HERPETOLOGICAL REPORT OF MORGAN COUNTY, INDIANA[1]

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The purpose of this brief paper is two-fold: (1) to record the summation of species taken in Morgan County, Indiana during three years collecting, (2) to compare the quantitative results with the number, both actual and tentative, of those species occurring in the state. The assumed value of the dichotomy will be readily grasped in the former, in the latter probably with hesitation. The merit of the last becomes more perspicuous when the rhythm and compensations of distribution are felt, even though the scope of these notes is limited and the data are almost negligible for the instigation of such. Even the most rigid of sciences are after all only ἀ-πειρος.

Morgan County as a choice was not altogether arbitrary; it is a county in which the topography warrants an average vertebrate fauna though due to its lack of large water courses, extensive prairies, and swamps it naturally excludes certain forms. A county bordering the Ohio River, for instance, would offer environment for several species not inhabiting Morgan County. This county is composed of stretches of level fields moderately cut through by small streams while large parts are of a hilly nature, viz., steep little ravines and shale bottomed brooklets. The entire region is interspersed with tracts of deciduous forest, especially the uneven parts; there is an abundance of old logs and similar places of retreat for salamanders, snakes, etc. The fact that Morgan County is comparatively near to the central portion of the state and yet enough south to furnish groups seldom found much farther north makes it *a fortiori* more desirable. These points would, then, logically guarantee an average representative fauna, that is, simply a normal county taxonomically speaking. It is only this type of county that should be checked against the whole state, not one characterized through position or physiographical features by a paucity of species or its antithesis. I feel certain, however, that protensive collecting will reveal forms not here listed.

The list immediately following is a catalogue of the species actually taken within the limits of Morgan County, Indiana. The second list explains itself.

Necturus maculosus (Rafinesque). Taken from White River. Several of this species were caught on hook and line by fishermen who with one accord proclaimed the squirming animal to be very poisonous.

Triturus viridescens viridescens (Rafinesque). Two in the second larval stage captured beneath a pile of logs at the mouth of a small ravine. Great contrast in size; one being 83 mm., the other 42 mm.

Ambystoma opacum (Gravenhorst). A full sized individual from under an old railroad tie on the summit of a "Knob." The ground was fairly dry and the salamander was just emerging from a burrow. Two more taken in the near vicinity and under similar circumstances. In Indiana I have always found this species in relatively dry places but in the south it apparently prefers very moist situations.

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[1]Exclusive of turtles.

Ambystoma maculatum (Shaw). One specimen taken from the interior of a rotten log. The time of year was early and due to the small size of the creature I presume it had passed the winter in this environment. I have found it under the same conditions before. It is undoubtedly common about water in this county at breeding season.

Plethodon cinereus (Green). With the possible exception of *P. glutinosus* this form is the most abundant to be met with in the whole region. It is best found under loose shale and debris on the north side of steep, sylvan ravines. Under and in old logs also; never discovered very close to water. It is possible that both this species and the next are perennially terrestrial.

Plethodon dorsalis (Cope). It is safe to assume that for about every one hundred and fifty of the above form there is usually a corresponding individual of this species. Seven found altogether; none discovered without the zigzag stripe on the dorsum. Smaller. One was taken beneath a flat piece of shale about one foot from a little brooklet. This is the closest I have ever seen the species to water.

Plethodon glutinosus (Green). Notoriously common. Taken from beneath almost every moist log or stump. Agile but not extremely elusive. I have examined an albino individual of this species from the territory and find it to be normal in every respect except dermal pigmentation.

Eurycea bislineata bislineata (Green). The chief habitat of this urodele is beneath flat shale slabs in or very near the water of brooklets flowing into Sycamore Creek. Very numerous. I have noticed that it appears consistently darker in the early fall, strikingly more so than in the spring. This is true of *E. longicauda* also. This may find partial explication in the fact that the closer contiguity of the chromatophores is concomitant with the change in metabolism in preparation for hibernation.

Eurycea lucifuga (Rafinesque). Though not exactly common this species is well represented in the county and it is more abundant locally. Three taken from a rocky, cavernous orifice in a shallow depression of the ground. A typical cave in miniature. It is extremely difficult to catch, dashing from crevice to ledge with bewildering rapidity. One was taken from under a plank in a pump-house with a floor of damp gravel.

Eurycea longicauda (Green). This, unlike most beautiful things, is common. It is found under conditions similar to *E. b. bislineata* with the marked exception that I have never seen it in the water but under rocks on the moist sides of the brook. It is not unusual to find several beneath the same piece of shale.

Bufo fowleri (Garman). Everywhere common. Found in fields and sparse woods, sometimes occurring under the heavy, loose bark of fallen trees. Rapid and intense metachrosis manifested in this form.

Bufo americanus (Holbrook). This toad has been found only occasionally in the county. It prefers moist situations and only rarely is it to be discovered in the dry, open fields. It has been my experience to find *Bufo americanus* only about the larger water courses of the state, and in no place is it as abundant as the preceeding species.

Acris gryllus (LeConte). Very numerous, filling the air at evening with their staccatic trills. Found about old ponds and other appreciable bodies of water. Especially abundant in wet, luxuriant patches of grass.

Pseudacris triseriata (Wied). Locally common. Many seen in a shallow, woodland pool in which half submerged logs and the muddy bottom offered places of concealment. At night, and many times through the day, its rhythmic

cadence is heard. The note is a steady rise and fall—a musical paean to the great god Water.

Hyla crucifer (Wied). Recognized in early March by its shrill, sweet peep. Found in moist woods during the day, secreting itself beneath loose bark. At dusk it frequents the margins of sedged pools and streams. Wide-spread.

Hyla versicolor versicolor (LeConte). The habits of this species resemble those of the spring peeper. It is generally, though, found higher up on knots of tree trunks, and sitting at the mouth of small openings in rotten beech. Always more arboreal.

Rana pipiens (Schreber). Everywhere, especially at breeding season in and about perennial pools of water and streams in which the current is not too turgid.

Rana clamitans (Latreille). Generally seen in small lakes and ponds. Aquatic and retiring. I have taken a pair of *Rana in coitu*, the male being, *pipiens* and the female, *clamitans*.

Rana catesbeiana (Shaw). Heard and taken along the border of sluggish streams and from the dismal recesses of stagnant ponds. Common.

Rana sylvatica (LeConte). One taken from moist hillside in woods. Again, five found about a small, sequestered brook flowing between steep, wooded hills. Merits the name of wood frog.

Plestiodon fasciatus (Linné). Very abundant, nearly always found underneath loose, coarse bark of large fallen trees and logs in the neighborhood of tiny brooks. Numerous adults taken from about timber on ground and several times rather high up in trees.

Sceloporus undulatus (Latreille). More common toward the southeastern part of the county. Very active, often running from log or rail fences to the stem of a tree where it rapidly ascends a spiral course in a series of erratic dashes. This form has a predilection for comparatively dry wooded areas.

Carphophis amoena (Say). Moderately common but always secretive. This diminutive snake is found beneath rocks, dead leaves, and logs. Old chips seem to suit its fancy for concealment admirably.

Diadophis punctatus edwardsii (Merrem). Very plentiful, hiding under loose bark of rotten logs and stumps. It favors damp ground and is often discovered upon turning over half buried slabs of rock. This is the only form of ring-neck snake I have found in Indiana. In lieu of my collecting in the southeastern states and the intensive search for constant variation among the Indiana *Diadophis* I must say, despite my very limited knowledge, that there are a greater number of varieties in the literature than in our woods and fields.

Heterodon contortrix (Linné). Bids fair to become common; two adults and one young taken. One of the adults was the melanistic phase. This is a serpent that is found at the most unexpected times and places. Seems to enjoy sandy country.

Opheodrys aestivus (Linné). One taken from a small tree among the green foliage; another from some blackberry bushes. Unbelievably difficult to discern when in this habitat. Reliable reports of other greensnakes come to me but it is impossible to tell whether they are this species of *Liopeltis vernalis*. The occurrence of the latter within the county is more than a probability.

Coluber constrictor constrictor (Linné). Wide-spread and very common. It is rather hard to determine whether this black-snake or the pilot is more common in this region. This nervous creature is an inhabitant of the woods and hillsides, its roaming propensities frequently proving disasterous since many are run

over on the roads. Always to be looked for near some rocky outcropping in the heart of a brambly thicket. Very quick.

Elaphe obsoleta obsoleta (Say). As numerous as the preceding. Very arboreal, several being caught high up in the branches of large trees. A much gentler snake than the blue-racer and never displaying that nervous tendency so characteristic of all Colubers. A female deposited eleven eggs while in captivity, July 30, 1929.

Natrix sipedon sipedon (Linné). Found everywhere along water courses and ponds. Secretive to a certain extent in the daytime being found under flat stones. A very vicious reptile, considerably more so than any other Indiana snake. A gravid female contained twenty-six young.

Natrix septemvittata (Say). Locally common; not in such numbers as the preceding form. This and the above snake often observed together beneath the same rock. One of the mildest and prettiest of the water snakes.

Storeria dekayi (Holbrook). One taken about four o'clock in the afternoon crossing a path on the summit of a ridge. Probably very abundant and should be looked for at night.

Thamnophis sirtalis sirtalis (Linné). Wide-spread; taken from low bushes, under logs, and in the open. A shy species and not so numerous as would be expected.

Agkistrodon mokasen (Beauvois). One found dead, possibly beaten to death by some farmer. Several reports of the copper-head have been given to me by the "natives" of Morgan County but as yet the sole authentic account rests upon the dead specimen. Probably uncommon.

Crotalus horridus (Linné). Two taken; one of them very large. Apparently limited to the southeastern part of the region. Numerous reports by farmers with but few substantiated by the "rattles." Since rattlesnakes even in districts where they are known to be common are seldom seen, it seems logical to assume that the paucity of this form in the county is perhaps only ostensible.

There are several species, which, though not actually taken by myself from Morgan County, undoubtedly occur there since their abundance elsewhere in regions of immediate propinquity evinces their presence here beyond a doubt. They are: *Ambystoma tigrinum* (Green), *Ambystoma microstomum* (Cope), *Siren lacertina* (Linné), *Liopeltis vernalis* (Harland), *Natrix kirtlandii* (Kennicott), *Storeria occipito-maculata* (Storer), and *Thamnophis sauritus* (Linné).

Following is a tabulation of all species, both those occurring and those which might possibly be expected to occur in the state of Indiana.

a—Indicates species not yet found in Morgan County but occurring elsewhere in the state.

A—Indicates species not yet taken from Indiana but whose ranges make it plausible that occurrence would not be wholly improbably.

T—Indicates species taken from Morgan County, Indiana.

t—Indicates species certain to be found in the county.

1 T *Necturus maculosus* (Rafinesque).
2 a *Amphiuma means* (Garden).
3 a *Cryptobranchus alleganiensis* (Daudin).
4 T *Triturus viridescens viridescens* (Rafinesque).
5 t *Ambystoma tigrinum* (Green).

6 T *Ambystoma opacum* (Gravenhorst).
7 t *Ambystoma microstomum* (Cope).
8 T *Ambystoma maculatum* (Shaw).
9 a *Ambystoma jeffersonianum* (Green).
10 A *Ambystoma talpoideum* (Hoolbrok).
11 a *Hemidactylium scutatum* (Schlegel).
12 T *Plethodon cinereus* (Green).
13 T *Plethodon dorsalis* (Cope).
14 T *Plethodon glutinosus* (Green).
15 A *Gyrinophilus porphyriticus* (Green).
16 A *Pseudotriton ruber ruber* (Sonnini).
17 T *Eurycea bislineata bislineata* (Green).
18 T *Eurycea lucifuga* (Rafinesque).
19 T *Eurycea longicauda* (Green).
20 A *Eurycea gutto-lineata* (Holbrook).
21 a *Desmognathus fuscus fuscus* (Rafinesque).
22 t *Siren lacertina* (Linné).
23 T *Bufo americanus* (Holbrook).
24 T *Bufo fowleri* (Garman).
25 T *Acris gryllus* (LeConte).
26 T *Pseudacris triseriata* (Wied).
27 a *Pseudacris feriarum* (Baird).
28 A *Hyla cinerea cinerea* (Schneider).
29 T *Hyla versicolor versicolor* (LeConte).
30 a *Hyla squirella* (Latreille).
31 T *Hyla crucifer* (Wied).
32 A *Hyla phaeocrypta* (Cope).
33 T *Rana pipiens* (Schreber).
34 a *Rana palustris* (LeConte).
35 a *Rana areolata* (Baird and Girard)
36 T *Rana catesbeiana* (Shaw).
37 T *Rana clamitans* (Latreille).
38 A *Tana sphenocephala* (Cope).
39 T *Rana sylvatica* (LeConte).
40 A *Rana cantabrigensis* (Baird).
41 A *Rana septentrionalis* (Baird).
42 A *Gastrophryne carolinensis* (Holbrook).
43 T *Sceloporus undulatus* (Latreille).
44 a *Ophisaurus ventralis* (Linné).
45 a *Cnemidophorus sexlineata* (Linné).
46 a *Leiolopisma laterale* (Say).
47 T *Plestiodon facsiatus* (Linné).
47 T *Carphophis amoena* (Say).
49 a *Farancia abacura* (Holbrook).
50 T *Diadophis punctatus edwardsii* (Merrem).
51 A *Diadophis punctatus stictogenys* (Cope).
52 A *Diadophis punctatus arnyi* (Kennicott).
53 T *Heterodon contortrix* (Linné).
54 a *Heterodon simus* (Linné).
55 t *Liopeltis vernalis* (Harlan).
56 T *Opheodrys aestivus* (Linné).

57 T *Coluber constrictor constrictor* (Linné).
58 a *Coluber constrictor flaviventris* (Say).
59 T *Elaphe obsoleta obsoleta* (Say).
60 A *Elaphe guttata* (Linné).
61 a *Elaphe vulpinus* (Baird and Girard).
62 A *Pituophis sayi* (Schlegel).
63 a *Lampropeltis triangulum triangulum* (Lacépéde).
64 a *Lampropeltis triangulum syspila* (Cope).
65 a *Lampropeltis calligaster* (Harlan).
66 A *Lampropeltis getulus holbrooki* (Stejneger).
67 a *Lampropeltis getulus niger* (Yarrow).
68 T *Natrix sipedon spiedon* (Linné).
69 a *Natrix sipedon fasciata* (Linné).
70 a *Natrix rhombifera* (Hallowell).
71 T *Natrix septemvittata* (Say).
72 A *Natrix grahamii* (Baird and Girard).
73 A *Natrix cyclopion* (Dumeril and Bibron).
74 t *Natrix kirtlandii* (Kennicott).
75 T *Storeria dekayi* (Holbrook).
76 t *Storeria occipito-maculata* (Storer).
77 a *Virginia elegans* (Kennicott).
78 A *Virginia valeriae* (Baird and Girard).
79 A *Potamophis striatulus* (Linné).
80 A *Tropidoclonion lineatum* (Hallowell)
81 a *Thamnophis butleri* (Cope).
82 a *Thamnophis proximus* (Say).
83 a *Thamnophis radix* (Baird and Girard).
84 T *Thamnophis sirtalis sirtalis* (Linné).
85 t *Thamnophis sauritus* (Linné).
86 a *Micrurus fulvius* (Linné).
87 T *Agkistrodon mokasen* (Beauvois).
88 a *Agkistrodon piscivorus* (Lacépéde).
89 a *Sistrurus catenatus catenatus* (Rafinesque).
90 T *Crotalus horridus* (Linné).

The subsequent table gives two percentages: (1) the ratio in percent of actual species known from Morgan County to the actual species known from Indiana, (2) the ratio in percent of the tentative species plus those actually taken from the county to the tentative species plus those actually taken from the state. Adhering to this plan the two average ratios of W. S. Blatchley (Vigo Co., Ind.), and S. H. Springer (Marion Co., Ind.) are given to enable the comparison with those of the present paper.

	Caudata	Salientia	Lacertilia	Ophidia	Av. Pi.	Av. Sp.	Av. Bl.
1.	55.5%	71.4%	40%	36.36%	50.81%	44.9%	57.9%
2.	59.09%	50%	40%	37.2%	46.57%	38.2%	47.1%

This comparison of percentages proves, of course, nothing; however we may surmise three conclusions.

(1) In the majority of cases, the percent of species of a county (or an area similar to a county) to that of a territory (comparable to a state) is approximately 50 percent. A fair average when the contrast in size is realized.

(2) We see that the forms, both of a large tract and a small, fall into three groups: (a) permanent fauna (b) variable fauna (c) rare exotic fauna.

(3) The fact that the ratio of the small, actual to actual and of the larger, actual to actual is an approximate constant to the ratio of the small, tentative to tentative and of the larger, tentative to tentative. A prognostication that is not without significance.

Generally speaking I would like to reiterate that the fauna of any definite area is constantly undergoing modification and change. The rigid tabulation of one period will undoubtedly fail of congruence to that of another. Groups and varieties are ceaselessly pushing out, lengthening the Highways of Dispersal here, severing them completely in another. The "becoming" of things is as surely to be met with in these herpetological microcosms as in the rush of the planets. Faunal aggregations are dynamic not static.

It should be remarked that the assemblage of species possible to Indiana is wholly arbitrary. I have rejected some such as G. S. Myers', *Lampropeltis elapsoides elapsoides* or W. S. Blatchleys', *Abastor erythrogrammus*, as an undue warping of range; later they may be legitimate. I am of the opinion that if faunal zones were always employed instead of the highly artificial boundaries of states, the distribution problem would be upon a sounder basis.

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