NOTES ON THE ALGAE OF COOK COUNTY

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Among the numerous and various species of algae which abound in the ponds, ditches, and sloughs in the vicinity of River Forest, a few forms have been of particular interest.

In June, 1923, a small pond, at that time apparently more or less permanent, near Palos Park in the Cook County Forest Preserves, offered some especially attractive material. Three successive visits were made to this pond in the month of June that year, and quantities of material representing many genera of the Cyanophyceae, Chlorophyceae, and Diatomaceae were found. Fruiting plants of Oedogonium, Bulbocheate, Zygnema, Mougoetia, and several species of Spirogyra were included in the collections. One species of Spirogyra (fig. 1) seemed to resemble the plant described by Miss Merriman in 1921 and which she called *Spirogyra rectispira*. With respect to the arrangement of the chloroplastids, this plant seems to correspond with Miss Merriman's description.

At the same time an abundance of fruiting *Mougoetia mirabilis* was found. This plant as we have identified it, was found by Wittrock in 1872, and his figures are reprinted by Oltmanns. As reported and figured by Wittrock, the plants found at Palos Park were conjugating, some of the filaments by the scalariform method only (fig. 2), many more by the lateral method only (figs. 3 and 4), and there was not a little of the material in which many of the filaments participated in both types of conjugation (fig. 5). The material was fruiting so profusely as to form a perfect network and exhibited many bizarre and irregular forms (fig. 6-13), among them (fig. 13) twin or, possibly, parthenogenetic spores.

In looking over the literature, particularly that which is less recent, it seems that this plant has been paraded under several different generic names and that a number of species have been distinguished, with differences, especially those based on the methods of conjugation, which can probably all be reconciled in this single species. Borge, however, in 1913 resolved the whole of the family Mesocarpaceae into a single genus (nur eine gattung") and this genus is Mougoetia. Fremy reported this double method of conjugation for *M. capuciana* in 1924. Aside from this and Wittrock's

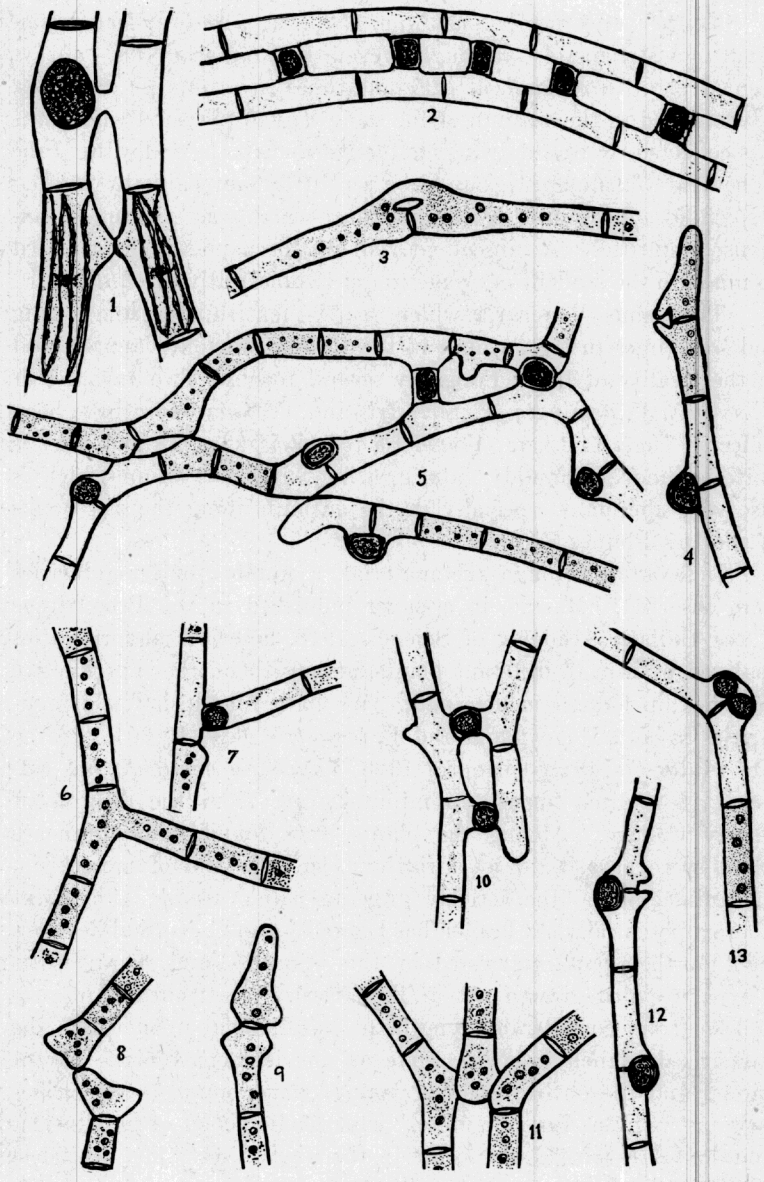

Plate I.

report for *M. mirabilis,* there seems to be no other written account of the two kinds of conjugation in a single filament.

Neither since nor before June, 1923, have we ever found conjugating Mougoetia, although vegetative material has always seemed plentiful enough at different times in a number of places. We returned in the autumn of the same year to the pond where this was collected, to find only sterile plants, and in the following June to be again disappointed but to be repaid for our pains by making a splendid collection of *Volvox globator* which was growing in immense quantities. A subsequent visit to this pond which promised so much to the student of Algae found it practically dried up.

The genus Vaucheria which fruits plentifully in the spring and sometimes in the autumn in the Chicago region is represented in the locality of River Forest by several forms. Two varieties of *V. sessilis, V. geminata, V. terrestris* and *V. macrospora* have been collected (figs. 14-18a). *Vaucheria terrestris* (figs. 18 and 18a) is quite common on muddy flats, growing with Botrydium which is also very abundant especially in the autumn along the wet banks of the Des Plaines River.

In looking through the material, a number of irregularities were observed. Markle, in a paper published in the Proceedings of the Indiana Academy of Science, 1918, describes abnormalities observed by him in different plants, among them, the reproductive branches of *Vaucheria geminata.* We have found similar irregularities in both *V. geminata* and *V. terrestris* (figs. 19-20). In the late winter and early spring of 1928, *Vaucheria geminata* was collected in a ditch about ten minutes walk from the campus of Rosary College. Among the plants were found many branches which were parasitized by a rotifer. In this kind of parasitism, the animal enters the actively growing plant, usually at a point where a potentially sex branch has begun to grow. Normal development of the plant is arrested by this stimulus, and there results a hypertrophied growth not unlike a gall. Contributions of protoplasm from considerable lengths of the filament upon which the parasitized branch is borne, serve as nourishment for the parent animal and the entire brood of young, which numbers sometimes up to as many as forty or more. This phenomenon of gall formation doubtless most often occurs in the way we have just described (fig. 21), but it seems not unlikely that the tip of a filament in which there is the possibility of the development of a zoospore may also serve as host material for the parasite (fig. 25).

The germinating oospore or zoospore, whichever figure 26 may be, also adapts itself to gall formation. Probably all the parasitized material in our collection was that of *Vaucheria geminata* which figure 27 proves conclusively. Miss Rose Kerber in an unpublished paper on the Algae of the Chicago region described this parasitism in *Vaucheria sessilis*. The plants collected by Miss Kerber were found in the autumn.

This relation between Vaucheria and the Rototoria may or may not be common; little about it, however, was noted in the literature. An instance of it in *V. dichotoma* is cited by Heering and the following statement is made in British Freshwater Algae by West and Fritch: "The threads are sometimes subject to the attacks of the rotifer, *Notomata Werneckii* which produces irregular gall-like swellings."

The conclusion is that a number of species, possibly all of the Vaucheriaceae, may respond as hosts to the Rototoria, and that any part of an actively growing thallus in which there is a sufficient food supply, whether this be a developing sex branch, a zoospore formation, or such organs as germinating oospheres and zoospores, may, if stimulated by the entrance of a rotifer, develop into a gall.

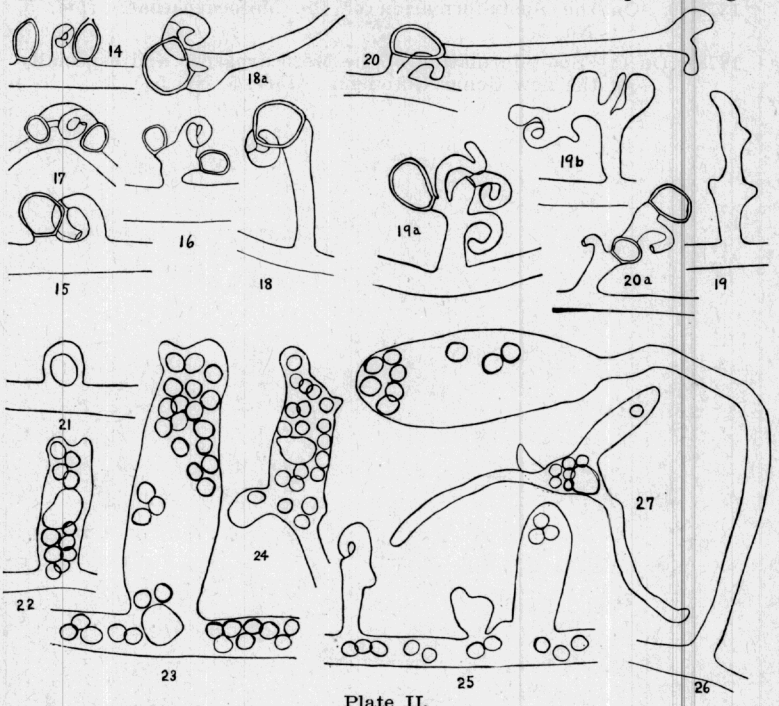

Plate II.

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