

CONJUGATION IN SPIROGYRA.

BY F. M. ANDREWS.

A large quantity of *Spirogyra crassa* and *Spirogyra communis* were found in September in a pond and upon examining it both forms were found to be conjugating. Not only was the species *Spirogyra crassa* found conjugating together, but sometimes *Spirogyra crassa* was found conjugating with *Spirogyra communis*. The smaller one of the two filaments in Fig. 1 is *Spirogyra communis* and the larger one *Spirogyra crassa*. The contents of the majority of the cells pass from the larger species to the smaller ones forming a zygospore, and in other cases the contents of most of the cells of *Spirogyra communis* pass into the cells of *Spirogyra crassa*. Some of the forms here shown which had not begun to conjugate began and completed conjugation when brought into the laboratory. In an earlier paper I have called attention to the interesting facts the hybrid forms may show.¹

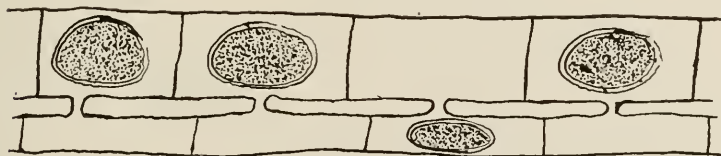


Figure 1.

Generally it is the case that when *Spirogyra* is conjugating the contents of the cells of one filament will all pass over into the cells of the other filament near it, as text-books and authors state. This is by no means always the case as is shown by Fig. 2.² In some cells, as will be seen at A and B, Fig. 2, the contents of the contiguous cells in the same filament go to corresponding contiguous cells in the other filament, but the contents of other cells as C and D, Fig. 2, do not do so, but go in the

¹ Andrews, F. M. Bulletin of the Torrey Botanical Club, Vol. 38, p. 296.

² Bennett and Murray. p. 266.

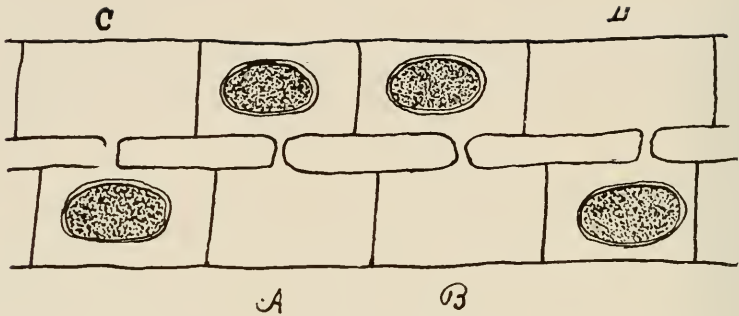


Figure 2.

opposite direction. A case of this kind is also shown by A. Tröndle¹ and in the above mentioned form.

In some other cases, as has been found before, three filaments of *Spirogyra crassa* conjugate with one another² without regularity, as is seen in Fig. 3. Part of the time the contents of the cells move from the filaments A to B, in some cases from B to A and in others from B to C.

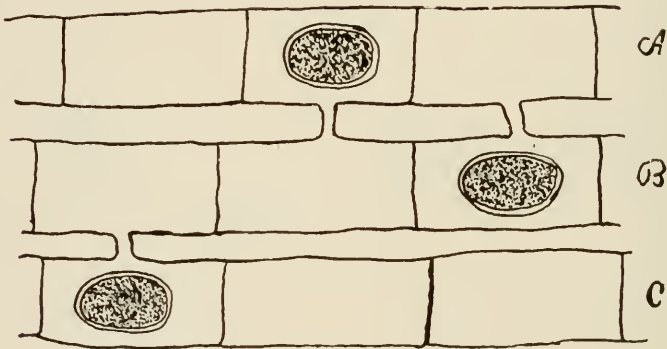


Figure 3.

In another instance in this material three filaments of *Spirogyra crassa* were found connected by conjugating tubes.³ In Fig. 4 the cells of the two outer filaments A and C were in some cases conjugating with the cells of the filament B, and thus forming a single Zygospore from the con-

¹ A. Tröndle—Über die Kopulation und Keimung von *Spirogyra* Botanische Zeitung, 1907. Vol. 65, p. 192.

² A. Tröndle l. c.

³ Bennett and Murray, Cryptogamic Botany, p. 267.

tents of three cells. In this case the Zygospore is not apparently much larger than where two cells fuse, so that the decrease of turgidity causing the contraction of the protoplast is in this case very great.

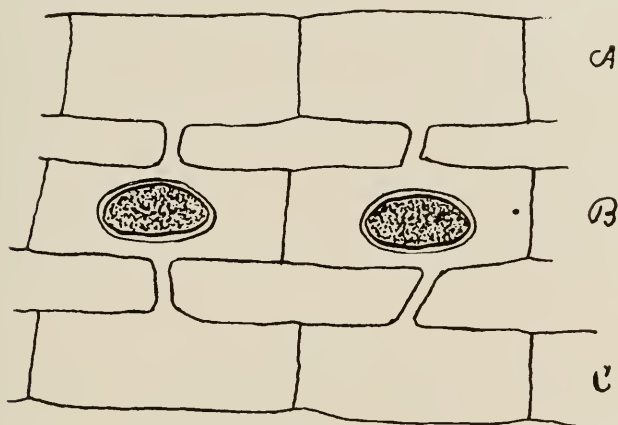


Figure 4.

In still another lot of the specimens, four filaments were found conjugating with one another as in the last case. Most of the cells were conjugating in the usual way, but others conjugated with each other in whatever filaments were near them without regard to regularity. They formed quite a mat of filament.

Some specimens were noticed each of whose cells in conjugating put out two conjugating tubes to the neighboring cell. Only one of these tubes, however, seemed to be completed and to serve as a channel for the transfer of one cell to the other.

