

(*c*) A few well-known facts are emphasized, the variableness of the atmosphere and the persistence of the water; that water is a poor (*b*) radiator and an indifferent conductor of heat, and responds slowly to atmospheric changes.

(*d*) It shows also that the great volume of Syracuse lake at no time has been stagnant, but that a condition of activity has obtained throughout the entire period of observation.

(*e*) For the four months in which a large number of observations were made the general average of the water, both surface and bottom, is higher than that of the air.

A difference of 10° between the water one foot deep near the shore and the surface mid-lake during a rain the day the ice left the lake, shows that the surface drainage is no small factor in winter and spring in raising the temperature of the whole body.

PART II. THE INHABITANTS OF TURKEY LAKE.*

PLANKTON.

By plankton, Hensen, the author of the word, means everything floating in the sea and passively driven about by the waves and currents. Haeckel includes under plankton all organisms swimming in the sea. Haeckel says: "The totality of the swimming and floating population of the fresh water may be called limnoplankton." Limnoplanktonic studies have been made whenever a collector scooped for protozoa, diatoms or other minute organisms. Planktonic studies of this sort have been carried on for a long time. Recently plankton has been studied in a new way, first in the ocean and more recently in fresh water. This more recent study has been the quantitative and qualitative estimation of the plankton in a given volume of water. There seem to have developed in a remarkably short time two schools of planktonists, the one headed by Hensen asserting that planktonic organisms are uniformly distributed, the other, headed by Haeckel, being equally sure that planktonic creatures are to be found in clouds or schools. We are interested in plankton only in so far as it is part of the environment of the vertebrates inhabiting the lake. That it is not an unimportant element of the environment is due to the fact that it forms the primitive food of most of the fishes and that at the most plastic period in the life of the individual. The amount of plankton, as well as its composition from year

*Contributions from the Zoölogical Laboratory of the Indiana University, No. 16.

to year, is therefore of prime importance in the search for the causes of the differences in the same fish in two contiguous lakes or in two successive years in the same lake.

Our plankton apparatus was completed too late to enable us to make any systematic measurements, especially as our planktonist was actively engaged in the physical survey of the lake. But plankton was collected and some of its different constituents will be reported upon.

A good historical account of planktonic studies, as well as exact definitions, are to be found in the Planktonic Studies of Haeckel, translated by G. W. Field, and published in Commissioners' Report, 1889-91, U. S. Com. Fish and Fisheries, pp. 565-641.

In the following sketch several groups of animals are not at all considered and others but briefly. The only groups found in the lake of which we approximate a complete list are the fishes, batrachians and reptiles. Deficiencies will be removed in subsequent reports when a classification of the material into *littoral*, *bathybial* and *pelagic* will also be attempted.

PROTOZOA.

The *Protozoa* were not represented by a large array of species during the summer. No detailed work has been done on them as yet, but I want to mention two characteristic forms.

The most striking *Protozoan* is *Ophridium*. It is found in clumps varying from microscopic minuteness to the size of walnuts, and in different parts of the lake the pebbles and exposed parts of clam shells are covered with these colonies to such an extent as to suggest young lettuce beds.

Ceratium hirudinella is as striking and abundant in the *pelagic* regions as *Ophridium* is in the *littoral*.

In this connection two plants may also be noticed.

Rivularia is very abundant during the whole summer. It is conspicuous in calm weather, when it rises to the surface. Toward the end of August and in early September it collects in such numbers as to form large patches and streaks, forming a true *Wasserblüthe*.

Various forms of *Palmella* are abundant during the whole summer, and in October, when *Rivularia* has disappeared, it forms large patches on the surface forming the *Wasserblüthe* of the late fall.

PORIFERA.

Sponges are not abundant in the lake. They are found in small patches on boards, sticks and other things near the margins of the lake. They grow much more luxuriantly in the outlet of the lake where they sometimes form patches several square feet in extent.

CNIDARIA.

Hydra viridis L. Specimens of *hydra* were exceedingly rare. On one occasion a few were taken on a submerged stick near Black Stump Point.

PLATHELMINTHES.

Flat worms were not systematically collected and none of these collections have been identified. Of *Turbellarians* there were several species. *Amia calva* is infested by a tape worm and by a *Distomum*.

NEMATHELMIA.

No attempt was made to collect thread worms. *Gordius* is exceedingly abundant on the margins during the latter part of summer. I counted as many as twelve in the area of one foot square.

ANNELIDA. BY BESSIE C. RIDGLY.

No *Chaetopoda* were collected.

No systematic attempt was made to get large numbers of leeches, but specimens were preserved whenever found. In the classification I have followed Verrill.

Nepheleis quadristriata Grube. Thirteen specimens from Turkey Lake.

Nepheleis ferrida Verrill. Fourteen specimens.

Clepsine parasitica Diesing. Three specimens.

Clepsine ornata stellata Verrill. This species was not found in Turkey Lake. Two specimens were taken in Tippecanoe Lake.

Clepsine ornata rugosa Verrill. Four specimens.

Clepsine ornata variety d Verrill. Ten large specimens corresponding with the second specimen described by Verrill were found, most of them on turtles.

Clepsine papillifera Verrill. One specimen.

Clepsine papillifera carinata Verrill. Three specimens. One of these, one-half inch long, was found under a stone in front of the laboratory. A number of young were attached to it.

Clepsine pallida Verrill. One specimen.

Clepsine pallida variety b Verrill. One specimen.

Clepsine elegans Verrill. Five specimens.