

X.—On Certain Filaments observed in *Surirella bifrons*.

By JOHN BADCOCK, F.R.M.S.

(Read 9th April, 1884.)

On the 5th April I collected some very fine diatoms from the noted Keston bog, among which examples of *Surirella bifrons* were very conspicuous, both by their abundance and size, and also by their very clean and active condition.

Selecting one for special attention, I noted that in its passage across the field it would occasionally *pass close to* certain small collections of vegetable débris (but without actual contact), when these small matters seemed to be caught by some projecting filament from the diatom, by which they were carried along with it for some distance. Then the diatom would free itself, but, coming in contact in the same manner with other similar material, the same thing would happen again.

Observing this very often with only a $\frac{2}{3}$ in. objective, I tried a higher power. With the $\frac{1}{4}$ in. I could not discover any more than before the cause of the phenomenon. At length, however, with a $\frac{1}{2}$ in., which had been altered for use with the binocular arrangement, I discovered certain fine filmy processes projecting irregularly from the diatom, and which appeared to have caused this disturbance. Further and repeated observation confirmed my conviction of a correspondence between these projecting filaments and the disturbances noted, the significance of which could not be mistaken.

I now called my son, and asked him if he saw anything exceptional, and to sketch it for me. This he did, as shown in figs. 49 and 50. The filaments were seen repeatedly and very dis-

FIG. 49.

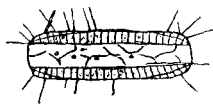
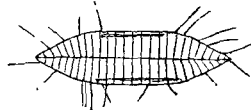


FIG. 50.



tinctly by both of us, whether the front or the side of the diatom was in view.

My attention was not confined to *one diatom* only. The appearance showed itself in many, but not in all, and there was a very perceptible difference in its development in different specimens.

I had been observing some *Arcellina* from the same gathering

in which the *Surirella* were found, and was struck with the similarity between the filmy projections in *Arcella difflugia* with those of the diatom. Although those of the *Arcella* were much larger, yet the fine *non-granular* character was the same, as also their variableness and irregularity. They were simply as fine pencil shadings or smoke-like semi-transparent films, which in the *Arcella* were larger and of a more pronounced character than in *Surirella*, yet of the same amœboid nature in both.

As I was thus led—accidentally as it were—to compare these two forms of life, it seemed to me that the only *essential* difference between them was one of size. In this light one could hardly regard the diatom as of the vegetable kingdom pure and simple. However, my object is not to raise this vexed question of animal or vegetable nature, but simply to put on record my observation of these filmy protuberances as corroborative of previous observations made and recorded by other and more eminent workers in this department, but which of late years have been generally either ignored or considered as of no special significance.

I will only say that had I not seen a diatom before, or known anything of its classification, I should certainly have regarded this *Surirella* as a testaceous *Amœba*.

The special optical power and arrangement necessary to see this phenomenon in the diatom may be a subject of interest. I have only one objective with which I can see it distinctly (a 1/2 in.). It was strange and inexplicable to me that neither a higher nor lower power revealed it.

Now, whether there is any physiological problem involved, or any special relation between the structure of the eye and this particular optical power, may be a question worth further investigation by those competent to undertake it. I merely throw it out as a suggestion, which may or may not be worth anything. One thing is, however, desirable, and that is that such special aids should be sought as would enable any one readily to verify such observations for himself, for it seems certain that disputes arise and contradictions are made which a little more attention to this point would probably prevent.