

five specimens of this Tern at Miller's, Indiana, in August, 1898. None were taken.

Mr. F. M. Woodruff, of Chicago, says the Caspian Tern is not a rare bird on the lake in the early fall. "A few are seen each year at Miller's, Indiana. They are very shy, but I have managed to obtain four of them."

HELMINTHOPHILA BACHMANI (AUD.).

Bachman's Warbler.—A female of this rare warbler was taken May 2, 1899, near Greensburg, Indiana, by Mr. W. F. West. The captor says: "It had no song. It was taken from the lower branches of a large elm tree, situated on the bank of a small stream which flows through an open woods." The following is the description: Forehead, sides of head, upper neck and breast, bright yellow; crown and band across neck, black; belly and under-tail coverts, whitish; above, back of head and neck, grayish; back, wing coverts and edge of quills, tinged with olive green; upper tail coverts, bright olive green; wings, grayish; tail apparently same color; but two feathers, however, remain for determination. Length, 4.50; tail, about 2.00; wing, 2.37. Male.—Greensburg, Indiana, May 2, 1899, Col. W. F. West.

It is interesting to note this extralimital record of this rare bird. Its range is South America and the Gulf States west to Louisiana; Cuba in winter. It has been taken as far north as southern Virginia and Arkansas.

BIOLOGICAL CONDITIONS OF ROUND AND SHRINER LAKES, WHITLEY COUNTY, IND.

BY E. B. WILLIAMSON.

Whitley County is situated in the northeastern part of Indiana. It is bounded on the east by Allen County, of which Fort Wayne is the county seat; Columbia City, situated very nearly in the center of the county, is the county seat of Whitley County. Round, Shriner and Cedar lakes lie in the northern part of the county, above seven miles from Columbia City. Shriner and Cedar lakes lie parallel to each other, directly west of Round Lake, into which they empty their waters. Round Lake is drained into

Thorn Creek, which leaves the lake on the south, passing into Blue River, then into Eel River, and so into the Wabash.

The outlet from Shriner Lake to Round Lake is a narrow artificial channel. The connection between Cedar Lake and Round Lake is formed by a marsh, grown up with cat-tail flag (*Typha latifolia*), button-bush (*Cephalanthus occidentalis*), swamp loosestrife (*Decodon verticillatus*), and a variety of other marsh plants, with occasional stretches of open water.

But little time was spent about Cedar Lake. Its shores are covered with underbrush, and the bottom of the lake is so soft and, near the shore, so encumbered with tree trunks and branches that collecting is very difficult. A number of dragonflies were taken, but nothing was found here that was not observed at Round and Shriner.

Shriner Lake is one and one-quarter miles long, east and west, and one-quarter of a mile wide.* A small stream, which is dry most of the year, enters the lake at its southwestern part; but springs are almost the entire source of water supply. The temperature for some points at the bottom of the lake is as low as 50 degrees. The shores are sandy, and, with the exception of a portion of the northern part, solid and firm. Generally the bottom slopes rapidly from the shore line of deep water. The greatest depth is over seventy feet. Back from the water line the shores rise in low bluffs, covered with oak, maple and beech timber. A few sycamores and cottonwoods grow near the water's edge. About the western and northwestern parts of the lake the land has been cleared, and is now under cultivation.

The flora of the region is rich. Among the more conspicuous plants the following may be mentioned: Water-lily (*Nymphaea odorata*), spatterdock (*Nuphar advena*), water-shield (*Brassenia peltata*), bladderwort (*Utricularia vulgaris*), stiff white water-crowfoot (*Bidens Beckii*), water-weed (*Elodea Canadensis*), cat-tail flag (*Typha latifolia*), arrow-head (*Sagittaria*), pickerel-weed (*Pontederia*), several species of pondweeds (*Potamogeton*), pipewort (*Eriocaulon septangulare*), bulrush (*Dulichium arundinaceum*), several species of spike-rush (*Eleocharis*), several species of bullrushes (among them *S. atrocircus*, *S. lineatus*, *S. Americanus*, and *S. lacustris*), beak rush (*Rhynchospora glomerata*), bog rush (*Juncus Canadensis* var. *longicaudatus*), and several species of *Cyperus*. Thistles, goldenrods, asters, mints, knotweeds (*Polygonum*), and blue flag (*Iris*), with a variety

* For this and a number of other facts I am indebted to the Biennial Report of Mr. P. H. Kirsch, State Fish Commissioner of Indiana, for the years 1895 and '96.

of grasses and smaller sedges cover the shores. In adjoining woodlands I have found two species of orchids, the nodding pogonia (*P. trianthophora*) and the coral-root (*Corallorhiza odontorhiza*).

Round Lake is seven-eighths of a mile long and one-half of a mile wide. The water supply is derived from Cedar and Shriner lakes. Round Lake is shallower and warmer than Shriner and the water is less clear. Excepting small stretches of sandy beach along the northeastern and southern sides, the shores of the lake are soft and miry. The dredging of Thorn Creek has lowered the lake until at several places at a distance from shore the potamogetons reach the surface of the water. Lowering the lake five feet more will fill it with sand bars or even reduce it to a number of ponds. An extensive tract near the head of Thorn Creek, which five years ago was a swamp, is now under cultivation. Among the farmers of the neighborhood the practice is common of planting artichoke among the spatter-dock where the lowering of the lake has exposed the land. In the fall this is turned over to hogs and their persistent rooting in the soft earth pulverizes and dries the soil most effectually.

The vegetation about Round is ranker even than about Shriner Lake, and spatter-dock (*Nuphar*), which is rather rare there, almost surrounds this lake. In September, 1897, my friend, Mr. C. C. Deam, of Bluffton, Indiana, found the reversed bladderwort (*Utricularia resupinata*) growing along the western shore. Greater bladderwort (*U. vulgaris*) is abundant, and with potamogetons, eel grass (*Vallisneria*), hornwort (*Ceratophyllum*) water-milfoil (*Myriophyllum*), and stiff white water-crowfoot completely clothes the bottom of the shallower parts of the lake.

Not only is the vegetation more luxuriant about Round Lake than about Shriner, but the former lake seems biologically richer in every way. Shriner is a beautiful, deep, clear, blue reservoir of spring water, while Round Lake is a warm, shallow basin, surrounded by marshes, and containing the overflow of two lakes, and the drainage of neighboring woods and fields. Mr. Kirsch has recorded twenty-one species of fish for Shriner Lake and twenty-five species for Round Lake. I have not observed any crawfish at Shriner Lake, but about the shores of Round Lake the burrows and chimneys of *Cambarus diogenes* are common. While the two lakes have each furnished about the same number of species of dragonflies, these insects are usually much more numerous about Round than about Shriner.

Of the vertebrates of this region the following species may be noted: Mammals—moles, shrews and mice are common. Gray squirrel (*Sciurus carolinensis*) are rare, fox squirrels (*S. niger* var. *cinereus*) common and red squirrels (*S. hudsonicus*) and chipmunks (*Tamias striatus*) abundant. Minks (*Lutreola vison*), weasels (*Putorius noveboracensis*) and 'coons (*Procyon lotor*) are common; and woodchucks (*Arctomys monax*) burrow in the hillsides in considerable numbers. Birds: Green herons (*Ardea virescens*) visit the lakes frequently, great blue herons (*Ardea herodias*) rarely; Virginia rails (*Rallus virginianus*) and least bitterns (*Botaurus exilis*) have been occasionally observed. Red-winged blackbirds (*Agelaius phoeniceus*) are very abundant. Summer yellow-birds (*Dendroica aestiva*) nest in numbers in the button-bushes in the marshes. In 1895 long-billed marsh wrens (*Cistothorus palustris*) nested in the vicinity of Round Lake, but during 1898 none were seen or heard. During 1896 a loon (*Urinator imber*) spent the summer at Shriner Lake, where it might have been seen almost any day. Sandpipers (*Actitis macularia*) and killdeers (*Aegialitis vocifera*) are common. An occasional Bartram's sandpiper (*Bartramia longicauda*) is seen in flocks of the latter species. Reptiles: Of the turtles the western painted turtle (*Chrysemys marginata*), mud turtle (*Amblochelys odorata*) and snapping turtle (*Chelydra serpentina*) were the only species observed. These three are common or abundant. Three species of snakes are often observed about the lakes: Water snake (*Tropidonotus sipedon*), garter snake (*Eutania sirtalis*) and riband snake (*Eutania saurita*). The blue lizard (*Eumeces fasciatus*) is not rare in adjoining woodland. Amphibians: Spotted frogs (*Rana virescens*) are very abundant, and bullfrogs (*Rana catesbeiana*) rather rare. Fish: An abundance of game and food fish are found in these lakes. Of the two Round Lake is regarded as affording the best fishing grounds. Yellow perch (*Perca flavescens*), large-mouthed black bass (*Micropterus salmoides*) and a number of species of sunfish (*Lepomis*) are those most usually taken. Catfish, both the yellow cat (*Ameiurus natalis*) and bullhead (*Ameiurus nebulosus*), and pike (*Lucius lucius*) are more rarely met with. Occasionally the calico bass (*Pomoxis sparoides*) and the warmouth (*Chaenobrythus gulosus*) are taken in considerable numbers about the east end of Shriner Lake. The latter species is called mud bass, and the calico bass is referred to as rock bass by the local fishermen. This confusion of common names is odd for the reason that, while the warmouth (*Chaenobrythus gulosus*) much resembles the rock bass

(*Ambloplites rupestris*) the calico bass (*Pomoxis sparoides*), to which the name "rock bass" has been applied, has but little general resemblance to this fish.

Molluscans are rare about either lake, but are more common about the eastern shores of Round Lake than elsewhere.

Of the insects, Neuroptera, Orthoptera and Diptera are most numerous. Lepidoptera, Coleoptera and Hymenoptera are less conspicuous. The Odonata fauna is the richest and most characteristic. On June 8, 1898, the air was alive with larger species, and in the shore-line grasses and sedges smaller forms swarmed in countless numbers. From May until December they are fully entitled to rank as the most attractive and interesting insects of this region. Strong and fierce, constantly warring among themselves, so far as observed in the perfect-winged state they suffer defeat from only one quarter. In the webs of a species of large black and yellow spider (*Argiope*) I have found the remains of *Argia violacea*, *Libellula pulchella* and *Mesothemis simplicicollis*. Of the two latter species only very teneral individuals were found so entrapped. Sunfish often dash at Libellulas when they are ovipositing, but I have never seen the dragonflies injured by these attacks.

The only two common names I have heard used in northern Indiana for the insects are "snake-feeders" and "snakedoctors." The belief that they can sting is almost universal. To the good people living about the lakes in Whitley County the occupation of the collector is beyond understanding. From his first appearance till his final departure he is plied with questions, his answers only confirming his questioners in their notions as to his mental instability. Among other questions I may record the following: "Are you getting snake-feeders for bait?" "To eat?" "To use their wings to make picture frames or ornaments?" "Or is there a bounty on them?"

THE EYES OF CAMBRUS PELLUCIDUS FROM MAMMOTH CAVE.

BY F. M. PRICE.