

It has already been observed that in some living species of *Chætoceros*, *Goniothecia* in embryonic stages occurred, and for this reason Brightwell,¹ by analogy, has maintained that the three above-named genera are not organisms *per se*, but dependent and subordinate parts of species of *Chætoceros*.

In confirmation of this conclusion, I have repeatedly observed conditions such as are represented on Plate XIX. figs. 7 and 8, in which there may be seen frustules of *Dicladia capreolus*, Ehrenb.,² enclosed in frustules of *Chætoceros*, and as no substantial difference is found between *Dicladia* and *Syndendrium*, the non-independent character of these genera is manifest. But what can be the significance of this singular organic siliceous body enclosed in a Diatom cell, and itself constituting another cell? It would seem as if its sporangial nature was beyond doubt, and it must accordingly be regarded as designed for the reproduction of the species.

This interpretation of the so-called *Dicladia*, *Goniothecium*, and *Syndendrium*, is a confirmation of the opinion of Dr Wallich, who, instead of, like some others, viewing the sporangial frustule as a means of restoring to its original dimensions a Diatom which had been diminished in size by successive divisional processes, viewed it not as a normal and independent organism, but as a transient monstrous form designed for the elaboration of spores or embryonal forms, and therefore capable of reproducing the species.

"In fact it had been observed that every species, by the process of conjugation, must be represented under two forms, one large and the other small, between which a gap exists, over which we have at present no means of bridging except by supposing that the two halves formed in cell division need not always be equal, and that by dwindling away through a succession of steps of this kind, the progeny of the sporangial frustules may be reduced to the original size." But that this does not happen may be shown by recalling what takes place in *Cocconema*, Ehrenb., in a collection of which it is easy to observe the sporangial, accompanied by the normal and much smaller form, without being able at the same time to recognise the gradual diminution of the frustules by which the extreme dimensions are reunited. (See vol. i. pl. xxiii., and vol. ii. pl. C, Synopsis of the British Diatomaceæ.) Moreover, the same fact is shown in a still more convincing manner by an observation made by Prof. Hamilton L. Smith on the *Stauroneis gracilis* of Ehrenberg.³ This well-known naturalist recognised that the sporangial form is the same as that which Ehrenberg called *Stauroneis phænicenteron*⁴—a type which greatly differs from the former in the delicacy of its striation, so that, instead of being regarded as a specific and independent form, the latter must be looked upon as but a transitory reproductive form of *Stauroneis gracilis*, Ehrenb.

¹ Brightwell, *Quart. Journ. Micr. Sci.*, vol. iv. pp. 105–109, pl. vii. figs. 53–60.

² Ehrenberg, *Mikrogeologie*, pl. xxxv. A. 17, fig. 8.

³ Ehrenberg, in Kützing's *Bacill.*, pl. xxix. fig. 3; Smith, *Synopsis of the British Diatomaceæ*, vol. i. p. 59, pl. xix. fig. 186.

⁴ Kützing's *Bacill.*, pl. iii. fig. 53; = *Navicula phænicenteron*, Ehrenberg *Infus.* pl. xiii. fig. 1; Smith, *op. cit.*, vol. i. p. 59, pl. xix. fig. 185.