Ecological Notes on Certain White River Algæ.

Paul Weatherwax.

During the summer of 1913, while assisting in a sanitary survey* of the West Fork of White River, the writer took advantage of the opportunity to make a study of the algæ in the stream. The work was begun at Martinsville, Ind., near the close of June, and ended at Mt. Carmel, Ill., about the middle of September, more or less hurried investigations being made along the river near several of the larger towns.

Only such forms were considered as were present in quantities sufficient to be conspicuous to the unaided eye, no attempt being made to secure specimens by filtration. The striking condition was the general scarcity of algæ, especially along the lower part of the river.

For four or five miles in the neighborhood of Martinsville the shallow parts of the river were choked with a growth of *Cladophora glomerata* Kg. and *Hydrodictyon utriculatum* Roth.; and large masses composed of species of Oscillatoria, Desmids, and Diatoms were continually floating down the river. This material had evidently been broken loose from where it had grown further up the river or some of its tributaries, for it did not continue in a growing condition but eventually broke up and disappeared. The Cladophora gradually became less noticeable in the deeper water a few miles below Martinsville and was afterwards seen only occasionally and in small quantities. The Hydrodictyon was in well-defined locations in water that was comparatively quiet, and, although it was rapidly reproducing, and the young nets were seen floating even far below Spencer, it apparently did not find suitable conditions for growth far below Martinsville. Spirogyra, Mesocarpus, and Zygnema were found in small quantities in a few places, but they were not fruiting and usually showed signs of disintegration. Numerous species of Diatoms were present in the shallower places all along the river.

* This survey was conducted by the Indiana State Board of Health Water Laboratory. To State Water Chemist, Jay A. Craven, I am much indebted for some of the data and other information that have led to the publication of this paper.

The scarcity of algæ can best be explained by considering the nature of the river itself. Along the lower part of the West Fork and the entire course after the two branches unite the river follows a meandering course through a loose, sandy soil; and, by a gradual process of cutting the bank on one side and piling up sandbars on the other, it is continually changing its course. Then, along the straight parts of the stream the banks are generally steep, and there is little shallow water. When we consider at the same time that the current is comparatively swift, it is seen that only when the river is at its lowest stage are conditions at all favorable for the growth of algæ. Moreover, the conditions just preceding these investigations had been the worst possible, for the exceptional flood of the preceding spring had made such changes in the river bed that several years will be required to bring the plant life of the stream back to a normal condition.

The abrupt disappearance of algal growth just below Martinsville was accompanied by an improved sanitary condition of the water. These two conditions were due, in part, to a series of long, deep stretches of quiet water which acted as septic basins for the polluted water and were also too deep for algæ. It is probable, too, that the algæ above these deep parts aided materially in purifying the water by releasing large amounts of oxygen which went into solution and hastened the putrefaction of organic matter.