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THE AMPHIBIANS AND REPTILES OF WESTERN
TENNESSEE

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The following report is based upon collections made in western Tennessee, west of the Tennessee River, by Professor A. G. Ruthven, in August, and by the writer, in July, in the summer of 1919. To make the report more complete, all the specimens from Tennessee, west of the Tennessee River, in the collection of the U. S. National Museum have been included, as well as the records of Rhoades* where they differ from those represented by these collections.

Ten salamanders, ten frogs and toads, four lizards, sixteen snakes, and ten turtles, or fifty forms in all, are represented. This is, of course, considerably less than the total number inhabiting the region, a good many of which could be predicted from our knowledge of general distribution. I have here included only definite records, a good many of which

* Rhoades, S. N., Contributions to the Zoology of Tennessee. *Proc. Acad. Nat. Sci., Philadelphia*, 1895, pp. 376-407.

are of forms not hitherto reported from this region. The value of these records is increased by the changes that are taking place in the fauna. There can be little question that the continued deforestation and denudation of the area is being accompanied by the widespread extermination of amphibians and reptiles. Furthermore, the additional material from this interesting section of the country will be useful in revisional and distributional studies.

No general description of the region can be given, as the writer spent his whole time (July 4 to 22, 1919) in the vicinity of Henry, in Henry County. This particular locality is about on the divide between the Mississippi and Tennessee drainage systems in the northeastern portion of this section of the state. It is mostly upland with numerous small permanent ponds or pools on clay soil, with some deciduous woods and much land under cultivation. "Bottom lands" are common, where slow streams meander along wooded flats, terminated usually abruptly on either side by the better drained upland.

The writer is pleased to acknowledge the kindness of Dr. Leonhard Stejneger in loaning the material in the collection of the United States National Museum, of Professor Alexander G. Ruthven for the privilege of reporting upon his collection and of making use of the facilities of the Museum of Zoology of the University of Michigan, and of Dr. Emmett R. Dunn, of Smith College, for identification of *Eurycea bislineata cirrigera* and other salamanders in the collection.

The common or English names that appear in the notes are those in use by the people in and near the town of Henry.

LIST OF SPECIES

Notophthalmus viridescens viridescens (Rafinesque).—Rhoades referred fourteen newts secured at Samburg to *meridionalis*. These have been recently examined by Dr. E. R. Dunn (Proc. Acad. Nat. Sci., Philadelphia, 1917, p. 27) and identified as *viridescens*. I have, therefore, followed Dunn in referring a specimen (U. S. N. M. 28393) from Maxey to this form.

Ambystoma microstomum Cope.—Two specimens from Maxey, collected by George D. Morgan (28389-90), are in the National Museum collection.

Ambystoma opacum (Gravenhorst).—Twenty-three examples of this species have been examined, only a single one of which was taken near Henry. The latter was found under a small, loose board in an oak-hickory woods near an open field.

Localities and specimens are as follows: Camden, Benton County, and Reelfoot Lake, Obion County, University of Michigan; Maxey and Big Sandy, U. S. National Museum. Rhoades mentions a specimen from Raleigh.

Ambystoma talpoideum (Holbrook).—In the National Museum are two specimens (28391-92) of this salamander from Maxey, collected by George D. Morgan.

Plethodon glutinosus (Green).—Common near Henry, where 28 specimens were taken under rotten logs or loose bark of fallen trees in the woods. In addition, 33 specimens have been examined from Camden, Reelfoot Lake, and Jackson, Madison County (University of Michigan), and Maxey and Big Sandy (U. S. N. M.).

Rhoades regards this the "most abundant and uniformly

distributed salamander in Tennessee," and records specimens from Samburg and Raleigh.

Eurycea bislineata cirrigera (Green).—One specimen, identified as this form by Dr. E. R. Dunn, was taken near Henry (University of Michigan, No. 53543). It was found in a soft rotted log in damp lowland woods along with a specimen of *Desmognathus fuscus fuscus*.

Eurycea gutto-lineata (Holbrook).—Nineteen specimens were taken near Henry in low woods under damp logs, and Professor Ruthven took six at Moscow, Fayette County.

Eurycea longicauda (Green).—A specimen in the National Museum (No. 45959) from Big Sandy is identified as this form by Dr. E. R. Dunn.

Pseudotriton ruber ruber (Sonnini).—One of the less common salamanders; found in the same situations as *Desmognathus fuscus fuscus*. Eight examples were taken at Henry and one at Como.

Desmognathus fuscus fuscus (Rafinesque).—This salamander was found to be abundant near Henry in woods at edges of springs, ponds, and swamps, under wet leaves or logs that rested partly in the water. It has apparently not hitherto been recorded from so far west. Fifty-four specimens of all sizes were secured.

Bufo fowleri Garman.—All of the toads examined from western Tennessee, fifteen in number, appear to belong to this species. They were found to be very common in the vicinity of Henry, and in view of the unsatisfactory state of our knowledge of the systematic status of the toads it is regretted that a larger series was not taken. They are called "toad-frogs" by the people near Henry.

Specimens and localities are as follows: Camden, Jackson, Henry, Como, Reelfoot Lake, and Somerville, Fayette County (University of Michigan), and Maxey and Memphis (U. S. National Museum).

Acris gryllus (Le Conte).—This form was found to be common near Henry along wet shores of ponds and marshes when not thickly wooded. Fifteen examples were taken. Ruthven took eleven specimens at Reelfoot Lake, Obion County. It is recorded by Rhoades from Samburg.

Pseudacris triseriata (Wied).—Identification provisional. Only a single specimen has been examined (U. S. National Museum, No. 28378, Maxey). The heel extended forward reaches the posterior border of the orbit.

Hyla cinerea (Schneider).—Two adults were taken by Professor Ruthven at Reelfoot Lake, Obion County. Rhoades records it from Samburg.

Hyla versicolor versicolor Le Conte.—This species was often heard calling, in the vicinity of Henry, and is undoubtedly common, although only four specimens were secured. Two in the National Museum represent Memphis and Maxey.

Rana catesbeiana Shaw.—The bullfrog is one of the commonest frogs in the vicinity of Henry. Twenty-four specimens were secured here. Ruthven took it at Moscow and Lane; two in the National Museum represent Maxey; and Rhoades records it from Samburg.

Rana clamitans Latreille.—Common near Henry in low, wooded situations, often under logs or near water. Twenty-one examples were secured, representing Como as well as Henry.

Rana palustris Le Conte.—Two isolated examples were found near Henry in woods near but not in water.

Rana sphenocephala (Cope).—A very common frog in low woods near water, or even in fields and at a considerable distance from water. Commonly escapes by long leaps into bushes or grass. Specimens and localities are as follows: Moscow, Reelfoot Lake, Lane, and Henry (University of Michigan) and Maxey (U. S. National Museum). Rhoades records it from Samburg and Raleigh.

Gastrophryne carolinensis (Holbrook).—Two adults were taken at Henry, one under a log in wet, open woods, and the other under a loose board near a very small pond in an open field.

Rhoades reports one adult from Raleigh.

Sceloporus undulatus (Latreille).—The black lizard was found to be very common near Henry on rail fences, trees, fallen logs, and stumps, in fields or openings in woods. In escaping a pursuer it was in no case seen to run on the ground. Twenty-seven specimens were taken. Professor Ruthven took three at Camden and one at Jackson. In the National Museum there is one specimen from Big Sandy, one from Maxey, and three from Memphis. Rhoades reports it from Samburg and Raleigh.

Cnemidophorus sexlineatus (Linné).—These lizards are called "sand scrapers" by the people near Henry. They are exceedingly common in sandy situations and are always found on the ground. They are very swift and escape by rushing into grass or brush. Over night some at least remain in holes dug in the sand, from which they may easily be taken early in the morning. The burrow is short and has two openings,

and when the lizard is inside one of these openings is partially filled with sand thrown out from within.

Twenty-eight specimens were taken near Henry and six at Somerville, Fayette County.

Strangely enough, Rhoades did not find this species in western Tennessee.

Leiolopisma laterale (Say).—The single specimen taken near Henry was found under a fence rail lying in an open field at the edge of a woods. Professor Ruthven took four specimens at Reelfoot Lake.

There is a single example in the National Museum from Maxey (No. 28410). Rhoades calls it "abundant," and records three adults from Raleigh.

Plestiodon fasciatus (Linné).—These lizards, locally known as "scorpions," were found commonly on trees and fences in wooded situations. They escape their pursuers by running around or up the tree, not by crossing the ground. An adult female with nine eggs was found, July 12, under the loose bark of a large fallen tree in the woods. The eggs appeared to be in no special cavity, but merely lay in the damp, rotted wood between the bark and the harder wood beneath. On July 15 two adult females and ten eggs (two eggs smaller and of different shape) were found in a hollow in a dead willow tree, about fifteen feet above the ground, buried in the loose, damp, rotted wood. One very small individual was found with the eggs, but escaped.

Twenty specimens were taken by Professor Ruthven and the writer from near Henry, near Como, Camden, Jackson, Reelfoot Lake, and Lane (Dyer County).

The following localities are represented by specimens in the National Museum: Maxey (28408-9), Clarksville (44932,

48200), Huntington (14113), Danville, Houston County (44770). Rhoades found it in the "western lowlands only," recording specifically Samburg and Raleigh.

Carphophis amoena (Say).—The single specimen examined (U. S. N. M., No. 44365, Danville, Houston County), a female, is typical in coloration. The scale rows are 13; upper labials, 5; lower labials, 6; post oculars, 1. There is only a single posterior temporal on each side. This specimen, as well as the one recorded by Rhoades from Raleigh, Shelby County, lacks the internasals. This is also true of a good many middle western specimens. It is not improbable that this character will prove of more geographic significance than hitherto supposed, and that a revision of the genus will assign these western Tennessee specimens to the western race, *C. vermis* (Kennicott). The ventrals are 128, the caudals 28, the length 253 mm., the tail 0.146 of the length.

Diadophis punctatus strictogenys Cope.—This name, given by Cope to a specimen with locality unknown, seems to belong to a race occupying the lower Mississippi Valley south from southern Illinois, the essential features of which are a low number of ventrals, 15 rows of dorsal scales, 7 upper labials, and more or less irregular or scattered black spots on the belly. In the first two characters it is identical with *punctatus* from the southeastern states, in the second it agrees with *edwardsii*, and in the third with *arnyi*. The ventral spots in *strictogenys* are not so neatly arranged in twos as they are in *arnyi*, nor are they in a single, well-defined row along the middle of the belly as in *punctatus*, but are irregularly arranged in the center, often partially fused into a single line.

The eastern ring-neck snakes may be provisionally defined as follows:

- A* Black spots on belly scattered or irregular; upper labials, 7 (only rarely 8).
- a* Ventrals more than 145; scale rows, 17-17, or 17-15 (occasionally only 15); belly spots scattered or in twos, generally clean-cut in appearance. *D. punctatus armyi* (Kennicott) (Western Illinois, Iowa, Missouri, northwestern Arkansas, west to the Great Plains and south into Texas.)
- a*₁ Ventrals less than 145; scale rows 15 throughout; belly spots showing tendency to fuse into a single row, or irregularly massed. *D. punctatus strictogenys* Cope (Southern Illinois through the lower part of the Mississippi Valley to the Gulf.)
- A*₂ Black spots on belly in a single median row or absent (very rarely irregular); upper labials usually 8.
- b* Sum of ventrals and caudals usually less than 191; belly with a series of large half-circular black spots along the median line, neck ring usually partially or wholly interrupted on the mid-dorsal line. *D. punctatus punctatus* (Linné) (Eastern Alabama north to southern Virginia and south throughout Florida.)
- b*₁ Sum of ventrals and caudals usually more than 191; belly usually immaculate, but sometimes with a median series of small black spots, more or less imperfectly developed; neck ring only rarely interrupted on the mid-dorsal line. *D. punctatus edwardsii* (Merrem) (Wisconsin to the southern Appalachians and north into Canada.)

In the western Tennessee specimens the scale rows are only 15, the upper as well as the lower labials are seven, the neck ring is one-half to one scale in width, and the bellies are heavily spotted. The ventrals and caudals are as follows:

Locality	Ventrals	Caudals	Length	Tail divided by length	Sex
Camden	148	37	332	0.160	Female
Henry	143	44	276	0.178	Male

Heterodon contortrix (Linné).—The spreading adder is well known and rather common in fields and about dwellings. It is much feared as poisonous and is always killed. Of the numerous examples seen near Henry only two were captured. Rhoades records three from Samburg.

The characters of the specimens taken at Henry are:

Scale rows	Ventrals	Caudals	Labials	Oculars	Length	Tail divided by length	Sex
25-19	134	47	8 — 10-11	10 — 11	625	0.170	Male
25-19	144	44	8 — 11	11	745	0.161	Female

Coluber constrictor constrictor (Linné).—The black snake, or black racer, was seen frequently in fields and at the edges of woods. Three specimens were taken at Henry. These are all very dark in coloration, the scale rows on each are 17-15 and the oculars are 2-2. Rhoades records specimens from Samburg.

Ventrals	Caudals	Labials	Length	Tail divided by length	Sex
174	87	8-7 — 8-8	1170	0.248	Male
177		7 — 8			Adult female
181	98	7 — 8	1349	0.245	Male

Elaphe obsoleta obsoleta (Say).—This is a common and well-known snake, locally called "chicken snake." Near Henry a young adult was taken in an oak-hickory woods as it was going under a fallen log, and a cast skin was found in a school-house. The latter may have been carried in. This Henry specimen shows the dorsal spots clearly, but larger examples from Reelfoot Lake and Arlington (U. S. National Museum) more nearly approach the typical coloration. Rhoades reports it from Samburg and refers to it as the most abundant snake throughout the state.

Locality	Scale rows	Ventrals	Caudals	Labials	Length	Tail divided by length	Spots	Sex
Reelfoot Lake....	25-27-19	235	75	8 — 12	1280 mm.	.157	31	Female
Henry	23-25-17	244	81	8 — 11	1010 mm.	.173	31	Female
Arlington	25-19	231	85	8 — 11	1390 mm.	.180	29	Male

Lampropeltis getulus holbrooki (Stejneger).—The specimen collected by Rhoades at Samburg (Academy of Natural Sciences, No. 4451) has been examined by the writer and referred to this form. It has, however, a distinct leaning toward the next, *L. getulus niger*. The characters are: scale rows, 19-21-19-17; ventrals, 210; caudals, 54; upper labials, 7; lower labials, 9; cross bands, 70; male.

Lampropeltis getulus niger (Yarrow).—The king snake is known to most of the farmers, but is less often seen than *Coluber constrictor* and *Elaphe obsoleta*. One moderate-sized adult was found at the side of a road near Henry at dusk. This is close to, if not within, the region of intergradation between this form and the last, but the specimen found was more like *niger* than like *holbrooki*. The yellow spots were very small, although present for the most part midway between the cross bands. It was kept alive for two days, and then escaped.

Natrix cyclopion (Dumeril and Bibron).—Rhoades records four specimens from Samburg.

Natrix erythrogaster (Forster).—Two forms of harmless water snakes are recognized by the people near Henry. The one with the pattern of spots is called the "water moccasin," and the one that is very dark above with no dorsal markings and with pinkish belly is called the "copper belly." It seemed to the writer that these two forms were never found together, but more observation is needed on this point as well as on a number of others before the status of *erythrogaster* can be satisfactorily settled. It is surely not time to synonymize the name with *sipedon*. It is at least suggestive that all the Henry specimens separate into two clear-cut groups on the basis of belly pattern and ventrals, those with copper bellies having from 149 to 156 ventrals and those having spots below like *sipedon* possessing 136 to 144 ventrals. This was noted by Clark,* and has recently been observed by the writer in the course of examination of large numbers of these types of water snakes. It appears that young examples of *erythrogaster* show the dorsal pattern of *sipedon* but not the ventral. It is particularly desirable that numerous entire broods of both these forms from the same region be obtained for examination.

The specimens described below are all from Henry, Tennessee, and are deposited in the University of Michigan Museum. The oculars and temporals are 1-3, the lower labials 10, in every specimen.

Scale rows	Ventrals	Caudals	Upper labials	Total length, millimeters	Tail divided by length	Spots	Sex
21-23-17	149	75	8	428	.245	36	Female
23-25-19	149	70	8	1004	.220	None	Female
21-23-17	156	67	9	1203	.195	None	Female
22-23-17	152	..	8	860 (incomplete)		None	Male
23-17	150	..	8	1030		None	Female

* Clark, H. L. *Amer. Nat.*, vol. 37, 1903, pp. 1-23.

Natrix rhombifera (Hallowell).—A very large skin in the National Museum from Maxey, Dyer County, is identified as this species, probably correctly. The scale rows reach a maximum of 28; there are no suboculars; the pattern is obscure, but seems to be like that of *N. rhombifera*. A more certain record is that furnished by a small specimen collected by Ruthven at Reelfoot Lake.

Locality	Scale rows	Ventrals	Labials	Oculars	Temporals	Spots	Sex
Reelfoot Lake ..	27-21	146	9-10 ———— 12-13	1-4, 2-3	1+3	30	Male
Maxey	27-28-21	142	8 — 10	1, 3	—		

Natrix sipedon sipedon (Linné).—This snake was seen more often than any other. It was found along all the water courses, frequently lying in the bushes or on driftwood ready to drop off into the water at the first alarm, and was even common in the village of Henry by some of the numerous small ponds. All the specimens listed below are in the University of Michigan Museum and are from Henry, Tennessee. They show no evident approach to *N. fasciata*, even though in two specimens (53524, 53530) the dorsal saddles are complete throughout the body length, for they all show the half-circular belly spots, diagnostic of *sipedon*, and lack the postocular light line distinctive of *fasciata*.

The species recorded by Rhoades from Samburg was probably this form.

All of the specimens have 8 upper labials and 10 lower labials.

Scale rows	Ventrals	Caudals	Oculars	Temporals	Length in mm.	Tail divided by length	Spots	Sex
23-19	139	80	2-3	1-3	368	.272	22	Female
21-23-17	136	82	1-3	1-3	676	.280	31	Male
23-19	138	74	1-3	1-2	509	.250	25	Male
23-17	140	66	1-3	1-2	688	.240	23	Female
23-24-18	143	61	2-3	1-3	924	.215	27	Female
23-25-19	137	63	1-3	1-3	731	.235	27	Female
21-23-17	144	72	1-3	1-2	441	.250	23	Male

Virginia valeriae elegans (Kennicott).—A small specimen from Maxey, collected by G. D. Morgan, September 20, 1900, is typical of this form in most respects, but the first seven anterior caudals are entire and the last two lower labials on each side are united. Nearly all of the dorsal scales are keeled, but this is by no means atypical, as the series in the collection of the United States National Museum shows. The four longitudinal rows of black dots on the back show plainly, and a light median dorsal stripe is just discernible.

Its scalation is as follows: scale rows, 17 throughout; ventrals, 120; caudals, 45; upper labials, 6; lower labials, 5; loreal and prefrontal entering eye; temporals, 1+2; sex, male; total length, 101.5 mm.; tail length, 21 mm. (U. S. National Museum, No. 28412).

Thannophis sauritus sauritus (Linné).—Two specimens, both males, were obtained, representing Austin Lake, Obion County, and the township of Henry. Ribbon snakes from critical regions are not readily distinguishable, but the specimens secured may, on the basis of their seven supralabials and

high ventral and caudal counts, most readily be referred to this form. The Henry specimen was found under a piece of loose bark in a very small opening in a wet, grassy marsh or meadow. It escaped into the grass, but was taken on the next day beside a log within three or four feet of the same place.

Locality	Ventrals	Caudals	Labials	Length	Tail divided by length
Austin Lake..	175	116	7-8 — 10	280	.285
Henry	169	129	7 — 10	645	.353

Tantilla coronata Baird and Girard.—The scutellation of the two specimens found, one at Camden and one at Henry, seems to be typical: scale rows, 15; upper labials, 7; lower labials, 6; preoculars, 1; postoculars, 2. The coloration differs a little. The specimen from Henry has the light collar involving the tips of the parietals and half of the first dorsal scales; this is followed by a black half collar two scales wide and preceded by a mixture of black and brown becoming lighter on the snout. The Camden specimen has a narrower light collar, succeeded by a black band four scales wide, and the top of the head is entirely black.

The specimen from Henry was found under the boards of a small fallen shed in a small clearing on a wooded slope.

The characteristics not given above are as follows:

Locality	Ventrals	Caudals	Length	Tail divided by length	Sex
Camden	137	46	233	0.199	Male
Henry	143	44	324	0.185	Female

Agkistrodon mokasen Beauvois.—The highland moccasin, as it is called, seems to be well known to the farmers, but no specimens were seen either by Professor Ruthven or the writer. Rhoades, however, records two specimens from Samburg and one from Raleigh.

Agkistrodon piscivorus (Lacépède).—The cotton-mouth moccasin is common in the swamp lands everywhere, whether wooded or not. Five specimens were taken near Henry and many more were seen. There is a specimen in the National Museum from Arlington, and Rhoades records one from Reel-foot Lake.

Locality	Scale rows	Ventrals	Caudals	Labials	Length	Sex
Henry...	25-24-25-21	136	41	7-8 — 11	687	Female
" ...	23-25-21	136	44	7 — 10	720	Female
" ...	25-21	137	48	8 — 11	765	Male
" ...	25-21	136	46	7-8 — 10	953	Male
" ...	25-21	132	45	8-7 — 11	788	Male
Arlington	25-23-25-21	135	43	8-7 — 11	361	Female

Kinosternon odoratum (Latreille).—Evidently common. Nine specimens are at hand (University of Michigan collection), representing Henry and Reelfoot Lake.

Kinosternon subrubrum subrubrum (Lacépède).—A single small specimen identified as this form by Dr. Stejneger was taken near Henry in a small pool of water in a sunny road through moist woods. The carapace is 40 mm. in length, and the plastron is 37 mm. long.

Rhoades records one example of *Kinosternon pennsylvanicum* from Samburg.

Chelydra serpentina (Linné).—A single adult was seined from a small pond at Henry, but was accidentally destroyed after it reached Ann Arbor. Rhoades took six specimens at Samburg.

Terrapene carolina carolina (Linné).—An adult specimen each from Henry and Camden (University of Michigan, 53513, 53266) and from Clarksville and Danville (U. S. National Museum, 45304, 45307).

Graptemys pseudogeographica pseudogeographica (Gray).—Five specimens were secured by Professor Ruthven at Reelfoot Lake.

Chrysemys marginata dorsalis (Agassiz).—A single specimen was taken by Professor Ruthven at Reelfoot Lake.

Pseudemys concinna (Le Conte).—Recorded by Rhoades from Raleigh and Samburg.

Pseudemys elegans (Wied).—This turtle was very common in the pools and ponds near Henry, and it was also seen in the streams. Twenty-five specimens were secured, representing Henry and Reelfoot Lake (University of Michigan collection).

Amyda mutica (Le Sueur).—A single juvenile specimen of this species was taken by Professor Ruthven at Trotter's Landing, Benton County.

Amyda spinifera (Le Sueur).—One young example was secured by Professor Ruthven at Reelfoot Lake.

Rhoades refers to this species as "very abundant in west Tennessee," and records eleven specimens from Samburg.



