

Bacillariaceæ, two others, namely, a water-like fluid substance, and oil globules differing in size. These latter occur swimming freely in the cell, but abound upon the inner surface of the plasm-sac. In consequence of their strong refractive power, they strike the eye at once, and are changed into a black colour by the use of osmic acid. As they readily combine, they have no skin. The author's experience confirms the observation of Luders, that in proportion as the oil abounds, the cells have suffered from the want of pure water. The appearance of the larger oil-globules is a sign that the cell has attained its full maturity and exhausted its resources.

The oil-globules afford a means of answering the question whether the cell-contents are of a watery or of a gelatinous consistency. In favour of the former view, Dr. Pfitzer refers to the fact that very weak acid produces an immediate shrinking of the plasm-sac, as also to his observation that the oil-globules can be moved about with facility, which could not happen if the surrounding matter were of a gelatinous nature. The opinion of our author on this subject is corroborated by Focke, who discovered that the oil-globules, in consequence of their light specific gravity, accumulate on the upper surface of the cell, and change their position in case the frustule is turned upside down.

Remarks on DR. NITSCHE'S RESEARCHES on BRYOZOA.
By PROFESSOR SMITT.

IN the 'Zeitschrift für wissenschaftliche Zoologie,' Bd. vi, Hft. 4, Doctor Hinrich Nitsche has published his "Beiträge zur Kenntniss der Bryozoa," of whom you already, in April, 1871, had received and published an extract—"On some Interesting Points concerning the Mode of Reproduction of the Bryozoa." In these excellent papers you will find a critique of my views on the subject, as well as very good additions to my observations; but I am sorry to find that the distinguished doctor in many points has mistaken my meaning and overseen my statements, without doubt because of the difficulties of the language.

Thus I never have said, and could not think any one should impute to me such a thought ('Zeitschr.,' l. c.; p. 446), that the zoœcia in the common-bud differentiate themselves centripetally from the peripheral margin of the bud. Any

one who regards my figures of the budding of the *Crisiæ*, or *Diastroporæ*, or *Flustra*, even without understanding the Swedish language, will at once see that such an opinion would be an absurdity.

As to the theoretical difficulties he has raised ('Quart. Journ.,' April, 1871, p. 157) against my theory of the common-bud as belonging to the colonial life, viz. the theoretical impossibility of mere individuals in community contributing to this budding, these difficulties must disappear for the truth that younger zoœcia are differentiated from the older ones along the whole *tame germinale* (D'Orb.), before the latter are full-grown, and this with a continuity (e. g. *Diastropora*) that leaves no doubt that the budding is going on as a common function of the colony. It is principally from the *Cyclostomata* that this theory most easily will be understood; but even in the *Chilostomata*, although there the individual life is more developed, the commonness of the budding is perceptible, though it gradually approaches the simple budding by the uniserial forms (*Eucratea*, &c.).

As to the structure and development of the endocyst (mantle), Dr. Nitsche, in the most pregnant mode, confirms my observations on *Vesicularia* and *Membranipora*, and he just cites the place ('O'fvers. Vet. Akad. Förh.,' 1866, p. 519), where I have described the development of this structure in the same manner as he describes it himself ('Zeitschr.,' l. c., p. 453), but all that he knows of my observations is the notice (l. c., p. 493) that I should have doubted of the correctness of my former description of the net in the mantle.

As to his inner layer of the endocyst, the "*Spindelcellschicht mit anliegenden Körnerhaufen*," though I have not succeeded in seeing the true "*Spindelzellen*," it is the same layer within which I have followed the development of the *polyptide*, &c. This layer, which even Nitsche sometimes says to be missing. I have not separated from the "*floating cells*" in the perivisceral cavity, because, as anatomical features (as far as I have seen), they pass over into each other in their looser or closer aggregations; and as to their morphological significance and physiological function, they are developed in the same manner within the perivisceral (lymphatic) fluid, and seem to serve in the same manner for development or nutrition. Hence the whole controversy is concerning the name of that layer.

As to the so-called "nervous system of the colony," I have retained its older name, instead of giving it a new one, being unable to add anything that really could give it

another physiological significance. And, indeed, even in the excellent description of the "*Funicular-platte*" by Doctor Nitsche, I see good reason at least for studying this feature much more before leaving off the interpretation at first given by Fritz Müller. That it encloses more than nervous elements, especially in *Flustra membranacea*, is very obvious (cf. 'Ofvers. Vet. Akad. Förh.,' 1867, p. 32), but for awarding to this the physiological significance of the name of *funiculus* (Allm.), I think, is all too vague.

As to the germ-capsules, the Rev. Th. Hincks, without doubt one of the most excellent Bryozoologists, already has pointed out ('Quart. Journ. Micr. Sc.,' July, 1871) what is yet to say thereon. I did not answer the eminent Professor Claparède upon his objections against my theory, because I hoped he would continue his researches on these animals. Death has deprived us of this most glorious labourer in the field of scientific zoology. Now, Dr. Nitsche says I am right as to the development of these germ-capsules. As to the budding from them, I still trust to my observations, only calling to mind that the budding from the endocyst in the older Zoecia, by which Nitsche will explain the whole question, was known and described even by me ('Ofvers. Vet. Akad. Förh.,' 1864, p. 28) as a different mode of budding, that could be observed even in the atrophied zoecia without germ-capsules.

THE LUMINOUS ORGANS *and* LIGHT *of the* PENNATULÆ.
By Professor PANCERI, of the University of Naples.

THE memoir presented to the Academy under the title indicated above commences by the enumeration of the authors who have witnessed the phosphorescence of the zoophites in question. Although omitting the observers who limit themselves to stating the fact that light is emitted by the Pennatulidæ, I ought specially to mention Spallanzani, Blainville, Delle Chiaje, and Forbes, as having already described the luminous waves which are seen traversing these little polypes when they have been recently touched. Hitherto neither methodical experiments have been made towards determining the conditions of this phenomenon, nor special researches to discover whether these animals really possess true luminous organs. Formerly it was generally believed that the mucus which clothed the exterior of the branches