II.—*Notes on British Lichens.*

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[Plate IV.]

I purpose, in this and subsequent papers, from time to time to present notes and illustrations of new or recently discovered British Lichens, or such as have not been figured and described in Sowerby's 'English Botany' and Supplement.

Gonionema, Nyl.

Thallus filiform; gonidial cells large, filled with granules, concatenated into a central axis. Apothecia biatorine or gyalectoid.

Gonionema velutinum, Nyl. Thallus dark brown, slender, entangled; apothecia dark brown, terminal, centre depressed, margin swollen, pale within; sporidia in asci 8, ellipsoid, simple, colourless; paraphyses slender.

Gonionema velutinum, Nyl. Prodr. 16 (1857), Syn. 88, t. 1. fig. 11 (1858), Scand. 23 (1861).
Collema velutinum, Ach. Syn. 329 (1814).

On the northern precipices of Craig Breidden, Montgomeryshire, June 1864.

This minute lichen grows in scattered or continuous patches on the face of the rock, and resembles in general appearance a coarse dense velvety pile, of a blackish-brown colour. It consists of minute, slender, cylindrical filaments, simple or branched, erect, uniform in height, crowded and entangled into a cæspitose mass. When moistened and viewed under the microscope, these filaments are found to consist of an outer fleshy or cartilaginous continuous membrane, of a darkish-brown or olive-tawny colour, within which is seen a central axis filling the entire external cylindrical membrane, formed of large globular or spherical cells concatenated in a moniliform manner, compressed longitudinally by juxtaposition, and thus giving the cells a transverse dilatation. On the external membrane being ruptured, the central axis in longer or shorter lengths extrudes itself, and is then seen to be of a pale dirty glaucous-green colour, and the cells to be filled with very minute spherical granules, which, on the application of diluted sulphuric acid, become of a reddish tinge. I did not observe any apothecia on the Breidden specimens; but the structure of the thallus in these so corresponds with an authentic specimen in fructification, received from Dr. Nylander himself, as to leave little or no doubt of their identity, notwithstanding a slight difference in the width of the filaments, most probably resulting from age and situation. The apothecia on

Dr. Nylander's specimen are very minute, appressed, and sessile on the upper extremities of the thalline filaments, and of a similar colour, depressed or gyalectoid in the centre, and surrounded with a thickish tumid margin, internally pale, and consisting of narrow linear-oblong asci interspersed among very slender paraphyses slightly swollen at the apices. Sporidia 8 in each ascus, ellipsoid, hyaline.

Dr. Nylander (*l. c.*) describes the spermogonia (which I have not seen) as pale, globular or turbinate, and terminal; spermatia oblong, short; sterigmata slender. He also says, the hymeneal gelatine becomes blue by the action of iodine, and finally of a vinous red.

PLATE IV. fig. 1. Portion of filament of thallus, magn. 330 times linear.
fig. 2. Central axis, magn. 330 times linear.
fig. 3. Cells of central axis, magn. 1200 times linear.
fig. 4. Asci and paraphyses, magnified 330 times linear.
fig. 5. Sporidia, magn. 1200 times linear.
fig. 6. Sterigmata and spermatia, after Nylander.

SPILONEMA, Born.

Thallus filiform, branched, fruticulose; granula gonima large, in transverse strata; apothecia lecideine, lenticular.

Spilonema paradoxum, Born. Thallus blackish brown, slender, cæspitose, entangled, branched; apothecia black, terminal, hemispherical, immarginate; hypothecium nigrescent; sporidia in asci 8, oblong, simple, colourless; paraphyses thick, articulate.

Spilonema paradoxum, Bornet! Trois Lich. Nouv. p. 4, in Mém. Cherb. Dec. 1856, tab. 1 & 2; Nyl.! Prodr. 17 (1857), Syn. 89, t. 2. f. 3 (1858), Scand. 23 (1861); Leight.! Lich. Brit. Exs. 347 (1858); Mudd, Man. 35 (1861).

On rocks near the Harlech turnpike, at Barmouth, North Wales, June 1856, in fructification.

Thallus forming larger or smaller, dense or scattered patches of a black olive-brown colour, on the bare surface of granitic rocks, presenting a dense cæspitose velvety aspect. Filaments of thallus erect, flexuose, and curved, entangled, irregularly and somewhat secundly branched, about $\frac{1}{8}$th of an inch in height. The extremities of the branches, when moistened and viewed under the microscope, are found to consist of a continuous outer membrane, of an olive-tawny colour, within which the large rounded or oblong gonidial cells are seen arranged in tolerably regular transverse strata. The older stems exhibit the gonidia more scattered and irregular, but still disposed in a distinctly transverse direction, and immersed in a dense cellular tissue. *Apothecia* terminal, minute, hemispherical, without any margin, black; hypothecium nigrescent. *Paraphyses* short, thick, arti-

culate, the apical cell slightly enlarged and dark coloured. *Sporidia* 8, in narrow asci, linear-oblong, simple, hyaline. *Spermogonia* (which I have not seen), according to Bornet and Nylander, lateral, tubercular, black; arthrosterigmata articulate; spermatia "ovoïdes, fort petites" (Bornet), "breviter cylindrica" (Nylander).

Even in a sterile state, this plant, which has a general resemblance to *Ephebe pubescens*, may be distinguished by attention to the regular transverse arrangement of the gonidia, which are also of much larger size than those of that plant, and altogether differently grouped together. The outline of the filaments in *Spilonema* is uniform, whilst in *Ephebe* it is crenate or wavy, arising from the minute rugosities or tuberculations of the surface corresponding with the internal strata of gonidia. I thought at one time that there was also a chemical distinction,—dilute sulphuric acid turning the old and young filaments of *Spilonema* to a dark-green colour, whilst in *Ephebe* the younger branches were coloured green, and the older stems reddish; but this character did not seem, after experiments on different specimens, to be satisfactorily constant.

It is to be feared that, at least in some copies of my 'Lich. Brit. Exsic.,' specimens of *Ephebe pubescens*, which grew in the same locality at Barmouth with *Spilonema paradoxum*, have been inadvertently inserted.

PLATE IV. fig. 7. Extremity of younger branch, magn. 330 times linear.
fig. 8. Portion of older stem, magn. 330 times linear.
fig. 9. Sporidia, magn. 1200 times linear.
fig. 10. Paraphyses.
fig. 11. Sterigmata and spermatia, after Bornet and Nylander.

EPHEBE, Fr., Born.

Thallus filiform, branched, fruticulose; granula gonima smaller, subtransversely arranged, in little heaps, two, four, or more together. Apothecia endocarpoid, in thickened portions of the thallus.

Ephebe pubescens, Fr. Thallus blackish brown, slender, cæspitose, entangled, branched, slightly rugulose. Sporidia 8 in asci, lineari-oblong or subfusiform, 1-septate, hyaline; paraphyses none.

Ephebe pubescens, Fr. S. O. V. 256 (1825); Bornet, in Ann. Sc. Nat. sér. 3. xviii. 170, t. 7; Nyl. Prod. 17, Syn. 90, t. 2. f. 1. & 17–20; Scand. 24; L. P. 1!; Moug. & Nestl. 358!; Heppe, 712!; Fellm. Lich. Lapp. Or. 2!

Summit of Pen-Maen-Mawr, June 1851. Harlech turnpike, at Barmouth, Caernarvonshire, June 1856. Rocks at Dartmoor,

J. Ralfs, Esq.! Rocks at Coachford, west of Cork, *J. Carroll, Esq.*!

This plant occurs in dense, entangled, decumbent masses, loosely attached to the rocks. Filaments rather coarse, and of a minute, tubercular, or scabrous appearance, dark brown, variously and irregularly branched. When seen moistened under the microscope, they are of an olive-brown colour; the granula gonima in the young branches and extremities of the branches appear transversely arranged, very similarly to those of *Spilonema paradoxum*; but in the larger and older stems they are more scattered and distant, and smaller in size, and are arranged somewhat irregularly transversely, in heaps of several together. The apothecia are immersed in subfusiform swollen portions of the thallus, at a little distance from the extremities of the branches, and are similar to those of *Endocarpon*, spherical, with brownish perithecia. *Paraphyses* indistinct, mucilaginous. *Sporidia* 8 in each ascus, oblong, elongated, shortly fusiform, 1-septate, hyaline. *Spermogonia* in lateral prominences; sterigmata simple; spermatia straight, cylindrical.

For the unravelling of the synonymy, see Bornet, *l. c.*

PLATE IV. fig. 12. Portion of older stem, magn. 330 times linear.
fig. 13. Sporidia, magn. 1200 times linear.
fig. 14. Spermatia and sterigmata, after Nylander.

I possess a plant from Dr. Nylander, without any locality, named *Pilonema contextum*, Nyl., which, from the general appearance and structure of the thallus, seems allied to the foregoing. It grows in dense entangled cæspitose masses, of a blackish-brown colour. The filaments are very much branched, and seem, when moistened under the microscope, to consist of longitudinal series of small moniliform granula gonima immersed in cellular tissue. There is no fructification on the specimen.

PLATE IV. fig. 14. Portion of thallus, magn. 330 times linear.
fig. 15. Granula gonima, magn. 1200 times linear.

Racodium rupestre, Pers., of which I have a specimen from Dr. Th. M. Fries, gathered at "Smolandia, Femsjo, 1851," and which I have gathered on rocks at Sychnant, near Conway, and on the High Rock, Bridgenorth, Shropshire, and have also specimens from Llandrindod (*Rev. T. Salwey*), Leicestershire (*Rev. A. Bloxam*), and Cleveland (*Mr. W. Mudd*), and which, according to a specimen received from Dr. Guthnich, from the collections of Schærer, gathered at "Tête Noire," and labelled "Collema pannosum, Schær. Enum. p. 248," would seem to be included in that species by that author. Of this plant a fair representation is given in Dillwyn's 'Confervæ,' tab. 101, as *C. ebenea*. Viewed under the microscope, it is found to consist

of minute filaments indistinctly septate, over which is spread a network of longitudinal fibres. No fructification has hitherto been detected. There can be little doubt of the lichenoid nature of this plant, the structure being similar to that of *Cœnogonium*. (See Karsten's Paper in Ann. Nat. Hist. ser. 3. vol. viii. p. 203, pl. 11.)

PLATE IV. fig. 16. Filament, magn. 330 times linear.
fig. 17. Filament, magn. 1200 times linear.

Chroolepus Arnottii, Hook., of which I have an authentic specimen gathered "Kinross-shire, July 7, 1837," approaches these plants in external aspect; but the microscope shows it to consist of branched filaments of spherical cells, of a rich chocolate-brown, tapering towards the extremities, where a distinct conjugation may be seen.

PLATE IV. fig. 18. Filament, magn. 330 times linear.
fig. 19. Conjugation at extremity of filament, magn. 330 times linear.
fig. 20. Conjugation, magnified 660 times linear.

Lichina pygmæa, Ag. (Leight. Lich. Brit. Exs. 260) is beautifully represented in Grev. Scott, Crypt. t. 219, and its microscopic details in Tulasne's Mém. Lich. tab. 9. figs. 1–6.

Mount's Bay, Cornwall (*J. Ralfs, Esq.*!) may be recorded as an additional habitat.

PLATE IV. fig. 21. Sporidium, magn. 1200 times linear.

Lichina confinis, Ag. This Lichen is also beautifully given in Grev. Scott, Crypt. t. 221, and in Tulasne, *l. c.* tab. 10. figs. 12–18.

Mount's Bay, Cornwall (*J. Ralfs, Esq.*!), and Black Stones, Conway Bay, Caernarvonshire! June 1856, are additional habitats.

PLATE IV. fig. 22. Sporidium, magn. 1200 times linear.

Pterygium centrifugum, Nyl. Syn. 92; Arnold, Lich. Juras. Exs. 159, may probably be found on our limestone-rocks.

The scales on the Plate are the $\frac{1}{1000}$th of an inch, magn. 330, 660, and 1200 times linear.

III.—*On the Gland of the Phyllodium of* Acacia magnifica.

By the Rev. W. A. LEIGHTON, B.A., F.B.S.E.

MY attention has been attracted to a plant of *Acacia magnifica* when in blossom. On the upper edge of the vertical phyllodia (for the plant has no true leaves) subtending the showy spikes of yellow flowers, which proceed from their axils, appeared a pellucid drop of liquid, varying in size from that of a large pin's head