Batrachia. By Curtis Atkinson.

Siren lacertina Linnaeus. A single specimen of this species was taken in the seine in the channel. Mr. Dolan secured another late in September, and afterwards, through his students, secured a nest of eleven, which were uncovered while cleaning a lot near Syracuse. These had evidently gone into winter quarters. Five of them are still alive. Turkey Lake is the most northern locality so far recorded for the siren.

Necturus maculatus Rafinesque. Three specimens of this species were secured. It is said to be abundant, but no other specimens were noted. On June 28, a number of eggs were found fastened to the lower surface of a board, which was well imbedded in the mud of the bank of Turkey Creek. The young were already quite active in the loose, flabby bags forming their covering.

Amblystoma jeffersonianum Green? A single specimen under a log near the lake.

Bufo lentiginosus Shaw. The ubiquitous toad was present, but not in great numbers at Syracuse, Turkey and Tippecanoe lakes.

Acris gryllus crepitans Baird. Abundant along the shallow margins of the lake among rushes and lillypads. Detailed localities where it was taken are outlet of String Lakes, Turkey Lake, Syracuse Lake, Turkey Creek, Webster and Tippecanoe Lakes and Tippecanoe River.

Rana virescens Kalm. Very abundant and variable. I am not at all certain that the varieties described by Cope and Hay are to be found among our material, but it seems quite certain that there is no correlation in the variations of different parts of the body. If varieties are to be distinguished it must be by separating them on single characters.

I have made measurements of a number of characters to determine whether the 120 specimens collected could be grouped according to any of these.

The relation of the tibia in the length of the body gave the length of the tibia .55 that of the body as the most common relation between the parts.

From this there is a gradual reduction to a length of .49 on the one hand and an increase to .70 on the other. But .20 of the specimens had the tibia with the most common length. This character is then perfectly useless in separating varieties in my specimens.

The same may be said of the length of the head in the length of the body, .33 is the relation occurring oftenest and from this there is a variation to .20 on one hand and .27 on the other; .20 of all the specimens have the length of the head .33 of the length of the body.

The relation of the fifth toe to the length of the third toe gave a very jagged curve with the length of the fifth toe .95 of the length of the third as the condition occurring in .20 of the specimens. From this a very irregular curve extends to .89 on one side and to 1.00 on the other.

The relation of the diameter of the tympanum to the diameter of the eye gave the most irregular curve. Thirty-five per cent. of all the specimens had a tympanum with a diameter equal to .60 of that of the eye. From this we have a saw-toothed curve to .48 on one side and .70 on the other. A comparatively large per cent.—15 per cent.—have a relation of .50. Attempts to get system out of this curve by breaking it up into age curves did not succeed entirely. But these separate curves for the different ages show that in the young the tympanum is comparatively small, and that the peak noted at the .50 mark is due to the young included in the general curve.

The whole study emphasized the fact that there is little or no coördination in the variation in this frog. No two characters, in fact, seem to vary together and all the specimens may be referred to but one variety.

I have in the following grouping, in the shape of the conventional key, separated the specimens according to their color patterns. All but one or two of the combination of patterns contains individuals which have the vomerine patches of teeth forming a straight line, and others with these patches inclined to each other at a more or less distinct angle. They clearly show that there is no coördination in the different parts of the color pattern. Each region varies apparently independently of the others.

KEY TO THE COLOR PATTERNS.

a. A spot on the nose.

b. Two complete series of spots on the back.

c. Two cross bars on the femur.

d. Tibia with a mixture of spots and bars. 5 specimens.

bb. Two complete series of spots on the back, with a third broken series between.

e. Two cross bars on the femur.

f. Tibia, with a mixture of spots and bars. 16 specimens.

ff. Tibia, with a row of spots on the anterior and another on the posterior edge, upper surface unspotted. 1 specimen.

ee. Three cross bars on the femur.

g. Tibia, with a mixture of spots and bars.

h. Spots on back, many and small. 21 specimens.

hh. Spots on back, few and large. 13 specimens.

gg. Tibia, with a row of spots on the anterior and another on the posterior edge, upper surface unspotted. 9 specimens.

eee. Four or five cross bars on femur.

i. Tibia, with a mixture of spots and bars. 16 specimens.

ii. Tibia, with a row of spots on the anterior and another on the posterior edge, upper surface unspotted. 2 specimens.

aa. No spot on the nose.

j. Two series of spots on the back.

k. Two cross bars on femur. Tibia, with a mixture of spots and bars. 4 specimens.

kk. Three cross bars on the femur. Tibia, with a mixture of spots and bars. 4 specimens.

kkk. Irregular number of cross bars on femur, always more than three.

l. Tibia, with a mixture of spots and bars. 2 specimens.

ll. Tibia, with a row of spots on the anterior and posterior edge, upper surface unspotted. 2 specimens.

jj. Two complete series of spots on the back, with a third broken series between them.

m. Two cross bars on the femur. Tibia, with a mixture of spots and bars. 4 specimens.

mm. Three cross bars on the femur.

n. Tibia, with a mixture of spots and bars. 11 specimens.

nn. Tibia, with a row of spots on the anterior and another on the posterior edge, upper surface unspotted. 4 specimens.

mmm. Four or five cross bars on the femur.

o. Tibia, with a mixture of spots and bars. 1 specimen.

oo. Tibia, with a row of spots on the anterior and another on the posterior edge, upper surface unspotted. 4 specimens.

String Lakes, Upper and Lower Turkey Creeks, Turkey, Webster and Tippecanoe Lakes.

Rana palustris LeConte. One at the String Lakes, one at Turkey Lake, five at Tippecanoe Lake.

Rana sylvatica LeConte. A single specimen at Turkey Lake.

Rana clamata Daudin. Abundant at Upper and Lower Turkey Creek, Turkey and Tippecanoe Lakes.

Rana catesbiana Shaw. Abundant among lily pads, especially in parts of the lake not frequently visited. Turkey and Tippecanoe Lakes.

Snakes of Turkey Lake. By G. Reddick.

The number of specimens of snakes taken amount to about 225. They belong to five genera and eight species.

Bascanion constrictor Linn. is common around Turkey Lake and is the largest of the snakes found here. This snake is of course no part of the lake fauna. This snake was also taken at Lake Tippecanoe.

Eutainia sirtalis Linn. is very abundant along the margin of the lake, feeding on frogs and fish. One specimen was secured with a cat-fish spine sticking through the body wall of the snake.

Young taken from this snake July 17 averaged a slight fraction over seven inches in length and were almost grown, only a very small amount of the yolk being left. These young as soon as they were liberated would try to crawl away, and upon provocation and some without provocation would open their little mouths and flatten their heads and strike as viciously as old snakes.

As high as seventy-two young were taken from one snake, and often from thirty to forty. The average appearing to be between thirty and forty. This snake was also secured from Tippecanoe Lake.

Eutainia saurita Linn. is not nearly so abundant nor is it nearly so prolific. Eggs were taken from only three or four specimens, six being the highest number taken from any one. Specimens of this snake were also taken from the margins of Lake Tippecanoe.

Eutainia butlerii Cope. Only one specimen of this was taken. It was fourteen and one-half inches long. This snake is short and chubby and its movement is very characteristic of it. It does not have the gliding movement of *E. saurita* nor the swift but yet very active movement of *N. sipedon*, but seems rather to exert a large amount of force to do little crawling. The movement is so characteristic that I believe any one, having once seen the peculiar way in which it tries to hurry itself away, would ever after be able to recognize it at a distance. No specimen was taken from Lake Tippecanoe.