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LIX.—*Notulæ Lichenologicæ*. No. XXV.
By the Rev. W. A. LEIGHTON, B.A., F.L.S.

On the Germination of the Spores of Varicellaria.*
By Dr. W. Nylander.

TULASNE and De Bary have already written concerning the germination of the large-sized spores of Lichens, and have seen slender filaments extruded gradually on all sides from the walls of the spore, which filaments these celebrated authors regard as the first hypothalline developments, or beginnings of the thallus.

I have also seen the spores of *Varicellaria* (which are almost the largest-sized spores of all Lichens—see Nyl. Lich. Scand. t. 1. f. 8), when placed in a humid atmosphere or covered with water, to be similarly covered in a short time with slender circumradiant filaments. But at the same time I have seen other similar filaments to issue from the various adjacent fragments of the disrupted apothecium of *Varicellaria*. After a month's time, in some spores, these filaments (both those of the spores and of the other fragments) manifestly acquired a mucedinous character, and produced moniliform, hyaline, penicillate acrospores, and thus constituted a slender *Penicillium*. Afterwards, by continued culture, I have seen this *Penicillium* destroyed and vanishing away. But long before that, and contemporaneously with the protrusion of the filaments above mentioned, I have observed in the endospore a hyaline protoplasm, turbid in the middle, composed of very minute white granulations, which, as it were by coagulation, formed a solid white corpuscle (opaque as seen against the light) in the cavity of each cell of the spore—and that this afterwards gradually increased after the fashion of an embryo, and at length in the third month filled the entire cavities of both cells of the endospore. At the same time the wall of the two cells showed the concentric strata to have become sensibly looser, and was fissured by frequent fine transverse rimulæ (or strigulæ) (which same thing De Bary has observed, and which I myself have noted in *Pertusaria velata*, in Lich. N. Zeal., in Linn. Soc. Journ. ix. p. 253), preparing for its future dissolution, which a parasitic mucedinous vegetation would also promote. From the middle of the month of March to the middle of the month of June I have noticed these phenomena. The spores, then denuded of the filaments of the *Penicillium* (whose vegetation had passed away) displayed in the interior of each cell

* Translated from 'Flora,' Sept. 10, 1868.

a white corpuscle, which, towards the septum separating the cells, in most spores stretched out the sporal wall on one side. Thence I sometimes saw a white oblong corpuscle spontaneously expelled from either cell. When free (or partly remaining within the cells and partly protruded near the septum), these corpuscles became larger, and especially longer, than when enclosed within the spore, somewhat deformed, and unequal or almost cerebriform on the surface, but covered by no cellular membrane.

Here, unless I am deceived, is the beginning of the thallus of the Lichen; but I have been unable to pursue the ulterior evolution. Does, then, fecundation take place in these corpuscles? Their analogy would then be with the spores of the *Fucaceæ*.

Subsequently, in the warm summer, I experimented with other cultivations of the spores of *Varicellaria*; and, as in the former ones, I beheld the mucedinous filaments speedily and copiously evolved from all. But now the fructification of *Helminthosporium* (spores septate, black, pyriform, moniliform-proliferous, subfasciculate) appeared in these filaments, and the sporal wall became dissolved in a short time. Sometimes the corpuscles assumed a rose-colour. Too much heat (often about 30° C.) was injurious to this culture.

Observations of this kind are very easily instituted and explained; but in such experiments the natural conditions are so imperfectly imitated that consequently it is most difficult to attain to any knowledge of the physiology of Lichens.

Corrigenda.

In Dr. Nylander's paper on "Lichens in the Luxembourg Gardens" (Ann. & Mag. Nat. Hist. ser. 4. vol. ii. p. 245), I have inadvertently made some gross mistakes, which need correction:—

Page 246, line 5, for "hygrometer" read *hygiometer*.

Page 248, line 31, for "*Lecanora umbrina* = *Lecidea pelidna*, Ach." read:—*Lecidea umbrina* is identical with *Lecidea pelidna*, Ach., which latter name is to be preferred for this lichen, because we have a *Lecanora umbrina* (Ehrh.) and because it is desirable to avoid a similarity of nomenclature in genera which approach so closely to each other.

For "Hepp" read *Hepp passim*.

W. A. LEIGHTON.