals were found in and around woodpiles and near sawmill sites throughout the county.

Ophisaurus attenuatus longicaudus McConkey, Eastern Slender Glass Lizard. At the time Smith (1946) published his Handbook of Lizards, only one species, *O.ventralis*, was recognized from North America. Now three species of glass lizards are recognized in the eastern United States. Most current sources indicate *O. attenuatus* as the Tennessee form (Schmidt, 1953; Conant, 1958, Huheey and Stupka, 1967; Blair, et al., 1968; Whitaker, 1968; Cochran and Goin, 1970). A specimen labeled *O. ventralis* in the UMMZ (97435), taken in 1935 at Bolivar, was examined and identified as *O. attenuatus longicaudus*. *O. ventralis* specimens reported from dry locations in Hardeman County (Gentry, 1956) were unavailable for verification during this study and the identification is questioned. All four glass lizards collected during this study were *O. a. longicaudus*.

Virginia striatula (Linnaeus), Rough Earth Snake. One specimen was collected from grass along a fence row.

Virginia valeriae elegans Kennicott, Western Earth Snake. Apparently more numerous in the county than *V. striatula*, specimens were collected in pastures, on roads, and from under boards.

Storeria occipitomaculata occipitomaculata (Storer), Northern Red-bellied Snake. One specimen was collected from beneath a fallen tree limb in June 1970. During the last week of August 1970, it gave birth to three live young.

Storeria dekayi wrightorum Trapido, Midland Brown Snake. This small snake was most often found in towns around building foundations, flower beds, and fence rows.

Natrix sipedon pleuralis Cope, Midland Water Snake. Mr. M. Parker collected one specimen in the Hatchie River Bottoms in 1949. *N.s. pleuralis* was observed in Cypress Creek during this study.

Natrix erythrogaster flavigaster Conant, Yellow-bellied Water Snake. This common snake was present in nearly every lake and large pond. The specimens collected were taken at night in or near water. Parker (1947) reported *N. e. erythrogaster* (Forster), Red-bellied Water Snake from Hardeman County. According to Conant (1958) the northwestern range limit of *N. e. erythrogaster* is several hundred kilometers southeast of Hardeman County.

Natrix rhombifera rhombifera (Hallowell), Diamond-backed Water Snake. This snake is a common inhabitant of ponds, creeks, lakes, and swampy bottomlands. Specimens collected were taken at night from water or from near the water's edge.

Thamnophis sirtalis sirtalis (Linnaeus), Eastern Garter Snake. Found throughout the county, this snake was observed and collected from creek culverts, near ponds, and from cultivated fields.

Thamnophis proximus proximus (Say), Western Ribbon Snake. Parker (1948) reported this species from the county. No specimens were observed during this study.

Farancia abacura reinwardti Schlegel, Western Mud Snake. These fossorial snakes were most often found in cultivated bottomlands during plowing season.

Heterodon platyrhinos platyrhinos Latreille, Eastern Hognose Snake. This snake occurred throughout the county; both light and dark color phases were present.

Carphophis amoenus helenae (Kennicott), Midwest Worm Snake. One of these small fossorial snakes was collected from beneath a log in a poorly drained, wooded, bottomland area grazed by cattle.

Diadophis punctatus stictogenys Cope, Mississippi Ringneck Snake. This common, secretive snake was collected from under debris near farm buildings.

Coluber constrictor constrictor Linnaeus, Northern Black Racer. The black racer is a common snake throughout the county, more abundant in upland areas than in the lowlands.

Masticophis flagellum flagellum (Shaw), Eastern Coachwhip. This reptile was common throughout the county. A den with four or five individuals was observed in a dry, well-drained, open upland area near Rogers Springs Lake.

Opheodrys aestivus (Linnaeus), Rough Green Snake. Specimens were common throughout the county and were observed in areas of roadside bushes and shrubs.

Elaphe obsoleta spiloides Dumeril, Bibron, and Dumeril, Gray Rat Snake. One of the most common snakes in the county, it was most abundant in areas near farm buildings.

Elaphe guttata guttata (Linnaeus), Corn Snake. The corn snake, common throughout most of the county, was found beneath debris, in and near dumps, around outbuildings and barns, and particularly near corn cribs.

Cemophora coccinea (Blumenbach), Scarlet Snake. A specimen was collected in May 1965, beneath leaf litter in mixed hardwoods near Middleton.

Lampropeltis triangulum elapsoides (Holbrook), Scarlet Kingsnake. Apparently rare in the county, the one specimen obtained was taken near Bolivar several years ago.

Lampropeltis getulus niger (Yarrow), Black Kingsnake X *L. g. holbrookii* Stejneger, Speckled Kingsnake. This species was commonly found in grassy fields, woodlands, and near lakes. Six specimens were collected, three of which appeared to be intergrades; these exhibited light dots on most of the dorsal scales and faint traces of a chain pattern over the dorsum. Two specimens had distinct chain patterns over the dorsum and a few light dots on the intervening scales, which is characteristic of *L. g. niger*. One specimen lacked any traces of a chain pattern and exhibited the characteristic speckled pattern of *L. g. holbrookii*.

Tantilla coronata coronata Baird and Girard, Southeastern Crowned Snake. Two of these secretive snakes were taken in rolling fields near a stream in Bolivar. Another specimen was found on a hillside in an area of mixed pine and hardwoods.

Agkistrodon contortrix contortrix (Linnaeus), Southern Copperhead. This ubiquitous snake was common throughout the county. Specimens were found near woodpiles, in fields, and in woodlands. Large numbers of road kills were also observed.

Agkistrodon piscivorus leucostoma (Troost), Western Cottonmouth. These reptiles were most often found in bottomlands and sloughs of the Hatchie River. December 24, 1955, was the latest date of the year, on record, noting activity of the cottonmouth in Hardeman County; the weather had been unseasonably warm and the snake was very sluggish.

Sistrurus miliarius streckeri Gloyd, Western Pigmy Rattlesnake. A single specimen was collected from a yard near a pine woods.

Crotalus horridus atricaudatus Latreille, Canebrake Rattlesnake. Although not collected during this study, there were two reliable accounts of this species from wooded areas of the county. A female, approximately 1.5 m long, and several 15-cm long young were killed in July 1957, and a 1.5 m long specimen was killed in August 1957.

Crotalus adamanteus Beauvois, Eastern Diamondback Rattlesnake. One very thin specimen was killed in November 1963, on a woodpile. This specimen, collected near Bolivar, was far from the recorded range (Conant, 1958). This record is considered to be based on an individual transported from its native range.

Additional Taxa Reported from Adjacent Counties

Ambystoma talpoideum (Holbrook), Mole Salamander. Endsley (1954) recorded *A. talpoideum* from bottomlands in Chester County. Several specimens collected from Benton County, Mississippi, 8 km south of the Hardeman County line, are in the U. S. National Museum and in the MSUMZ.

Scaphiopus holbrookii holbrookii (Harlan), Eastern Spadefoot. Endsley (1954) reported a few of these fossorial toads from a rain pool in Henderson, Chester County, approximately 3.2 km from the northeastern boundary of Hardeman County.

Lampropeltis calligaster calligaster (Harlan), Prairie Kingsnake. This snake was reported from Madison County (Parker, 1939), and from Chester County (Parker, 1947).

Lampropeltis calligaster rhombomaculata (Holbrook). Mole Snake. This snake was reported from Chester County by Endsley (1954).

Thamnophis sauritus sauritus (Linnaeus), Eastern Ribbon Snake. Rossman (1970) listed the species as apparently rare in much of the interior of the eastern United States. Endsley (1954) reported a specimen from Chester County.

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In Memoriam

WALTER FRANKLIN POND (1885-1974)

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Walter F. Pond, former Tennessee State Geologist, died October 25, 1974, in Hot Springs, Arkansas. He served as State Geologist from 1927-1945 and in 1934 he was president of the Tennessee Academy of Science. From the beginning, Pond was active in Academy affairs, presenting a talk on the geology of Reelfoot Lake during 1927, his first year in Tennessee.

Born in Greenfield, Massachusetts, on June 23, 1885, Pond had an unusually long and varied career in Geology. More detailed summaries of his career will appear in The *Proceeding of The Geological Society of America* and in The *Bulletin of The American Association of Petroleum Geologists.*