A QUARTERLY RECORD OP

CRYPTOGAMIC BOTANY

AND ITS LITERATURE.

EDITED BY M. C. COOKE, M.A.,

of "Handbook *of British Fimgi," "**Fungi,** their usesj'*
£c, " *Rust, Smut, Mildew, and Mould,*[1]' *$c, §c.*

VOL. IV.

1875-6.

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WILLIAMS AND NORGATE,

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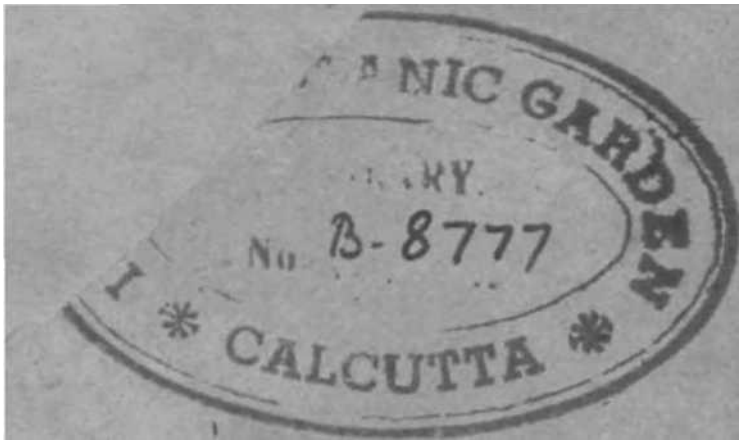

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No. 29.] ^ ^./**[September, 1875.**

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Grevillea,

A QTJABTEBLY BECOED OF CEYPTOGAMIC BOTANY AND ITS LITERATURE.

NOTICES OF NOBTH AMERICAN FUNGI.

By the REV. M. J. BERKELEY, **M.A., F.L.S.**

{Continued from Vol. iii.,

* **Helotium (CalyceUa) citxinum.** *FT.*—On dead wood. New England, Oakes.

Sporidia -0004 long.

* **Helotium (Calycella)** pallescens. *Fr.*—On dead wood.

Rhode Island, Bennett. No. 1868.

* Helotium (CalyceUa) fenugineum. *Schmin.*—On dead wood. Boston, Murray. No, 6239.

■, 751. Helotium (Calcycella) monticola. *Ii.*—Congestum pallido I fulvum obovatum; disco piano j sporidiis biserialibus subfusi-

Ifonnibns. On dead wood. Mountains of Car. Sup. No. 470. Crowded, pale tawny, obovato ; disc plane; sporidia biseriate, subfttsiibmi. 7531 Helotium (CalyceUa) aglasosporum. *B.*—Corneum irrpgo-/ lare; lmnenio pabrinatoj aseis linearibus; sporidiis oblongis currnlia utrinque hyalink. Oi,i dead wood.

H,'orn-browu, in-cgxilar; hymenium pulvinate; asci linear ; Bporifdia oblong, curved, hyaline at either end. Sporidia -0013-.000* long.

* Helotium- (CalyceUa) hexbarum. *Fr.*—On fallen branches in moiyt places. B«ntee Rirer. No. 1579.

■-. Psilopezia nummulaxia. &— "Hoot. Lond. Journ.," 1847^ p. 3-25.

A On rotting logs or on the ground. Car. Inf. No. 2959, 2989. P ylvanin, iMiehener. No. 8580. Ohio, Lea.

BJ&aidia -0008 long, binucloate.

^| 75fi. Psilopezia flavida. *B. fy O.*—Congests flavida laris irregularis flexctosa ; margine deinum elevato; sporidiis oblongis. On wood of *Quercus alba.* Alabair ., PeteTS. No. 5233.

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About £ inch across, dirty yellow, somewhat confluent, flexuous; asci linear; sporidia oblong, *0006 long, about half as much wide.

* **Rhizina undulata.** *Fr.*—On the ground, in pine woods, and on damp earth by the side of ditches. Car. Inf. No. 2962, 2963.

755. **Cordierites muscoides.** *B. $* C—Gregaria ramosa rufa apice pallida obtusa ; floccis adscentibus brevibus ornata. On damp boards. Pennsylvania, Michener. No. 4314. About two lines high, slightly branched, rufous pale and obtuse above, clothed with short hair, all tending upwards. Much **stouter than *C. coralloides.***

* **Patellaria applanata.** *B. $* C—Linn. Soc. Journ. Car. Inf. No. 2499. On *Cornvs suecica.* Penns., Michener. No. 4378.
Connecticut, C. Wright. No. 5637.

* **Patellaxia xhabaxbaxina.** *B.*—Rav. Fasc. v., No. 46. Oil
Cornus suecica. Alabama, Peters. No. 4000. On *Fagus sylva-*
tica. Car. Inf. Ravenel. No. 1734. On *Rubus.* Penns.,
Michener. No. 4361.

* **Patellaria discolor.** *Mont_* Car. Sup. No/164, 936. Car.
Inf. No. 2658 bis., 2488, 2978. On *Polygonum Pennsylvanicum.* No. 1167.

* **Patellaria atrata.** *Fr.*—Car. Inf. Ravenel. No. 1640,1445.
Virginian Mountains. No. 3350. New England, Russell.

* **Patellaria olivaceo-vixens.** *Schwein.*—Car. Sup. No. 444.
On oak.

* **Patellaria carpinea.** *B.—Pez. carpinea,* P. Ohio, Lea; on
Carpinus Americana. **Penns., Michener.**

* **Patellaria nigro-cinnabarina.** *SchwJ*—On *Liriodendron.* Car. Inf. No. 2257. _ ' .

756. **Patellaria atxo-fusca.** *B.$ C*— Orbicularis margine elevato atro-fusca; ascis clavatis ; sporidiis oblongis triseptatis.

On small twigs of *Viiis vulpina.* Car. Inf. No. 3210.

Small, with the habit of *P. atrata.*

Orbicular, black-brown, with an elevated margin, springing from a black thin stratum which surrounds the twigs. Asci clavate; sporidia uniseriate oblong, triseptate. No. 5953 is apparently the same in a young state.

757. **Patellaria stygia.** *B. $* C—Atra superficialis margine elevato ; sporidiis uniseptatis.

On dead wood. New Jersey. No. 4590. Car. Inf. No. 391\1. Loston, Sprague. No. 6234.

This also has the habit of *P. atrata*.

Black, superficial, orbicular, with a raised margin ; sporidia oblong, slightly attenuated at either end, uniseptate, -0005 long.i

758. **Sphinctrina microscopica.** *B. $* C—Curta capitulo subglboso ; ascis linearibus ; sporidiis uniseriatis oblongis. ■

On dead twigs of *Morus multicaulis.* Car. Inf. No. 2712.

Very minute ; stem rather thick, nearly equal; head subglobose; asci linear, sporidia in a single row, oblong, 0003 long, about ^ as much broad. Occasionally the stem is divided at the base.

759. Sphinctrina gummae. *B.&Mont.*—Brevis turbinata; stipite sursum incrassato ; ascis subclavatis; sj)oris globosis ; paraphy-sibus linearibus granuliferis.

On gum of *Cerasus serotina.* Car. Inf. No. 2167.

Stem short, incrassated upwards ; head turbinate ; asci slightly clavate ; sporidia uniseriatc globose; paraphyses linear, granular within. In *Spinctrina turbinata* the sporidia are elliptic and larger.

* Tympanis fraxini. *Sciwvcin.* — Virginian Mountains. No. 3366, 3368.

* Tympanis conspersa. *Fr.* — On *Prunus.* New England, Sprague. No. 5815. Pennsylvania, Michcncr. No. 5143. On peach. Sartwell. No. 3071.

* **Tympanis fasciculata.** *Schwein.* — On *Viburnum dentatum.* Pennsylvania, Michener. No. 4344, 3557.

760. Tympanis Ravenelii. *B.*—Sparsa vel fasciculata ; cupulis breviter pedicellatis marginatis, disco cinereo; sporidiis biconicis commissura medioque constrictis.

On branches of *Carpinus.* Car. Inf. No. 2018, 1816. Rave-nel. No. 1676, 1816. On *1lev prinoides.* Alabama, Peters. No. 3989.

Scattered or fasciculate, cups strongly marginate, shortly pedicellate, disc cinereous; sporidia biconical, the divisions and commissure constricted, with occasionally a globular body at the commissure, 0013--0015; paraphyses crowned with narrow obovate conidia.

*** Tympanis turbinata.** *Schwein.* — On *Viburnum prunifolium.* Penns., Michener. Asci obtuse; sporidia multitudinous.

7G1. Tympanis gyrosa. *B. 8f C.*—Fasciculata, cupulis arete com-pressis gyrosis.

On fallen branches. Virginian Mountains.* No. 3338.

On dead apple branches. New England, Russell. No. 5940.

Fasciculate; cups closely compressed, forming a gyrose patch.

The species is certainly distinct, but I have not seen any fruit.

762. Tympanis rhabdospora. *B. $ C.*—Fasciculata, cupulis ele-yati»3 flexuosis, acute marginatis ; sporidiis filiforrnibus. Qn *Acer.* New England, Sprague. No. 5831. fasciculate, cups crowded, elevated, flexuous, acutely margined; jJia filiform, nearly straight.

Tympanis stictica. *JB. fy C.*—Punctiformis, cupulis concavis ^e elevato; ascis clavatis ; sporidiis fusiformibus curvatis q

1(5rinucleatis.

O^i *Salix Babylonica*.

Minute, punctiform, cup cpncave, with an elevated margin; asci clavate, sporidia fusiform, slightly curved, with four nuclei. No. 4318, 4325. On *Prinus verticillata*. Pennsylvania, Michener. May be the same, but I have seen no fruit, and the same may be said of No. 5837. Maine, Morse, sent out as *Tympanis Morsel*. No. 3514. On *Querciis tinctoria*. Pennsylvania, Michener, seems distinct, but there is no fruit. No. 5845, New England, Murray, and 5869, Eussell, are the same; also No. 175, Car. Sup. on vine.

* **Cenangium cxaterium.** *Fr.* — On rotten sticks, or on the ground. Car. Sup. No. 228. Ohio, Lea. Kentucky. Arctic America, Drummond.

* **Cenangium cexasi.** *Fr.*—New England, Murray. No. 5443. Vermont, No. 5867. Pennsylvania, Michener. No. 4350,4352, 5375.

* **Cenangium pxunastri.** *FT.*—Mountains of New York. No. 4508. Maine. No. 5688. Pennsylvania, Michener. No. 3560. No. 130 on cherry. 134 on *Prunus Americana*. No. 208 on peach. Car. Sup. the *Spha&ria rigida*, DC. form.

* **Cenangium ferruginosum.** *Fr.* — On *Pinus strobus.* New England, Sprague.' On *Abies balsamifera.* Pennsylvania, Michener. No. 4390.

* **Cenangium pinastri.** JF>.—Canada, Poe. No. 6138. French, Broad. Car. Sup. Ravenel. No. 1523.

* **Cenangium cephalanthi,** *Schwein.*—On *Cephalanthus occidentalis.* Car. Inf. No. 5024. Alabama, Peters. No. 5201.

* **Cenangium txiangulaxe,** *Schwein.*—Upper Canada. No. 330. Dr. Maclagan. Car. Inf. No. 448. Ravenel. No. 1581. On *Quercus alba.* Pennsylvania, Michener. Sporidia filiform.

* **Cenangium tuvgidum.** *Fr.*—On oak limbs. Car. Inf. Rave nel. No. 1393. Car. Sup. No. 833.

Sporidia biseriate, fusiform, straight, with about four nuclei.

764. **Cenangium fulvo-tingens.** *B. $ C.*—Fasciculatum, fulvo-tingcns; cupulis tenuibus extus venosis subtiliter pulverulintis compressis ; sporidiis oblongis curvulis.

On dry wood, which it stains of a bright tawny. Pennsylvania, Michener. No. 5127.

Fasciculated, cups thin externally brownish, minutely pulverulent, veined, crowded, compressed; sporidia oblong, slightly cuirved, almost sausage-shaped, '00025 inch long. ^

7G5. **Cenangium pithyum.** *B. Sf C.*—Erumpens, margine obuiso infiexo subtiliter pulverulento; sporidiis lineari-oblongis curvatis 4-septatis.

On *Abies*. New England, Sprague. No. 5827.

Erumpent; margin obtuse, strongly inflected, minutely pulverulent, brownish; sporidia linear-oblong, strongly curved with four septa, *002 long.

766. Cenangium magnolia. ***B. 8f C.*****—Caespitosum apertum marglnatum nigrum; ascis amplis, sporidiis maguis allantoideis.**

On *Magnolia glauca.* Car. Inf. No. 2G68. On *Lawns.* Alabama, Beaumont. No. 5108.

Ctespitose ; disc open, rnarginate, black; asci ample, sporidia sausage-shaped, -OO-'OOIS inch long, about half as much wide.

This was first sent out as *C. magnolia,* and I do not like to alter the name though it occurs on another genus.

767. Cenangium concinnum. ***B, $ C.*****—Cupulis sessilibus subtiliter pulverulentis marginatis ; disco piano nigro ; sporidiis biscrialibus oblongis triscptatis.**

On *Quet-cus falcata.* Car. Inf. No. 3828, 6172. On *Laurus benzoin.* Car. Inf. No. 2295. On *Laurus sassafras.* Alabama, Peters. * No. 5238.

Cups flat, with a strong brownish margin ; disc black; sporidia biseriate; sporidia oblong, triseptate, '0006 Jong. No. 3828 has rather smaller sporidia, but is scarcely distinct.

* **Cenangium apertum.** ***Sch?vein.*****—On *Hydrangea.* Pennsyl**
vania, Michener.

* **Cenangium andromeda.** *ScJuvcin.*—On *Andromeda arborea.*
Car. Sup. No. 57,314.

Sporidia slender, funiform or sigmoid, with many nuclei.

*** Cenangium spiraea.** *8chwein.—Qn Sjrircea opulifolia.* Car.
Sup. No. 446.

768. Cenangium leptospexmum. ***B. $ C.*** **— Fasciculatum minutum nitidum subglobosum disco pnnctiformi 5 sporidiis elongato-fusiformibus arcnatis pluri-nucleatis.**

On Abies. **Alabama, Peters. No. 5190.**

Fasciculate, minute, shining, subglobose ; disc small, almost punctiform; sporidia slender, fusiform, arched, with many globose nuclei.

*** Cenangium pulveraceum. i^\—Car. Sup. No. 4418.**

769. Cenangium Juglandis. ***B. Sf C*** **Csespitosurn globosum pruinosum apice nigrum serius omnino denudatnm.**
On *Juglans.* Mountains of Virginia. No. 3337. Caespitose, pruinose, naked above, globose, at length entirely black. Unfortunately without fruit.

770. Cenangium falias. ***B. Sf R.*****—Subglobosum sparsum dense viridi-pulveraceum,.**

On *Taxodium disticlmm.* Santee Canal. Car. Inf. Eavenel. No. 1417.

Globose, scattered, densely covered with apple-green powder.

A very pretty species, but I have seen no fruit.

*** Bulgaria saircoides. *Fr.*—On sticks and stumps. Pennsyl vania, Michener. No. 3535, 3590.**

*** Bulgaria inquinans. JV. — On oak. Car. Sup. No. 213,**

426. Georgia, Cotoosa Springs, Eavenel. No. 1733.
Massachusetts. No. 3393.

* **Bulgaria rafa.** *Schrvem.*—*On* fallen branches, Pennsylvania, Michcncr. No. 3613. New England, Sprague. No. 5328.

Sporidia elliptic, in a single row.

771. **Bulgaria decolorans.** *B. fy C.*—Alba demum cornei-color concava extus cum stipite venosa; ascis elongatis; sporidiis uni-seriatis oblongo-cymbaefoimibus.

On decayed oak-wood. Alabama, Peters. No. 5222.

At first white, then horn-coloured, externally venose, together with the short stem ; asci long; sporidia in a single row, oblongo-cymbaiform, *0013 long, about 1-5 as much wide.

* **Ascobolus fuxfuiraceus.** JP.—On dung. Car. Inf. No. 3850.

772. **Ascobolus major.** *B. <k C.* — Deplanatus margine eximio umbrino ; sporidiis ellipticis Iambus.

On dung. Car. Inf. No. 3794.

Depressed, with a prominent umber border, sporidia elliptic, even, '0011 long.

* **Ascobolus txifolii.** *Berrih.*—New England, Sprague. No. 5767. Car. Inf. On *Medicago saliva.* No. 6360. Pennsylvania, Michener. No. 4037.

Sporidia shortly clavate, '0003 inch long.'

Ascobolus conglomexatus. *Schmin.*— On dead wood. Car. *dt*^ Sup. No. 174. Car. Inf. Eavenel.

Sporidia oblong, narrow, uniseptate, f0003-*0004 long. 3on

* **Agyrium xufum.** *Fr.*—On dry fir wood. Alabama, T. M. Peters. No. 5193. onn.

773. **Agyxium Tuckermanii.** *B. fy* #.—Punttiforme convexum ^ave-rufum ; ascis brevibus clavatis sporidiis breviter subfusiformibus.

On bleached wood. White Mountains. New Hampshire, Tuck-erman. Kavenel. No. 1759. .iyo_

Minute,, punctiform, rufous; asci short, sporidia shortly subfusi-form, 0003 long.

7H. **Agyxium bxunneolum.** *B.^C.* — Convexum brunneolum, , ascis oblongis; sporidiis mlnoribus breviter fusiforniibus.

On roots of pine. Alabama, Beaumont. No. 5161. Wt,

Much larger than the last, with narrower oblong asci, and smaller ved, sporidia. The wood is not bleached.

* **Stictis ladiata.** P.—On oak. Car. Inf. No. 2262, 1479, ^uso 1678. Car. Sup. ,atis

On *Andromeda arborea.* No. 346.

* **Stictis sesleriae.** *Libert.*—At the base of dead grasses. Santee River. No. 1640. reru-

* **Stictis Hydrangeas.** *Sc7iwcin.* —Virginian Mountains. No. four

3352.

Scarcely different from *S. radiata.* Disc red, as in some British specimens.

*** Stictis pupula. *Fr.*—On *Syringa.* Car. Inf. No. 1068.**

On *Viburnum prunifolium* and *V. opulus.* No. 6005.

775. Stictis glaucoma. 2?. <fc *0.*—Liberata nigra, extns pruinosa ;
disco piano demnm elevato.

On *Rosa ruhiginosa.* Car. Sup. No. 905. On *Viburnum ojnrfus,* **No. 2382. On *Kerria japonica.* No. 3800.**

Bursting through the cuticle, but at length quite free, flat, black, externally pruinose.

776. Stictis stereicola. J5. # *C.*—Rufa, minuta, margine radiato.

On *Stereum frustulosum.* Pennsylvania, Michener.

Minute, gregarious, parasitic on the frustules of the *Stereum ;* margin radiated. I regret that I can give no better character of this curious species.

*** Stictis hysterina. *Fr.*—On wood of *Liriodendron.* Car. Sup. No. 159. Pennsylvania, Michener. No. 3974. Connecticut, C. Wright. No. 5634.**

Sporidia in No. 3974 elliptic or oblong elliptic, quadriseptate, •0005 long.

*** Stictis pazallela. *Fr.*—On dead wood. Car. Inf. No. 2289.**

*** Stictis versicolor. *Fr.*—On oak. Car. Inf. No. 2253. Ravenel. No. 1266. Var. *rufa.* Massachusetts, Russell. No. 5442.**

Sporidia sausage-shaped, exactly as figured by Corda under *Propolis versicolor.*

\ * Stictis caulincola. *Schwcin.* — Sporidia fusiform, at length triseptate, *0008 inch long.

*** Ziichenopsis sphaeroboloidea. *Schwcin.*—On *Carya.* Car. Sup. No. 745. Car. Inf. No. 2390. On *Syringa.* No. 2263. On oak. No. 2423. On peach. No. 2520.**

Asci very long; sporidia linear sigmoid, with 25 or more septa. [r]irhere is apparently some species of Ascomyces, No. 5468, from St, Lawrence.

*** Tuber maexosporum. *Vitt.*—Pennsylvania, Michener. No. 1333.**

. Sporidia -002 long, reticulated.

*** Phacidium pini- *Schm.*—Pennsylvania, Michener. IJb. 5157.**

v)n *Finns strobus.* New England, Sprague. No. 5411.

New
York, Sartwell. No. 2657.

*** Phacidium abietinum. JE00.—On fir leaves. Car. Inf. Ravenel.**

e' 777. Phacidium elegans. £.$C*t*—Punctiforme radiato-apertum; s'jporidiis clavatis fenestratis.

I On bractes and sheaths of living pines. Car. Inf. No. 3678.

[1] Minute dot-like, black, opening by two or three lobes from the c' jentre • sporidia clavate, with several horizontal and vertical septa, M pOl lo'ng. The sporidia in P. *pini* are filiform.

778. Phacidium simulatum. ***B. Sf C*****—Hysteriiforme; ascis clavatis, sporidiis obovatis binucleatis.**

On dead stems of *Clinopodium,* looking like an *Hysterium,* black; asci clavate ; spores obovate, binucleate, '0004 long.

*** Phacidium exasperans. *Schwein.*—On leaves of *Kalmia.* Pennsylvania, Michener. No. 4347.**

779. Phacidium elegantissimum. ***B. $*** **Cr-In maculas orbiculares albas nigrocinctas situm punctiforme angulatura.**

On leaves of holly. Alabama, Peters.

Seated on white orbicular black-margined spots, minute, angular. An extremely pretty species, but unfortunately I have found no fruit.

*** Phacidium dentatum.** ***Kzc*****—On leaves of *Quercus obtusifolia..* Car. Inf. Ravenel. No. 1629. On *Quercus nigra.* No. 4971.**
Texas, C. Wright. No. 3909.

***Eustegia magnolia.* Ravenel. No. 1356. Has no asci but long filiform stylospores.**

*** Rhytisma acerinum.** ***P.*****—Car. Inf. Ravenel. No. 632. On**
***Acer ruhrum.* Car. Inf. No. 2225.** \

* **Rhytisma solidaginis.** *Schwein.*—On *Solidago leptocepJiala.*
•
Louisiana. No. 2571. On *Sol. ccesia.* New York, Sartwell, >
Miss Murray. On *Aster gracilis.* New Jersey. No. 2778. No.
3460.

* **Rhytisma punctatum.** ***Fr.*****—On *Acer spicatum.* New York, Sartwell. No. 3450. Ohio.**

* **Rhytisma vitis.** ***Schwein.*****—-Car. Sup. No. 688.**

* **Rhytisma ilicincola.** ***Schrvein.*****—On *Ilex prinoides.* Car. Inf. No. 2255. Santee Canal, Ravenel. No. 1626.**

* **Rhytisma prim.** ***Schrvein.*****—On leaves of *Prinus.* Car. Inf.**
No. 2254.

Scarcely differs from the last.

* **Rhytisma Xlicis-Canadensis.** ***Scliwcin.*****—Canada, Poe.**

The same remark applies to this specimen.

* **Rhytisma Andromeda.** ***Fr.*****—Canada, Poe. No. 6159.**

*** Rhytisma vaccinii.** *Schwein.*—On *Vaccinium arhoreum.* Car.
Sup. No. 702. Ravenel. No. 493.

780. Rhytisma Cuxtisii. ***B. $ Rav.*****—Crassum elevatum nitidnm dentato-apertum disco aurantio; paraphysibus longis filiformibus Bursum curvatis, sporidiis biseriatis clavatis.**

On leaves of *Ilex opaca.* Car. Inf. 1054, 2045. Ravenel.

Rather thick, raised, shining, black, opening by triangular lacinise; disc orange; paraphyses long, slender, curved above ; sporidia biseriate, clavate, much attenuated downwards, hyaline.

*** Rhytisma maximum. .Fr.—On *Cornus.* Alabama, Peters.**

No. 4571.

781. **Rhytisma tostum.** *B. $ C.* — Tenue in maculam luteam
situm, gyrosum hie illic tantum fertile.

On leaves of *Quercus lancifolia.* Alabama, Beaumont.

Seated on yellow spots, thin, gyrose, only here and there producing fruit-bearing perithecia, which soon shell off. Undoubtedly distinct, but the specimens are imperfect.

782. **Rhytisma monogramme.** *B.* <£■ *O.—In* maculam brunneam nigro-marginatam situm ; peritheciis hysteriiformibus solitariis.

On leaves of *Vitis cestivalis.* Seated on brown spots, which have a black border, hysteriiform, perithecia solitary. A very singular species, of which further information is desirable.

783. **Rhytisma erythrosporam.** *B. 8f* C. — Minutum den t a toapertum, sporidiis subfusiformibus utrinque apiculatis salmoni-
coloribus.

On leaves of *Quercus virens.* California. Proc. Am. Ac. iv., p. 128.

Minute, opening with two or three laciniae; asci swollen ; spo-ridia -0013 long, salmon-coloured, subfusiform, apiculate at either extremity.

784. **Asterina orbicularis.** *B.* <fc <?.—In maculas orbiculares disposita; ascis obovatis; sporidiis oblongis obtusissimis curvatis uni septatis.

On leaves of *Ilex opaca.* Car. Inf. No. 2046, 2373. On *Prinus coriacea.* Car. Sup. No. 3443. Ravenel. No. 231.

Forming orbicular black spots, in which the substratum is either quite continuous or interrupted; asci short, obovate; sporidiaoblong, curved, very obtuse, uniseptate.

785. **Astexina decolozans.** *B.* <*t* C.— Maculis orbicularibus un-
dulatis ballatis ; peritheciis punctiformibus ; mycelio parco ; ascis brevibus; sporidiis uniseptatis.

On some unknown leaf. New Jersey. No. 4684. Spots orbicular, rufous, undulated and bullate; mycelium sparing, consisting of a few moniliform threads, and others which are inarticulate ; asci short, oblong; sporidia uniseptate, "0004 long.

[1] 786. **Asterina conglobata.** *B. 8f* O.—Peritheciis globosis con-g lomeratis ; ascis obovatis sporidiis breviter subfusiformibus uni-s leptatis.

On *Arbutus uva ursi.* No. 5865.

I Globose, minute, conglobated, seated on **a** few slender threads; a .sci obovate ; sporidia shortly subfusiform, uniseptate.

787. **Asterina diplodioides.** *B. 8f C.*—Maculis orbicularibus, my-ce VLio interrupto ; sporidiis oblongis obtusissimis uniseptatis fuscis. [1] On leaves of *Andromeda acuminata.* Alabama, Peters. No. **4^11.-**

Forming orbicular interrupted spots ; perithecia minute ; sporidia '0 }003 long, shortly oblong, obtuse at either end, brown, resembling

trjie spores of a *Diplodia.*

788. **Astezina melioloides.** *B. $• C*—Orbicularis parva ; peri-tlieciis depressis; sporidiis brevibus cymbseformibus uniseptatis. _ On leaves of *BaccJiaris halimifolia.* Car. Inf. Eavenel. No. 1355.

Forming little orbicular spots; .perithecia depressed, brown, rather rugulose ; crowded; asci short, clavate; sporidia shortly cymbseform, uniseptate.

* **Astexina pelliculosa.** *B.*—On *Prinus coriacea.* .Car. Sup. No. 3443.

789. **Astexina spuxca.** B. # *0.* — Peritheciis sparsis punctiformibus, floccis brevibus duobus velpluribus junctis articulatis radiantibus ornatis.

On leaves and stems *of.IIyptis radiata.* Car. Inf. No. 1670. Ravenel, 1856. Alabama, Beaumont. No. 4657.

Scattered, dot-like, surrounded by short articulated, submonili-fonn, radiating threads, which are joined together laterally in twos, sometimes forked at the apex.

790. **Astexina Wxightii.** *B. 8f C.* — Mycelio tenuissimo ; peri theciis granulseformibus fuscis floccis cirrhatis circumdatis; ascis clavatis brevibus.

Apparently on some smooth *Cucurbit.* Texas, C. Wright. No. 3880.

Mycelium very thin ; perithecia granular, crowded like little grains/ of gunpowder, surrounded by cirrhate threads; asci clavate, short;

791. **Astexina comata.** *B, # Rav.*—Sparsa major; mycelio obso - leto; floccis brunneis dense vestita. *

On leaves of *Magnolia glauca.* Alabama, Peters. No. 4562'.

Magnolia grandiflora. Santee Canal, Ravenel. No. 1819.

Scattered, without any visible mycelium, large for the genus , about ^ line broad, densely clothed with short brown hairs. Th«e specimens in either case are young and without fruit, but thta species is very distinct.

♦ **liophium mytilinum.** *Fr.*—On bark of *Laurus Caroliniensis.*\ Car. Inf. Ravenel. No. 1456.

* **Glonium stellatum.** *Muld.*—On pine trees near the ground. Car. Inf. No. 1414. Car. Sup. Ohio.

* **Labrella pomi.** *Mont.—On* apples. Rhode Island, Olney. , No. 2588.

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* **Hystexium pulicaxe.** P.—On dead wood and bark. Ex tremely **common, *p. angustatum.* On *Platanus.* Car. Inf. Rav.** No. 1429. 7. *lenticulare.* Car. Sup. No. 285. 759.

* **Hysterium elongatum.** *Wahl.*—On dead wood. Car. Sup No. 171, 184, 270, 442, 714, 882, 904.

792. **Hystexium depression,** *B.* $ C—Elongatum, granulato ragosum depressum ; rima angustissima; ascis clavatis; sporidiis cymbseformibus 5-septatis.

On dry exposed wood. Virginian Mountains. No. 3297.

Elongated, rough, "with minute granules depressed; disc extremely narrow; asci clavate ; sporidia cymbseform, with about five septa, sometimes abruptly bulging in the centre on the more convex side, *0016 long. Allied to the last, but the sporidia are very different.

*** Hysterium varium. *Grev.*—On dead wood. Car. Inf. No. 2087. Approaching *Lophium.***

*** Hysterium lineare. *Fr.*—On logs of *Taxodium.* Car. Inf. Ravenel. No. 1455. On dead wood. New England, Russell. -No. 5391, with *Patellaria atrata.* Car. Sup. On oak. No. 851.** On *Gleditschia.* No. 885.

I find in these specimens spindle-shaped sporidia, constricted strongly in the centre, multiseptate, 002-*0015 long.

*** Hysterium praelongum, *Schwein.*—On dead wood. Texas, C. Wright. No. 3894, 3916.**

Sporidia elliptic, probably resembling when mature those of *H. elongatum.*

793. Hysterium fusiger. *B. $ C.*—Elongatum flexuosum ; spori-diis fusiformibus quandoque curvatis multiseptatis.

On dead wood. New England, Sprague. No. 5830.

Elongated, flexuous, lying in various directions; sporidia fusiform, with about eight septa, sometimes strongly curved, '001 long. Resembling somewhat *H. tortile* and *graphicum*, but with different sporidia.

*** Hysterium rufulum. *Spreng.*—On *Rhus radicans.* Car. Sup. No. 720, 912.**

7[r]4. Hysterium hiascehs. *B. &C.*—Superficiale ellipticum, labris in' olutis lsevibus; disco aperto ; sporidiis ellipticis fenestratis.

On dry bark of *Quercus bicolor.* No. 5883. Car. Inf. No. 3416. On *Celtis occidentalis.* Car. Sup. No. 287 (specimens in bad condition).

Allied to the last with the sporidia of *H. elongatum.*

*** Hysterium fleaLuosum. *Schwein.*—On *Betula rubra, Acer** *rubrum, Vitis riparia, Comus sericea, Andromeda arborea,* &c. Car. **Sup. No. 1, 23, 63, 105, 109, 117, 316, 708, 796, 845. Car. Inf. No. 2343.**

*** Hysterium Fraxini. P.—On ash. Car. Sup. No. 727.**

*** Hysterium Smilacis. *Schwein.*—On twigs of *Smilax tamnoides.***

[1] Car. Sup; No. 93. 360.

795. Hysterium Cyrillae. *B.SfC.*—Elevatum, ellipticum opa^am, J«ve; sporidiis biseriatis magnis oblongis endochromate bipartite. On twigs of *Cyrilla.* Car. Inf. No. 2747. Scattered, elevated, opaque, elliptic, even; sporidia biseriate, -'oblong, -004 long; endochrome

divided into two portions, one of jjwhich is less than the other ; epispore thick.

* **Hystexium petiolaxe.** *A.* <fc 5.—On petioles of oak. Car. Sup. No. 272, 341, 349.

* **Hystexium Azaleae.** *Schrvein.*—On *Azalea nudiflora.* Penn sylvania, Michener.

* **Hystexium Rubi.** P.—On *Rubus.* Car. Inf. No. 2956.

* **Hystexium pinastxi.** *Schrad.*—On pine leaves. Car. Sup. No. 140. New England, Sprague. No. 5298. Ganada, Dr. Maclagan. No. 305.

* **Hystexium commune,** *Fr.*—Car. Sup. On *Sambvcus canadensis.* No. 4507 On various herbaceous plants. On *Sedum Telephium.* Car. Inf. No. 176, 4498. On *Eupatorium purpureum.* Car. Inf. No. 2957. Ptnnsylvania, Michener. No. 3520.

* **Hystexium culmigenum.** *Fr.*—On stems of grass. Penn sylvania, Michener. No. 5126.

* **Hystexium Vaccinii.** *Carm.*—~On *Vaccinium.* Car. Sup. No. **281.** On *Andromeda arborea.* No. 288. On *Andromeda paniculata.* Pennsylvania, Michener. No. 4090. On *Lyonia ligustrina.* Car. Inf. Ravenel. No. 1691.

* **Hystexium maculaxe.** *Fr.*—On leaves of *Lauras Caro-liniensis.* Car. Inf. Ravenel. No. 1774.

* **Hystexium foliicolum.** *Fr.*—On leaves of *Magnolia.* Ala bama, Beaumont. No. 5097.

796. **Hystexium chloxinum.** *B. $ C*—Cito liberatum elevatum. ellipticum primum chlorino-pruinosum, demum denudatum ; labris* sulcatis ; sporidiis biseriatis magnis oblongis hyalinis uniseptatisfe medio contractis.

On twigs of *Quercus aquatica.* Alabama, Beaumont. No. 4637.\? Soon liberated from the cuticle, elevated from the bark, often] narrowed at the base, elliptic, at first greenish from a fine powdery! coat, which soon wears oft; lips sulcate; disc greenish; sporidiaj in two rows, oblong, uniseptate, constricted in the middle, "003 long; the endochrome has frequently a little emargination.

797. **Hystexium vaxiegatum.** *B. $ C*—Elongatum elevatum acu-tum ; rima conspicua ; sporidiis filiformibus.

On twigs of *Andromeda acuminata* Car. Sup. No. 447. On *Andromeda arborea.* No. 288. On *Andromeda coriacea.* Car. **Inf^'** No. 2449. On *Andromeda nitida.* No. 634.

I cannot distinguish Ravenel, No. 1743> on *Aralea spinosa.*

798. **Hystexium xufllabxum.** *B.* <$• C.—Ellipticum ohtusum e' macula pallida oriundum labiis runs ; ascis clavatis; sporidiis[1], breviter fusiformibus hyalinis.

On twigs of *Acer striatum.* Car. Inf. No. 341.

Obtuse, elliptic, growing on a pallid spot, lip rufous; asci clavate; sporidia shortly fusiform, hyaline, -0006 long. Sporidia very different from those of neighbouring species.

799. **Hystexium Petersii.** *B. $ G*—Cuticula conditum ellipticuni elongatumve flexuosum sporidiis filiformibus.

On cedar. Alabama, Peters. No. 4016.

Covered by the cuticle, elliptic, or elongated and flexuous; sporidia filiform. This does not grow on a pallid spot.

* **Cordiceps ophioglossoides.** i^r.—New England, Sprague. No. 5276.

* **Cordiceps capitata.** *Fr.*—On *Elaphomyces variegatus.* Car. Inf. No. 2460. New England, Sprague. No. 3273. Alabama, Peters. No. 4828.

* **Cordiceps entomorrhiza.** *Fr.*—Car. Inf. No. 2613. Ravenel.

* **Cordiceps militaris.** *Fr.*—Car. Sup. No. 451. Alabama, Peters. No. 5245. A small variety.

* **Cordiceps Ravenelii.** *B. $ C. Journ. Linn. Soc. i.p.* 159, *tab.* 1.

On larva; of *Ancylonycha*. Car. Inf. No. 3080. Ravenel. No. 1272. Texas, C. Wright. No. 3155.

* **Cordiceps acicularis.** *Rau.%*-\. c. p. 158., tab. 1. fig 2.—On larva?. Car. Inf Ravenel. No. 1276.

* **Cordiceps stylophora.** *B. & Br.,* 1. c. p. 158, tab. 1, fig. 3.—On laivse in rotten logs. Car. Inf. No. 1325.

* **Cordiceps palustris.** *B. $ Br.t* 1. c. p. 159, tab. 1, fig. 5.—On larvse in moist putrid logs. Northampton Swamp, Ravenel. No. 718.

* **Cordiceps armeniaca.** *B. ds G,* 1. c p. 158, tab. l, fig. 1.—On birds' dung, probably on remains of insects. Car. Inf. No. 3774.

* **Claviceps purpurea.** *Tvl.*—On *Glyceria Jluitans.* Montreal, Dr. Maclagan. No. 543. *Spermodia Paspali,* Car. Sup. No. 465; and Ergot on *Tripsacum dactylodes,* No. 455. Has been observed in the barren state only.

* **Epichloe typhina.** *Tul.*—On living grasses. Santee River. No. 1630.

800. **Hypocrea Petersii.** *B. Sf C.*—Agariciformis ; stipite rugoso ; perithcciis peripheries; ascis linearibus ; sporidiis globosis.

Alabama, Peters. No. 5251.

At first sight this looks like an Agaric infested with some *Hypomyces,* but the fructification is exactly that of an *Hypocrea.*

Stem iiregular, dilated upwards, about an inch high; head orbicular, irregular, rufous; perithecia both on the under and upper sides ; sporidia globose in linear asci.

801. **Hypocrea tuberiformis.** J9. j- *Rav.*—Magna tuberiformis
mycelio radiato albo affixa.

On stems of *Ai~undinaria.* Car Inf. Ravenel. No. 1220.

Forming either a large mass | of an inch across, or two or three distinct subglobose individuals, fixed to the stem by **a** radia-. ting white rugose mycelium ; at first yellowish, then black.

* **Hypocrea rufa.** *IT.*—On moist decayed wood. Gar. Inf. No.

2953. On *Polyporus*. No. 2722. On Oak. Santee Canal, Ravenel. No.]935. Conidiiferous state. Car Inf. 1014, 1902, 2486. Car. Sup. 1780.

802. **Hypocrea Bichazdsoni.** *B. $* Jfo/tf.—Orbicularis rubra, plana vel corrugata sparsa vel congefeta; sporidiis ellipticis. *Tuber-**cularia pezizoidea,*** **Schwein.**

On poplar. Maine, Blake. New England, Russell. No. 5870. No. 4506, Mountains of New York, is a small variety.

Bright rufous-red, orbicular, scattered, plane, or crowded and corrugated ; asci clavate ; sporidia elliptic. First gathered in one of the Arctic Expeditions by Sir J. Richardson.

* **Hypocrea gelatinosa.** *Fr.*—Car. Inf. No. 1136, 1641. Ravenel. No. 1299. On *Carya.* No. 4242.-

803. **Hypocrea viridi-^rufa.** *B. $ Rav.*—Major subglobosa congesta viridi-rufa ; ostiolis impressis ; ascis linearibus ; sporidiis oblongis truncleatis.

On *Alnus serrulata*. Santee Canal. Car. Inf. Ravenel. No. 1846.

Subglobose, congested, or confluent, ,greenish-rufous; asci linear; sporidia oblong with two nuclei.

804. **Hypocrea Ravenelii.** B.—Pulvinata rugosa rubra ; ascis clavatis ; sporidiis biseriatis fusiformibus demum triseptatis.

OnOstrya Virginica, Acer rubrum. **Car. Inf. No. 1575. I**

Small, pulvinate, at first even, then rugose, bright rufous-red ; asci clavate; sporidia biseriate, fusiform, at length triseptate, •0015--0016 inch long. Allied to *H. Bichardsoni.*

\# **Hypoczea conUrta.** *B. $ C. Sphceria contovta,* Schwein.—

Car. Sup. No. 230, 364. On Cherry. No. 367. On Oak. No. 445. On *Liquidambar.* Ravenel. Car. Inf. No. 1366.

* **Hypocrea lenta.** *Fr.*—On *Nyssa.* No. 2190. On willow, Car. Inf. Ravenel. No. 970. On pine. No. 1375.

• **Hypocrea stereorum.** *B. & C. Sphceria Stereorum,* Schwein.—

On *Polypoms Curtlsii,* B. Car. Inf. No. 1079.

805. **Hypocrea chlorospora.** *B. &* C.—Parva atra viridi-pniinosa ; ostiolis prominulis ; ascis linearibus; sporidiis globosis viridibus.

Mountains of New York. No. 4466.

Small, pulvinate, black, with a greenish bloom; asci linear; sporidia globose, -00018 inch in diameter, green.

80G. **Hypocrea solenostoma.** *B. & Rav.*—Subglobosa pallide Tufa ostiolis elongatis cylindricis ; sporidiis globosis.

On decaying *Pachyma Cocos.* Car. Inf. No. 13.19. Santee Canal, Ravenel.

Subglobose, pale rufous, rather irregular ; ostiola cylindrical;

spores globose, "00016 inch in diameter.

807. **Hypocrea ochroleuca.** *B. $ Rav.*—Effusa ochroleuca in i* ycelio pallido sparsa.

On *Myrica cerifera*. Car. Inf. No. 1G35. Ravenel. No. 1382. Effused, thin, ochro-leucous, seated on a pale mycelium, with a barren border, often cracked when old.

* **Hypociea citrina.** Jr.—Car. **Inf.** No. 1448. On *Cyrilla.*
No. 2661. **Varying in** intensity of colour.

808. **Hypocrea polyp oroide** a. *BC.*~ Pcritheciis tomentosis liberis in crustam pallidam insidentibus.

On beech. Alabama, Peters. No. 6110.

Fawn-coloured; perithecia free, tomentose, with a nake **ostioltuu** seated on a pale crust, here and there elevated, which thin towards the margin. A very curious species.

809. **Hypocrea** armeniaca. *B. $ C.*—Effusa arrneniaca torn on tosa ; peritheciis superficialibus saturatioribus.

New England, **Sprague.** No. 6269.

Forming a thin tomentose apricot-coloured striatum, which when barren looks like ***Cortichan*** *ochroleucwn,* at length fertile, perithecia scattered, of a deeper tint. There is a form of this species which occurs on the naked soil. New England, Murray. No. 57H.

810. **Hypoexea paxasitans.** *B. $* **0.—**Minuta subelliptica prui-
nosa pallida; sporis majoribus globosis.

On *Ilydnum erinacevm.* No. 6190.

Minute, pallid, snbelliptic, sometimes winding round the teeth ; spores globose, rather large.

811. **Hypocrea subviridis.** *B. &* C—Effusa pallide viridis to*
mentosa in mycelium niveum insidcns.
On dead grass leaves. Car. Inf. No. 4955. Effused ; **perithecia** pale dull green, tomentose, crowded, seated on a white mycelium. A curious species.

* **Hypocrea atramentosa.** *B. $ C*— Journ. Linn. Soc, x., p. 377.
On leaves of *Andropogon.* Alabama, **Beaumont.** No. 4018

* **Hypomyces aurautius.** *P.*—Grev. tab. 78.
On ***Stereum.*** Car. Inf. No. 3286.
On **the** underside of oak logs. Ravenel, No. 1457.

* **Hypomyces asterophorus.** *Tul.* Carp, **in,, p, 54.—On** ***NyctaUs,***
Ravenel.

* **Hypomyces luteo-virens.** *Fr.*—On *Agaricus alutacevs.*
Car.
Inf. **BaveneL** No. 1105. Pennsylvania, Michener. No. 3971.
Var. *viridis.* New England, Sprague.

* **Hypomyoes lateritius.** *Ttd.$_f$* l. c. p. fi?.—New England, Murray.
No. 5366. Sprague, No. 5776. On *Lactarius Indigo.*

Car. Sup No. 6415.

* **Hypomyces tomentosus.** *Fr*, —On some Agaric. No. 6189.

812. **Hypomyces** tegillum, jB, *4 €.*—Mycelio pergamentaceo perithecciis ovatis rufis.

On pine. Car. Inf. No. 2606.

Perithecia brown, scattered over a continuous white mycelium like thin parchment.

*** Kypomyces ochxaceua. *Tul.,* 1. c. p. 41.—On decayed *Agarics.* Pennsylvania, Michener. No. 3606.**

*** Hypomyces xosellus. *A. $* &—Pennsylvania, Michener. No. 4383.**

*** Hypomyces asterophorus. *Tul.%* Carp, iii., p. 54.—Car. Inf. Ravenel. No. 1497.**

*** Nectxia episphaexia. *Fr.*—On *Ustulina.* Car. Tnf. No. 2952.**

*** Nectxia Peziza. *Fr.*—Car. Inf. No. 1907, 2508,2711, 3855.**
Boston, Murray. No. 6236.

*** Nectxia muscivora. *B.*—" Cooke Handb.," p. 786. Car. Inf. No. 1003.**

*** Nectxia ochxoleuca. *Schrcein.*—On *Morus multicaulis.* Car. Sup. No 144.**

*** Nectxia dematiosa. *Schwein.* On *Morns rubra.* Car. Sup.**
No. 289, 838.

Sporidia oblong, slightly curved, uniseptate, *00085-'00057 inch long, from an authentic specimen.

*** Nectxia cucnxbitula. *Fr.*—Car. Inf. On *Melia.* No. 1400.**
***OnPrunus.* No. 1418. Ravenel. On *Ficas.* No. 1810. On**
***Acer.* New England, Sprague. No. 5836.**

Sporidia sausage-shaped, innumerable, "000125 inch long.

In No. 4688 I find the minute sporidia within several long linear bodies, and endowed with molecular motion. This is the only specimen in which I have observed such a structure ; in all the others the sporidia are free.

*** Nectxia sanguine a. *Fr.*—Car. Inf. No. 2445. Ravenel.**
No. 1570. Virginian Mountains, on *Juglans.* No. 3321.

RaveneVs specimens are accompanied by *Atractium flammeum.*

*** Nectxia coccinea. *Fr.*—Car. Inf. No. 840.**
On *Moms*
***multicaulis.* No. 1085. On *Melia.* No. 1879. *OnPrunus.* No.**
1416. On *Magnolia glauca.* No. 2691. Ravenel.
On *Acer*
and *Quercus.* No. 1557, 1398. Car. Sup. On *Liriodendron.* No.
889. *B. parasitica.* No. 843. New England, Sprague. No. 5816.

813. Nectxia peponum. ***B. fy C.*****—Minima sparsa coccinea; spo-ridiis oblongis uniseptatis.**

On dead gourds. Car. Inf. No. 2230, 2384. On tomato. No. 2124. Santee Canal. Ravenel. No. 1786.

Very small, scarlet, scattered ; sporidia oblong, uniseptate. It looks ai first sight as if it were seated on a smooth white myce-lium, but it is only the external coat of the gourd.

Var. auxelia. Sporidia simple. Car. Inf. No. 1393. It is possible that this may be merely the same thing in a younger state.

THE RESTING-SPORES OF THE POTATO DISEASE.

By W. G. SMITH, F.L.S.

The potate disease in this country is rarely seen before the month of July, but this year I received some infected leaves for examination from the editors of the " Journal of Horticulture" at the beginning of June, and my reply to the correspondent was printed on June 10. The leaves were badly diseased, and I detected the Peronospora in very small quantities here and there, emerging from the breathing pores. This was a week or ten days before Mr. Berkeley brought the matter before the Scientific Committee of the Royal Horticultural Society, and when I heard Mr. Berkeley's remarks about the Protomyces, I immediately accused myself of great carelessness in possibly overlooking it; but I was equally certain of the presence of the Peronospora in the specimens I examined.

On receiving authentic specimens of diseased plants from Mr. Barron, of Chiswick, the brown spots on the potato leaves at once reminded me of the figures of some species of Protomyces, and the dimensions agreed tolerably well with some described plants of that genus, but the spots, when seen under a high power, appeared very unlike any fungus, and they were very sparingly mixed with other bodies much smaller in diameter, and with a greater external resemblance to true fungus spores. These latter spore-like bodies were of two sizes—one transparent and of exactly the same size as the cells of the leaf (and therefore very easily overlooked), and the other dark, reticulated, and much smaller. A few mycelial threads might be seen winding amongst the cellular tissue, and these threads led me to the conclusion that the thickened and discoloured spots *iyere* caused by the corrosive action of the mycelium, in the same \Vay as Peach, Almond, Walnut, and other leaves are thickened, ti-listered, and discoloured by the spawn of the Ascomyces, as illustrated at the last meeting of the Society. i My opinion, therefore, was soon formed that the " new" potato dlisease (as it has been called) was no other than the old enemy in disguise, or, in other words, that it was the old *Peronospora infes-thns* in an unusual and excited condition. That climatic conditions jiad thrown the growth of this fungus forward and out of season ^as probable; but the idea that the pest would not at length attack P 11 and every sort of potato was to me most unreasonable, though t^ie more tender sorts might be the first to suffer. " Suspecting the two-sized small bodies before mentioned to be of tfpe nature of spores, and remembering my experiments during last a;Utumn with ketchup, in which I observed that the spores of the common mushroom might be boiled several times, and for lengthened p 3riods, without their collapsing or bursting, I thought I would try t(> set free the presumed spores of the potato leaves by macerating the foliage, steins, and tubers in cold water. This maceration

was necessary because the tissue of the diseased leaves was 60 opaque and corroded, and the, cell-walls were so thickened that it was difficult to distinguish the threads and suspected spores from the cellular tissue. I did not treat the leaves with boiling water, because I wished to keep the threads and spores alive.

From day to day I kept the diseased leaves and stems and tubers wet between pieces of very wet calico, in plates under glass, and I immediately noticed that the continued moisture greatly excited the growth of the mycclial threads ; this to me was quite unexpected, as I had merely wished to set the spore-like bodies free. So rapid was now the growth of this mycelium that after a week had elapsed some decayed parts of the lamina of the leaf were traversed in every direction by the spawn. Thinking the close observation of this mycelium in the now thoroughly rotten and decomposed leaves might end in some addition to our knowledge of Peronospora infestans, to which fungus I had no doubt from the beginning that the threads belonged, I kept it under close observation, and in about ten days the mycelium produced a tolerably abundant crop, especially in the abortive tubers of the two-sized bodies I had previously seen, and measured in the fresh leaves. The reason why these objects, which undoubtedly occur in and about the spots, are so extremely few in number in those positions is, I imagine, because they require a different set of conditions for their normal growth, and these conditions are found in abundant and continued moisture.

The larger of these bodies I am disposed to consider the
" oospore" of the potato fungus, and the smaller bodies I look upon as the " antheridia" of the same fungus, which are often terminal in position. The filaments of the latter are commonly much articulated, and sometimes more or less moniliform or neck lace-like. Both oospore and antheridinm are very similar in nature and size to those described as belonging to *Peronospora alsinearum.* and P. *umbelliferwniy* and this is another reason (beyond my seeing,; undoubted P. *infestans* on potato leaves at the beginning of June) why I am disposed to look upon these bodies as the oospore and antheridium of the potato fungus.

The larger bodies are at first transparent, thin, pale brown, furnished with a thick dark outer wall, and filled with granules ; at. length a number (usually three) of vacuities or nuclei appear. The smaller bodies are darker in colour, and the external coat is marked with a few reticulations, possibly owing to the collapsing of the outer wall. At present, I have been unable to detect any "fecundating tube (described as belonging to the antheridium of other species, of Peronospora), but I have observed the two bodies in contact in several instances. After fertilisation has taken place, the outer coat of the oospore enlarges, and appears to be cast off. Both antheridium and resting spore are so slightly articulated to the \ threads on which they are borne that they are detached by the slightest touch, but with a little care it is not really difficult to sec \

both bodies *in situ ;* and my observations lead me to think that ■^migration frequently takes places after both organs are quite free. _ itheridia and oospores are best seen in the wettest and most thoroughly decomposed portions of the tissue of the decomposing tuber, but they occur also in both the stem and leaf. I consider Mr. Alexander Dean's remark, as reported in " Gardeners' Chronicle" for June 19 last, p. 795, to have a distinct bearing on this point, where he says :—" In all cases where the seed tubers were cut they were quite rotten."

Before I referred to De Bary's measurements of similar organs in other species of Peronospora, I was disappointed with the results of my observations, and felt disposed to refer the bodies and threads in the potato leaves to Saprolegnia, but a glance at the figures which I shall shortly publish, and the similar figures copied from De Bary to the same scale, will show that if the bodies observed by me are Saprolegnia-like, the oospores and antheridia figured by De Bary show an exactly similar alliance. Still, as the Sapro-legnieaB are at present defined, I am by no means inclined to describe the bodies observed by me as really belonging to that tribe of plants.

The Saprolegniese have the habit of moulds and the fructification of Algce, and they live on organic matter, animal and vegetable, in a state of putrefaction in water. One of the best known of these plants is *Botrytis Bassiana,* the parasite which causes the disease of silkworms. Now the genus Botrytis amongst fungi is almost >r quite the same with Peronospora, to which the Potato disease jelongs ; and I consider it a strong argument in favour of my >aprolegnia-like bodies being the oospores and antheridia of the *eronospora when such an authority as Mr. Berkeley (" Micro-graphic Dictionary," p. 6) considers one of the Saprolegnieae (Achlya) " may be an aquatic form of Botrytis Bassiana"—the silkworm disease.

The common fungus which attacks flies (so frequently seen on our window-panes in autumn), *Sporendonema muscce,* Fr., is said -to be a terrestrial condition of *Saprolegnia fer ax* $_{y}$ Kutz., which latter only grows in water; and if a fly infected with the fungus *)oe* submerged the growth of the Saprolegnia is the result. It would IQOW seem to be somewhat the same with the potato when diseased, in the fact that when submerged a second form of fruit is produced.

Between the two moulds, Botrytis and Peronospora, there is little $_{o}$r no difference ; the characters of Corda, founded upon the continuous or articulate filaments, cannot be relied upon, and even Do]3ary himself figures *P. infestans* with articulate filaments, like a true Bot'rytis. The intimate connection, however, between the ^aprolegniese and some moulds cannot be denied, as the instances $_{a)}$bove cited clearly show; and I am therefore disposed to think t hat the fungus which produces the potato disease is aquatic in one g'.tage of its existence, and in that stage the resting spores are formed.

Reference should here be made to the bodies found germinating in the intercellular passages of spent potatos by Dr. Montague (Artotrogus), and referred by Mr. Berkeley to the Sepedoniei. Ever since Mr. Berkeley first saw these bodies be has bad an unswerving faith in **the** probability of their being the secondary form of fruit of *Peronospora **infeetcms,*** but unfortunately, as far as I know, no One has ever found a specimen of Artotrogus since Montagne.

The question may, **therefore,** be naturally asked, in conclusion ■—How does Artotrogus agree with **the presumed** resting spores here figured and described? Ahd **baa** Mr. **Berkeley** been right or wrong in clinging so **tenaciously** tolas first idea? Fortunately for investigation **of** tin? potato disease (which can never be cured

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till it is understood), Mr, Berkeley has given in the "Journal of the Royal **Horticultural** Society " the number of diameters his figures are magnified to, and I **have** here further enlarged those figures so as to correspond in scale with my own drawings, which ■ latter are sketched **with** a camera **lucida.** It will be seen **that they** are the same with each other both in size and habit, with the exception of **the** processes on **the** mature spore of Artotrogus—**which** processes may possibly be mere inyeelial threads,- or due to the collapsing of the inflated cpispore. The reason these resting-sporcs have evaded previous search is that no one has thought **of finding** them amongst leaves which **had** been **macerated** for a long period in **waert.** There is, however, nothing unreasonable **in** fruit being perfected in **water or *very*** damp places, as it is common in the **Saprolegnieffi** and **amongst** Alga; in general. To sum **up,** there are **four reasons** why **the** bodies here described belong to **the** olU potato **disease**:—

1. Because they are found associated with the Peronospora and upon the potato plant itself.

2. Because they **agree** in size and character with the knowr. resting-spores of other species of Peronospora.

3. Because some other moulds are aquatic in one stage of their existence.

4. Because they agree in size with Artotrogus.

I will only say in conclusion **that** it **affords** me great **pleasure** to lay-these **additional notes on the potato disease** before **the** Sod* which thirty years ago **published** Mr. Berkeley's original and excellent memoir on the same **subject.—*Gardener's* *Chronicle,*** July 1CL 1875.

N.B.—Mr. W. G. Smith has also published in the succeeding? numbers of the same **Journal,** July 17th and July 24th, further) particulars and details of this subject **with** illustrations, to which we must refer our **readers,** as confirming and extending the ob.-rations above recorded.—ED. *Grev,*

NOVA ASCOMYCETUM

GENERA. *By* P. A. SACCARDO.

I. **Fracchiaea.** Sacc/Myc. Ven. 115, tab. xii. f. 3—7.

Perit ?ia carbonacea, aggregata, raro subsparsa, erumpentia, v., cortice lapso, superficial a, macula stroina'tica nigricante insiden-tia, orst(brevissimo dcnique umbilicato. Asci polyspori, para-physibus nullis. Sporidia valsea, *i.e.,* cylindracea utrinque rotun-diita, curvula, hyalina. Spermatia, in peritheciis ascophoris juveni-libus, minima, cylindracea, curvula, hyalina.

Species: *Fmcchiasa Jieterogenea,* Sacc, 1. c. et Mycoth. Ven. I., No. 88.

Obs. Genus peraffine *Coelosphcerice,* Sacc. (=?= Nitschkias Otth.), a quo inprimis ascis polysporis rccedit.

II. **Thyridaria.** Saco. Mycoth. Ven. II., No. 170.

Perithecia carbonacea, aggregata, raro subsparsa, crusta stroma-tica nigricante subcorticali insidentia et cum ea in acervulos sub-valseos connexa, tecta, dein saepe erumpenti-liberata. Asci octospori paraphysibus copiosis obvallati. Sporidia oblongata, plurilocularia (non muriformia) fuliginea. Status pycnidicus ct micropycnidicus cogniti.

Species: *Thyridaria incnistans,* Sacc. 1. c. *Cucurbitaria Brous-sonetice,* Sacc. Myc. Ven. 118, t. xii., f. 12-17.

Obs. Genus stromate manifestissimo instructum, *Thyridio* affine, a quo prsecipue sporidiis non muriformibus dignoscitur.

III. **Thyronectria.** Sacc.

Perithecia ceraceo-membranacea, contextu rubescente, subdia-phano nectriacea, in cortice nidulantia ibique in acervulos valseos aggregata, tecta v. tandem erumpentia, ostiolis papillatis, brevibus. Acci octospori, paraphysati. Sporidia oblonga, v. ovoidea, initio transverse et longitudinaliter pluriguttulata dein tenuiter muriformia, hyalina.

Species : *Thyronectria Patavina,* Sacc. (edenda).

Obs. Genus ob contextum perithecis et sporidia diaphana ad *Nectriam* v. *Calonectriam* vcrgens, ob stromata immersa, valsea et ob sporidia muriformia ad *Thyridium* , accedens, inter utrumque medium.

IV. **Passexinula.** Sacc.

Perithecia mcmbranaceo-mollia, pallida, in stromate v. in peri-theciis pyrenomycetum majorum (ex. gr. *Thyridii et Valsarice)* omnino immersa, nunc inordinate aggregata, nunc discreta, globosa, minuta; nucleo farcto candido ; ostiolis cylindraceis, plus minus alte cxertis, incurvis, albidis. Asci octospori, paraphysati. Sporidia oblonga v. ovoidea, 1-septata et ob guttas duas septo utrinque appositas simulate 8-septata, dilute fuliginea.

Species: *Passerinula Candida,* Sacc (edenda).

Obs. Genus, Nectriaceis subaffine, egregio jnycologo T. Pas-serini in Parmensi Universitate Botanices Professori dicatum ; quod

Passerinia vocare non oportet ex eo quod jam extat minium affine nomen Passerina.

Y. Phomatospoxa. Sacc.

Perithecia membranacea, discreta, minuta, tecta, v. erumpentia, ostiolo papillato, brevi. Asci cylindraceo-filiformes, aparaphy-sati, octospori. Sporidia phomatoidea, p. e. oblonga, continua, 2-gattulata, hyalina. Status spermogonicus *Phomam* referens.

Species : 1. *Phomatospora Berkeley^* Sacc, Sphseria phoma-tospora *B. et Br.*, " Cooke Brit. Fung.," 884.

2. *Phomatospora ovalis* (Pass.) Sacc. Sphseria ovalis, Pass., in " Erb. Critt. Ital.," ser. ii., No. 642.

VI. Patinella. Sacc

Cupulse sessiles, patellatse, marginatae, totae atrse, ceraceo-lentse, duriusculse; excipulo minute prosenchymatico, fuligineo ; disco concaviusculo, v. subplano. Asci octospori, paraphysati. Sporidia ovoidea, continua, minuta, hyalina. Paraphyses filiformes apicc conidia sphseroidea, fusca, mox secedentia gerentes. Species: *Patinella hyalophcea,* Sacc. (edenda). *Obs.* Genus inter Discomycetes paraphysibus conidia fusca gerentibus sporidisque minutis hyalinis insigue, nee ulli mihi noto affine.

SPHAGNUM LABICINUM, &c.

Dr. Braithwaite, in continuation of his valuable papers on " Bog Mosses" in the " Monthly Microscopical Journal," has detailed the varieties of *Sphagnum, laricinum* as follows :— Yar. *fi* **teietiusculum.** Lindb.

Branches crowded, terete, usually incurved or more or less cir-cinate. Stem leaves large, oblong, obtuse, the apex somewhat fringed or toothed. Branch leaves short, very broad, concave. Marshy places in woods.

Sweden, Lapland, Finland, Dovrefjeld Mountains Norway, New Jersey.

Var. y **platyphyllum.** Lindb.

Branches short, rather obtuse, with imbricated leaves. Stem leaves lingulate, with distinct auricles composed of projecting hyaline cells. Branch leaves rounded-ovate, pointed, very broad and concave.

Marshy places in woods in subalpine districts. Sweden, Lapland, Finland, Norway, Estland, North Wales, New Jersey.

Var. S **cyclophyllum.** Lindb. *(Sph. obtusifolium* var. *fi tur-gidum.* Hook & Wils.)

Stems short, turgid, l-3in. long, quite simple or with one or more short solitary branches. Stem leaves very large, orbicular deeply concave aud cucullate, pale greenish white.

Moist peaty places in mountain districts.

Aland Islands, Shore of Loch Katrine, New Orleans, Alabama, New Jersey.

Dr. Braithwaite then intimates his intention to add descriptions of three natives of North America which have not yet been found in Europe, and commences with—

Sphagnum Pylaiei. *Bridel. CSullivant Icon. Muse, p.* 12, t. *6.J* Dioicous ? olive green, fuscous, or blackish; stem erect, undivided, slender, 2-4in. high with a single layer of small cortical cells, and a narrow reddish brown woody layer ; branches all solitary or in 3 at the lower part of the stem, short, terete, obtuse, arcuato-.curved, the cortical cells small, retort cells few, narrowly cylindric, not recurved at apex.

Stem leaves numerous, laxly imbricated, erect, ovatc-oblong, concave, rounded and minutely erose at apex, the hyaline cells fibrillose. Branch leaves laxly imbricated, very small, ovate, obtuse, the margin incurved in the upper third, entire at apex ; hyaline cells with strong annular fibres, and without pores, in section circular, separated both in front and back by the chlorophyll cells, which are very thick and obtusely trigonous. Peat bogs. .

Newfoundland, Table Rock, S. Carolina, New Hampshire, New York, New Jersey.

v Var. /3 **sedoides.** Lindb. *(Sph. sedoides* Bridel, Bry. Un. i., p. 750.

Stem procumbent at base 3-5in. high, simple or with a few short, scattered branches, fragile, flaccid, dull pale green, the upper part vinous red. Leaves large, very densely imbricated, oblong-ovate, concave, obtuse, entire, or eroso-denticulate, with a border of two rows of extremely narrow cells; hyaline cells elongated, with annular fibres, and very few minute pores. Branch leaves similar but smaller. Peat bogs.

Newfoundland, S. Carolina, New York.

Sphagnum Pilaiei and its variety have been regarded by most authors as doubtful species, partly because they have never been found in fruit; the structure of the leaves and stem is, however, so distinct that there can be no hesitation in maintaining the right of *S. Pilaiei,* as the most highly developed form to the title of specific rank.—*Monthly Micro. Journ., June,* 1875.

Sphagnum Portoricense. *Hampe (Linn.* 1852, *p.* 359 J Dioicous ? in large soft tufts, pale fuscous below, pale glaucous green above. Stems 8-14 in. high, stout, simple or bipartite, firm, pale brown; cortical cells in 2-3 layers, containing spiral fibres, but few pores. Stem leaves auricled, erect pi\ deflexed, subquadrate-ovate, fringed round the entire margin, upper cells rhoTOboidal, lower elongated, all without fibres or pores.

Raruuli i-5 in a fascicle, 2-3 divergent, arcuate-patent, sub-

clavate-fusifonn, attenuated at base, the leaves julaceOusly imbricated; pendent branches more slender, lax. Cuticular cells spirally fibrillose with few pores, the transverse walls geniculate downwards into the adjacent cell, usually having a pore at the apex of the bend.

Leaves of the divergent branches small below and widely cordate or semicircular, becoming larger above, narrower at base, the median orbiculate-ovate, squamoso-scabrous at back of the strongly cucullate apex, very narrowly margined, all minutely fimbriate throughout, the fibrils of the fringe formed of the commissural walls of destroyed hyaline cells ; lower hyaline cells elongato-rhomboidal, upper rhombic, with numerons strong papillae internally on the wall combined with the chlorophyll cells, all fibrillose, with several large pores at the margin ; chlorophyll cells triangular in section, interposed between the hyaline on the concave surface of leaf. Fruit unknown. Swamps in mountain districts. Porto Rico. New Jersey.

Sphagnum macxophyllum, *Bernh. (Brid. Bry. Univ. i. p.* 10). Dioicous, pale olive green, fuscescent below, when dry glossy and Binning. Stems 6-10 in. high, rather rigid, very fragile, fuscous , simple or dichotomous by innovation, with 2-3 layers of cortical cells. Branches crowded in a spinose capitulum 3-4 in a fascicle, uniform and similar, divergent, dependent, straight, subflabellate ; lax leaved, the cortical cells short, uniform, with few pores. Stem leaves minute, very broad at base, ovate-oblong, obtuse, entire, the hyaline cells rhomboid, without fibres, but with 1-3 central pores. Branch leaves rather rigid, subdistichous, small at base of branch, soon becoming elongated, narrowly lanceolate, and lanceolate-subulate, involute-concave, bordered by 1-2 rows of extremely narrow cells, apex somewhat truncate, with 7-8 teeth. Hyaline cells elongate, flexuose-fusiform, with 6-10 p res in a longitudinal median line ; free from fibres. Chlorophyll cells circular in section, separating the hyaline both in front and back.

Fruit in the upper fascicles or in the coma, divergent; perichaetial bracts 6-9 lax, oblong-ovate, uppermost convolute, truncate, and toothed at apex, the areolation resembling that of the branch leaves. Capsule small on a shortish slender peduncle; spores sulphur coloured. Male plant and prothallium unknown.

North America (near Philadelphia, in Louisiana, Alabama, **Mississippi, New Jersey).** ***Braithwaite, in Monthly Micro. Journ*** *Aug.*, 1875.

MYCOGRAPHIA.—An announcement is made on the cover of this Journal of the speedy issue of the first part of a new work containing coloured figures of Fungi, to be continued at intervals of about six months.

LICHENOLOGICAL MEMORABILIA, No. 8. *By the* BEV. W. A. LEJGHTON, B.A. Camb., F.L.S., F.B.S. Ed. ***On Lecidea trochodes,* (Tayl.), Leight.**

The aim and object of every student of natural productions in liis researches and investigations ought to be the eliciting and establishment of truth. Nevertheless, notwithstanding the utmost care and careful observation, errors will inadvertently occur. The detection of such errors, from whatever cause arising, only makes the truth shine more clearly and distinctly. _' The pointing out of ich errors ought not to be considered an invidious task; only -jt it be done in a courteous and gentlemanly manner. To do so in asneering and acrimonious spirit and way is derogatory from the dignity of science, and unworthy of a true son of science, •since it can only rebound unfavourably against himself.

Dr. Th. M. Fries, in his " Lichenographia Scandinavica," part 2, p. 531, under *Lecidea trochodes*$_{v}$ (TAYL.), LEIGHT., quotes as synonymous and identical the four following lichens, viz.:—

Rimularia limborina,'^{m}*Njl.* Flora, 1868, p. 346. Leight. Lich. PI., p. 406.

Lecidea inferior f. subgyrosa, Nyl. Not. Sallsk., p. F. et PI. F. Forh., xiii. p. 339.

Lecidea inconcinna, Nyl. Flora, 1872, p. 357.

Lecidea subgyratula, Nyl. Flora, 1873, p. 296.

with this observation :—" Insignis facillimeque determinata species, quam qui semel vidit, dein mox aguoscat. Vix igitur in-telligitur, cur eel. Nylander ultimis annis hanc saltern quatuor iis-demque diversissimis nominibus designaverit. Expressis igitur verbis declaratum volumus, *omnia* supra allata synonyma examine **niti speciminum *authenticorum."***

Dr. Fries further states that the peculiar structure of the apothe-cium upon which Dr. Nylander founds his genus *Rimularia* arises from the circumstance that the paraphyses becoming dead, sub-carbonaceous, and fuscous-black, especially at their apices, form a continuous or partial carbonaceous stratum over the epithecium or disk. But that the apothecia are really lecideine and similar to those observed in several species of the genera *Gyrophora* and *Lecidea*, the result of a similar deformation, and that an entire perithecium involving the hymenium is purely imaginary.

What *Lecidea inferior f. subgyrosa,* NYL., and *Lecidea incon-cinna,* NYL., may prove to be, I have no means of ascertaining, as I have never seen authentic specimens of those lichens. But I possess a fragment of the original specimen which Dr. Taylor collected on Carig Mountain, county Kerry (preserved in Herb, oorrer. at Kew), and which he published in his " Flora Hibernica," **p.^{1}259, as *Opegrapha saxigena var. trochodes.* This I showed in**

my " British Graphideae" (1854), p. 13, t. 5, f. 8, to be actually a Lecidea, which now bears the name of *L. trochodes,* and I have been informed on good authority that Dr. Nylander only knows the plant from this figure in my Monograph.

By the kindness of Mr. Crombie I have been permitted the microscopic examination of the unique specimen of *Rimularia limborina,* NYL., which he gathered on Craig Guie, Braemar, and which bears this name in Dr. Nylander's own handwriting. This **examination shows that *Lecidea trochodes* and *Rimularia limborina*** are perfectly identical both in external characters and internal structure and formation, except that the spores, in other respects identical are in the latter plant slightly larger, but still only so in a degree observable in most lichens, and not sufficiently dissimilar to separate the plants. As figures convey more distinct and adequate ideas than mere descriptions, I here add figures of the structure of the two plants and their spores (see plate 52, figures 1 and 2). From this it will be evident that *Rimularia limborina,* NYL., must be* erased from our British Lichen-Flora, and merged in *Lecidea* ***trochodes,*** **(TAYL.).**

Mr. Crombie has also supplied me with an authentic specimen of *Lecidea subgyratula,* NYL. This possesses umbonate apothecia, resulting most probably from the same deformation as stated by **Dr. Fries with regard to *L. trochodes.* But in *L. subgyratula,*** NYL., the spores are colourless, and only half the size of those of *L. trochodes* (see fig. 3) ; consequently this must be considered a good and distinct species, and that Dr. Fries is in error in regarding it as synonymous aad identical with *L. trochodes.*

EXPLANATION OF PLATE 52.

L. *trochodes.* (e) Section of apothecium. *(g)* Apothecium as seen from above (/) SporeB magn. 1200.

***Rimularia limborina.* (c) Section of apothecium. *(d)* Spores magn. 1200.**

***L. subgyratula, (a)* Section of apothecinm. (b) Spores magn. 1200.**

" ATLAS DER DIATOMACEENKUNDE."

The fourth and fifth parts of this work are now issued. Plate 13 contains a continuation of the *Pandurifomn navicula (Diploneis* group), viz., *N. didyma, N. gemma,* and its varieties, ***egena,* and *densestriata; N. prominula, N. futilis, N. gemmatula,* JV. *Kutzingii, N. diplosticta, N. splendida, N. bomboides,* JV\ *muscaeformis, N. entomon;*** besides these are several " critical forms'*' given for comparison ; these seem to unite several of the so-called species. Forty-nine figures are given ; making in all 154 figures of this group.

Plates 14 to 18 inclusive are devoted to the genus *Campy-lodiscus,* and contain 118 figures. About one-half of these are

given as distinct species (many of them new), the remainder represent " critical forms " and varieties.

Plates 19 and 20 contain the following forms of *Surirella,* viz., five varieties of *S. fastuosa, S. recedens, S. intercede?is, S. Collare, S. sentis*—a very fine and remarkable form the ridges of the cana-liculi are distinctly spinous. *S.Jausta* (the sp. name of *australip,* PL iv., fig. 20, to be deleted) ; this species is probably only a variety of *S. lata. S. deflexa,* distinguished by the sigmoid outline of the median space; *S. lepida* resembles *S. striatula, S. anfractuosa, S. arabica, S. Baldjikii.* The above forms belong to the fastuosa type. *S. Griindleri*—this, the author thinks may be only a variety of *S. pulchra, S. Febigerii, S. inducta,* and *S. Kurzii.*

In the five parts now issued we find 64 figures of *Surirella;* 19 of these represent forms of *S. fastuosa.* I am inclined to think that all forms with a striated border to the median space should be considered as merely variations (not varieties) of *S. fastuosa.* It is, perhaps, open to doubt whether it is desirable to figure so many forms exhibiting only the minutest differences. If this plan is carried out, this work will contain at least 30,000 figures. The following is a list of the genera already published, with the number ■ of figures illustrating them :—

Actinoptychus - -	26
Campylodiscus -	- 123 (not completed).
Cocconema - -	35
Cymbella -	79
Encyonema - - -	34
Navicula -	382 (not completed).
Surirella - - -	64 (not completed).

Professor H. L. Smith's list of genera contains about 400 names; allowing for synonyms, &c, we may fairly estimate the number at 300. As the twelve monthly parts represent one-sixth of the entire work, and as the number of figures in the six parts will probably not exceed 1000, the " Atlas,'[1] when complete, will contain more than 6,000 figures. It must, however, be remembered that the author states in his Prospectus that only those forms which are subject to great variation will be treated in this exhaustive manner. All the figures in the parts just published are remarkably accurate representations of the actual forms.

Part 5 contains a circular from the author, in which he alludes to the corrected explanatory tables which are to take the place of those now given. To enable him to do this with the accuracy he desires he most respectfully requests all who can afford him assistance in the form of well-founded criticisms, or the correction of any errors in nomenclature, will have the kindness to do so. In conclusion, he remarks, " I venture to say that I make this

Tequest in the names also of those who hope and expect that the publication of my ' Atlas' will greatly advance the knowledge of the Diatomacese, and their number is, I am happy to say, no small one."

F. KITTON, Norwich.

ON THE FRUCTIFICATION OF EHYTISMA MAXIMUM, *Fries.*

The polymorphism of fungi is one of the most interesting and important subjects the mycologist has to study, bearing as it does, not only upon the reproduction, but also,now-a-days, upon the classification of these organisms. Personally, we are inclined to think too much use is made by some mycolographers of the secondary forms of fructification, in their endeavours to find characters for thedifferentiation of genera, but this is far too extensive a subject for discussion here.

The following observations upon the fructification of *Rhytisma maximum, Fr.,* may be interesting, as the plant itself does not seem to be one of very common occxrence in this country ; they have been made upon specimens, om.thered at various seasons, which grew parasitically on some y£. lg willows in a clay pit near King's Lynn.

We believe that Sowerb c* *Sphceria aurea, U* 356, and Grcville's *Cryptomyces wauchii, t.* 20G, represent this plant, the former depicting it in its earlier conditions, the latter representing the ascigerous state, for according to our observations the golden yellow border, though not always absent, is far less marked in the ascigerous than in the non-abcigerous plant.

Usually, however, the first manifestation of the parasite consists in a yellow discoloration of the outer bark of some of the younger branches. Frequently these discolbrations are elongated in form, but whether so or not, in their centre are soon observable one or more black spots or patches, varying in size from a line or less to several inches in length. Repeated examinations of the fungus in this stage have failed to reveal any fructification whatever, and indeed very little structure at all. One of two things now happen, either the whole fungus, and more particularly the black central portions, increase in extent and thickness, without however manifesting any particular microscopic structure, remain for a longer or shorter period in a state of quiescence, and then developc asci and sporidia : presently more particularly to be described. Or, as not unfrequently happens, the blackened patches become distended by a semi-turbid fluid,.forming so many distinct blisters. The fluid which they contain owes its turbidity to a host of minute hyaline more or less oval speriuatia, averaging about -OOOlin. across, t. 63 fig. 6. We have never seen these bodies borne upon sterigmata as figured by Tulasne t. xvi., fig. 4. In this stage the plant is not

erumpent, the blackened patches and the cuticle being incorporate. Modifications in structure now take place which result in the development of asci beneath the blackened cuticle, in the vacuity which originally contained the spermatia ; when this is the case the blackened cuticle becomes adherent to, and forms an outer covering for, the ascigerous layer, giving the plant a black, shining, smooth surface. As the plant develops, the surface becomes more or less cracked in various directions, and the asci thus exposed.

Sometimes, however, the plant is truly erumpent, and from the first* of subcutaneous origin. It can readily be recognised as a thickening of the bark before the cuticle ruptures; in this state the yellow circumference is usually absent. In whatever manner it arises the ascigerous stratum, is always of a whitish colour, consisting of an assemblage of cylindrical octosporous asci t. 53, f., 8 and 4, containing ovate, very pale yellow sporidia, each of which when young is enveloped in a thin gelatinous vestment, and filled by a granular endochrome, with one or more large nuclei. They measure some #0G13 x '0003 in. upon an average. The paraphyses are abundant, filiform in outline, very slightly incrassated above, also containing granules, but we have never been able to see any distinctly articulate bodies, such as Tulasne, t. xvi, f. 6, represents. As the plant matures, it separates at the edges from the matrix, becomes revolute, and finally falls off, leaving a smooth cicatrix, formed by the exposure of the inner bark.

We also meet with reproductive bodies of two other kinds, namely a *Fusarium*$_{\gamma}$ which oozes out upon the surface of the *Rhytisma* in little roseate masses. These consist of curved spores, obscurely triseptate when mature, which were originally borne upon little threads, t. 53, ffg. 8 and 9.

The other bodies are spores having some resemblance to those belonging to the genus *Hendersonia*> dark brown in colour, from •0007 in. to '0009 in. long, usually triseptate, but occasionally with four transverse, and one longitudinal septa. They are developed from the interior of a somewhat indistinct perithecium, imbedded in the *Rhytisma,* aud originate as simple hyaline oblong spores, which acquire first one septum, then the other two, and at last the coloured ondochrome (t. 53, f. 5.) The perithecia have a mi ute shining black ostiolium, which is visible on the surface of the *Rhytisma*. We have only found the ascigerous fungus in spring and early summer, but the *Rhytisma* is to be met with at all seasons. Hence we conclude season has a good deal to do with the determining the exact mode of reproduction.' Frequently we have examined plants, and have found the white stroma, but no trace of spermatia or asci; it is under these conditions that the *Fusarium* spore are most likely to be met with, and later on the *Hendersonia* spores. This species of *Rhytisma* differs from its

• See Grev. t. 206, fig. 1, where a small branch is depicted distinctly representing this.

allies *R. salicinvm,* and *acerinum* in not maturing its asci during the winter as they do : but the stroma is developed in spring, and bears asci in early summer.

King's Lynn. CHARLES B. PLOWRIGHT.

PLATE 53.—Fig. 1. *Rhytisma,* nat. size. 2. Section of ditto 3. Aacus and sporidia X 500. 4. Sporidia X 500. 5. Pycnidia resembling *Hendersonia.* 6. Free conidia. 7. Conidia on sterigmata from Tulasne. 8. Fusiform stylo-pporea. 9. The same when free.

CLASSIFICATION OF PYRENOMYCETES.

Several advances have been made by Continental Mycologists of late years, towards a carpological classification of the Ascomy-cetes. Some objections have but recently been stated by the writer in the " Popular Science Review ;"•)" and the last volume of " Transactions of the Woolhope Club," includes some observations by Mr. C. E. Broome on the same subject. Professsor Saccardo's recently published scheme affords an opportunity for a further consideration of the basis of the classification proposed. Whatever may be the merits of Professor Saccardo's scheme, these must be subsidiary to the main question whether the basis is a sound one, and on this point we have already expressed a very decided opinion. The system adopted by Fries, with some minor modifications which experience has suggested, is based mainly on the vegetative system. External features, which can be determined often by the unaided eye, usually by means of a pocket lens, and only very rarely, and in peculiar instances, by resort to the low powers of a microscope, must commend itself, other conditions being equal, to the mycologist. It surely must be preferable to adopt a system by means of which an individual plant can, with little doubt or hesitation, be at once referred to its correct genus, leaving to microscopical examination its specific features, than to invert the order, and make microscopical examination essential to the determination of the genus, whilst external features are ignored. No one can doubt for a moment how much the determination of a collection of new plants is facilitated by the ability to group them at once in their proper genera. This is impossible with a carpological scheme, such as that proposed by Saccardo. Experience has proved that *Xylaria* is a natural and irreproachable genus, based on external features, on the clavate or branched stroma, and without any regard whatever to the character of the fruit. Because the sporidia are simple and coloured, it may be in all'known species, no attempt has been made to alter or split up the genus, but its principal feature is not carpological.

• Conspectus Genernm Pyrenomycetum Italicorum, systemate carp,ologico*diB-positornm, auctore. P. A. SACCARDO. f Pop. Sci. Eev., July, 1875, on " The Tendencies of Systematic Botany."

Hereafter it may be that a species with septate sporidia would have to be excluded if artificial are to give way to natural affinities, and secondary features to be promoted to the exclusion of primary. In like manner, *Dothidea* has always been regarded as a very natural though less perfectly characterized genus, but unfortunately the sporidia are more variable, and hence eight[1] genera in three groups, represent the hyaline simple spored, the hyaline uniseptate, and the coloured septate spored. If the proposed scheme is to be fully carried out, it must be considerably augmented, and there is no reason why, if pressed to its logical conclusions, nearly every species should not have a claim to be regarded as the type of a new genus. In Professor Saccardo's scheme there are seven typical groups—

1. Allantosporse.
2. Hyalosporse.
3. Pliajosporas.
4. Didymosporse.
5. Phragmosporae.
6. Scolicosporae.
7. Dictyosporse.

It is presumed that the same terms represent the same things in all cases, but that is not practically the case, for in *Perisporiacce* we find that *Hyalospoiw* are simple (page 1), in *Sphceriacece* they become 1-3 septate (page 5), in *Perisporiacece* globose, ovoid, or oblong ; in *Sphceriacece* ovoid, fusiform, or oblong; in *Ilypocreacece* ovoid-cylindrical, and sphaeroid in *Hysteriacece.* From the scheme it would appear that the above groups represent—

1. Sporidia sausage-shaped, almost colourless.
2. Sporidia hyaline, simple, or 1-3 septate.
3. Sporidia simple, coloured. '
4. Sporidia bilocular.
5. Sporidia coloured, septate.
6. Sporidia filiform.
7. Sporidia muriform.

These characters are not definitely stated as applicable to all the families, but under some a diagnosis is given which is not identical with that in others. (Compare pp. 1 and 5 ; 3 and 9; 2 and 7.) It is not so much with this grouping of genera that we are concerned, although that is clearly open to criticism, as with the primary features of the genera themselves, and here we cannot imagine that any practical mycologist could possibly place together as nearest allies, *Capnodium elongatum, Sphceria kerbarum, Spkceria obducens, Cucurbitaria Berberidis, Valsa fenestrata,* and- *Valsa ves-tita,* and yet these are the types of six consecutive genera, composing one group. All sense of affinity or relationship must be wholly obscured by infatuation for the one idea of conformity in shape, colour, and septation of the sporidia. One seems prepared to encounter almost anything after such a notion of botanical affinities, and even *Microthyrium microscopicum,* with *Sphceria puncti-forrnis* and *Sphceria epicymatia* in juxta-position is only accepted as additional evidence of the fact, EO often exemplified in the world,

that when men, however highly educated, suffer themselves to be caught in a stream, thoy are rapidly overwhelmed, and how devotion to a single idea may warp the judgment and confiscate all other considerations. •

The question which should be determined satisfactorily is, especially with regard to the Ascomycetes, what are the safest, soundest, and most natural groups in which, as genera, the species should be classed for purposes of study ? Should the vegetative system be adopted as the basis, or should the reproductive, or should both be combined as much- as possible ? We do not hesitate to express oui* conviction that the vegetative system should be adopted in conjunction with the reproductive, but that the latter should be subsidiary to the former. Our strongest objection to the modern carpological arrangements is that they adopt the reproductive almost absolutely, and ignore the vegetative, except when it harmonizes with the mathematical idea. If it were not so we should never sec ***Sphceria phomatospora*** **placed next to** ***Sphceria fimbriata,*** **or** ***Dia-tiype stigma*** **close to** ***Sphmia millepunctata.*** **It cannot claim to be** even a satisfactory carpological system, which recognizes as nearest **allies** ***SphcBi ia putaminnm*** **and** ***Sporormta intermedia.*** **Surely such** affinities (?) must have been inserted as a satire on a carpological classification, for whoever has seen the magnificent sporidia of Schweinitz's American *S. putaminnm* and knows the diminutive quadrilocular dissilient sporidia of the dung *Sphceria* called *Spo-**rormia minima,*** **nnd** ***Sporormia intermedia,must*** **confess that if such** indication of affinities is all that we are to expect from a " Carpological disposition," it is a most decided and indubitable failure.

Professor Saccardo has expended considerable labour in the production of his " System," which was foreshadowed by Notaris in 1844, and since applied by Fuckel, Winter, Nitschke and others in Germany. All have had some share in unsettling the old method, without ensuring unanimity in the new, for each has his own method, the only point of agreement being a Carpological basis, other coincidences following accidentally. We could have wished that so much industry, energy, and persistency had been expended in a better direction, and it is with regret that we feel compelled to oppose our esteemed friends both in Italy and Germany. Far be it from us to depreciate the labours of Continental mycologists, who, without a single exception, have always been ready to afford us every assistance in their power, most promptly and courteously, whenever we have had occasion to appeal to them. Nevertheless we recognize it as a duty, albeit not a pleasant one, to protest against the introduction and extension of a false basis of classification.

BRITISH FUNGI.

By M. C. COOKE.

CConUnued from Vol. Hi., page 186.J

Agaxicus (Lepiota) cinnabaxinus. *Fr. Epicr. ed. ii.jp.36.*

Pileus fleshy, soon flattened, obtuse, granulose-mealy, persistently vermilion; stem stuffed, somewhat bulbous, squamose below the ring ; gills free, lanceolate, white.—*Ag. granulosus* v. *cinna-barinus,* Alb. & Sch., l47. *FL Dan. t.* 1795 (gills incorrect). *Berk. $ Br.Ann. N.H., No.* 1402.

In pine woods. New Pitsligo.

Pileus 2-3 inches broad, flesh pallid, taste mild. Agaxicus (Axmillaxia) subcayus. *Schnm. Fr. Epicr., ed. ii., p.* 4G.

Pileus subuiembran aceous, convex, somewhat plane, viscid, striate to the middle, disc rather fleshy, umbonate ; stem fistulose upwards, equal, punctulate, even above the torn ring ; gills plane, decurrent, white.—*Schum. in Flor. Dan. t.*} 1843. *Berk. $ Br. Ann N~.I1., No.* 1403.

On the gruund. Cirencester. Nov.

Slender, wholly white, except the umber umbo.

Agaxicus (Txicholoma) panaeolus. *Fr. lc. t.* 36, /. 2.

Pileus between spongy and compact, convexo-plane, variegated with pruinose grey spots ; margin inflexed, repand; stem solid, short, fibroso-striate, gills arcuate, adnate, somewhat crowded, grey or dirty rufous.—*Fr. Epicr. ii.,* 73. *Berk.* <$• *Br. Ann. N.H., No.* 1404.

On the ground. Street (J. A. Clark).

Agaxicus (Txicholoma) psedidus. *Fr. Ic. t.* 46, /. 1.

Pileus somewhat fleshy, tough, convex, then flattened, depressed about the conical umbo, fibrillose, becoming smooth, moist; margin involute, naked; stem stuffed', short, somewhat striate; gills sinuate-decurrent, crowded, narrow, white, then grey.—*Berk. 4- Br. Ann. N.H., No.* 1405.

In fields. Abergavenny (J. Renny). Wollaston (Miss Hume).

Agaxicus (Clitocybe) diatxetus. *Fr. Epic. ii.,p.* 104. **Inodorous ; pileus somewhat fleshy, convex, then plane, depressed, even, smootlh, hygrophanous; stem stuffed, then hollow, elastic, even, straight, smooth and naked above ; gills decurrent, with an acute tooth, crowded, narrow, white.—*Berk. 4' Br. Ann. N.H., No.* 1406.**

In pine woods. Coed Coch.

Gathered at the same time with *A. fragrans,* from which it was at once distinguished by the total absence of the particular odour of that species.

Agaxicus (Clitocybe) angustissimus. *Fr. lc. t.* 59,/. 2. **Hygrophanous, inodorous ; pileus rather fleshy, thin, convex, then plane or depressed, even, smooth, whitish ; stem stuffed, then**

fistulose, thin, naked, flexuous; gills adnate, narrow, very much crowded, white.—*Berk. $• Br. Ann. N.H., No.* 1407. In woods. Ascot.

Agaxicus (Collybia) muscigenus. *Schim. Saell, p.* 307. **White; pileus submembranaceous, convex or plane, obtuse, even; stem stuffed, setaceous, flaccid, flexuose, equal, smooth ; gills adnate, somewhat crowded, linear.—*Flor. Dan. t.* 2023, *fig.* 1. *Mich. t. 7B9fig.* 1. *Berk. $ Br. Ann. N.H., No.* 1408. Amongst moss. Coed Coch. Stem 1 inch, pileus 1-2 inches broad.**

Agaxicus (Collybia) ambustus. *Fr. Ic. t.* 70, /. 2. Pileus submembranaceous, convexo-plane, papillate, striatulate, hygrophanous; stem somewhat stuffed, tough, short, livid ; gills adnate, crowded, lanceolate, white, then tawny.—*Berk. <$• Br. Ann. N.H., No.* 1409.

On burnt earth. Kew.

Agaxicus (Collybia) Stevensoni. *B. <& Br. Ann. N. H., No.* 1497. Pileus semi-ovate, obtuse, viscid, pallid, yellow, here and there spotted ; stem thin, fibrillose, pulverulent above, externally and internally rufous, rooting; gills broad adnate with a decurrent tooth, distant, white.

Glamis (Rev. J. Stevenson). Aug.

Pileus ^ inch across and high ; stem 1^ inch high, scarcely a line thick, composed of fibres.

Allied to *Agaricu8 ventricosus*, but differing in its slender almost solid stem, viscid, semi-ovate pileus, and very broad, adnate, somewhat ventricose, plane gills.—*B. $ Br.*

Agaxicus (Mycena) galexiculatus var. Calopus. *Fr. Ic. t.* 80, *f.* 2.—*Berk. $■ Br. Ann. N.H., No.* 1410. On blocks of wood in a fernery. Coed Coch.

Agaxicus (Mycena) aetites. *Fr. Ic. t.* 81,/. 5.

Fragile; pileus membranaceous, campanulate, then convex, smooth, sulcate, hygrophanous, with a broad obtuse prominent umbo; stem unequal, somewhat compressed, smooth, shining; gills uncinate, subarcuate, thin, connected by veins, whitish.—*Fr. JEpicr.* «., 143. *Berk. & Br.Ann. N.H., No.* 1411.

Amongst mosses. Ascot.

Agaxicus (Omphalia) philonotis. *Lasch.Fr. Ic. t.* 76, *f.* 1.

Fragile, cinereous, dingy; pileus membranaceous, hygrophanous, floccose when dry; margin erect; stem fistulose, smooth ; gills very decurrent, rather distant, narrow, white, then smoky. _ *Fr. Epic,* M., 158. *Berk, fy Br. Ann. N.H., No.* 1412.

On *Sphagnum.* Glamis (Rev. J. Stevenson).

Agaxicus (Omphalia) umbellifexus. *Fr.* var. Abie gnus.—*Berk.*

***$ Br. Ann. N.H., No.* 1413.**

On decayed fir stump. Coed Coch. Pale yellow.

Agaricus (Entoloma) ^esutus. *Fr. Epicr. ii.*$_9$193.

Pile us somewhat fleshy, convex, obtuse, adpressedly squamuL or *ft*brillose, becoming ^brownish, centre darker; stem soniewl stuffed, equal, soft, smooth; gills slightly adnexed, ventricos rather thick, grey.—*Berk. $ Br. Ann. N.H., No.* 1414.

Pastures. Glamis (Rev. J. Stevenson).

Stem 1^-2 in. long, pileus 1 in. broad. Inodorous.

\ **Agaricus (Nolanea) icterinus.** *Fr. Epicr. it.,* 209.

Pileus somewhat membranaceous, campanulate then conve striatulate, papillate, greenish becoming yellowish, hygrophanou. stem somewhat stuffed, short, rigid, clad with flocculose mea gills affixed or free, distant, ventricose, pallid.—*Berk. §• Br. An, N.H., No.* 1415.

In gardens and woods. Edensor (J. Renny).

Agaricus (Nolena) coelestinus. *Fr. Epicr. ii.,* 210.

Pileus membranaceous, campanulate, obtuse, striate, smooth, light-blue, disc darker, slightly scabrous, stem fistulose, even, smooth, dark steel-blue, pruinose above ; gills adnate, very broad, somewhat crowded, whitish.—*Berk. $ Br. Ann. N.H, No.* 1416.

On old oak trunks. Oct.

Agaricus (Eccilia) flosculus. *Smith Journ. Bot.* 1875, *p.* 97, *t.* 1G1,

/. 4 9.

Pileus sub-membranaceous,pruinoso-crystalline,deeply umbilicate somewhat irregular, black-brown, becoming white with age ; stem, '■pruinose or innato-fibrillose, cartilaginous with a ffcshy pith, attenuated downwards ; gills decurrent, somewhat waved, thick, pink; spores nodulose.

I On the ground at the foot of and upon the stems of tree ferns *(Dzcksonia cmtarctica)* at Messrs. Veitch's Nursery, Chelsea, June, 1870. Allied to the next, but **a** very different plant, the dark-brown trama and external pruinose-crystallinc stratum are cha-•acteristic.

This species doubtless is not truly British, nor can the next be scarcely regarded as such.

Agaricus (Eccilia) acus. *Smith. Journ. Bot.* 1875,^.97, *t.* 1C1 *f.* 14-20.

2. **Agaricus** *(Eccilia)* **acus,** *nov. sj>.* Pileus submembranaceous, deeply umbilicate, densely pruinose, white ; margin striate and incurved ; gills thick, distant, deeply decurrent, pink; stem cartilaginous, smooth ; odour strong, fungoid ; spores nodulose.

Amongst germinating coffee-seeds in cocoa-nut fibre; Royal Gardens, Kcw. Gathered by the Rev. M. J. Berkeley, in August, 1873. It differs in its snow-white pruinose pileus, and in other characters from all other described species. Its nearest ally is *A. carneo-griseus,* B. & Br.

Agaricus (Eccilia) atropunctus. *Pers, Syn. p.* 353. Pileus somewhat fleshy, soit, hemispherical,pale-cinereous; stem >mewhat tough, pallid, smooth, clothed with black

punctiform quamulse; gills decurrent, arcuate, distant, alternate, cinereous-

!li-coloured.—*Fr. Epic, p.* 159. M, *p.* 212. *Smith in Journ. >t.* 1875, *p.* 98,*. 161,/. 10-13.

Amongst moss in an oak wood. Near Hereford. Oct. (Dr. lull).

Gregarious* small, pileus ^-f in. across. Taste disagreeable, whole plant brittle, and the pileus inclined to be somewhat irregular.—TF". *G. S.*

Agaxicus (Hebeloma) Bongaxdii. *Weinm. Fl. lluss., p.* 190. Pileus rather fleshy, campanulate, obtuse, disc squamose, torn id fibrillose about the margin, stem solid, rigid, pallid rufous, Iky below, pulverulent and whitish above, gills adnate, ventricose, tile-reddish then cinnamon.—Fr. Epicr. ii, 229. Kalch. 1c. t.

<:0. f 2. *Berk. & Br. Aim. N.lL, No.* 1417. " *′

On Culbin sand hills, near the Find horn-mouth (G. Norman). [s]

Stem 2-3 inches. Pileus 1-1^ in.

Agaxicus (Hypholoma) stoxea. *Fr. Epicr. ii.,* 293.

Pileus fleshy, convexo-plano, umbonato, dry, fibrillose, stem solid, elongated, equal, even, subfibrillose, gallid, gills adnate, dry, livid, becoming brownish, margin serrulate and white.—*Berk, fy Br. Ann. N.H., No.* 1418.

At the base of trees. Ascot. Coed Coch.

Stem 4-5 in. long 4 lin. thick; pileus 3 in. broad.

Agaxicus (Hypholoma) eloeodes. *Fr. Epicr. ii.,* 291.

Pileus fleshy, somewhat plane, subuinbonate, dry, smooth, flesh yellow, stem stuffed, then hollow, equal, fibrillose, becoming ferruginous, gills adnate, crowded, thin, greenish then olive.—*Paulet t* 108. *Bull. t.* 30, *Larbr. t.* 16,/. 2. *Berk.* <$• *Br. Ann. N.IL, No.* 1119.

On trunks, &c. Slough (M. Terry).

Agaxicus (Hypholoma) silaceus. *Ters. Syn. pA2l.* Pileus fleshy, convex, viscid, orange-red, silky about the margin whitish, stem stuffed, then hollow, bulbous, shining, fibrilloso-striate, gills adnate, crowded, grey, then olive.—*Bait. t.* 22 *E. Berk. $ Br. Ann. N.H., No.* 1498. Glamis. (Rev. J. Stevenson.)

Pileus viscid, bright orange rufous ; stem 4in. high, at length hollow, solid and slightly swollen at the base; smell resembling that of meal. Spores pale purple-brown.

Cortinaxius (Znoloma) txaganus. *Fr.*

Var.-finitimus Weinm, p. 155. *B. & Br. Ann. N.H., No.* 1499. Smell not at all that of the typical form, but pleasant though peculiar, resembling that of gum just beginning to ferment. Pileus silky, at length smooth, lilac, as is the stem, which is yellowish and mottled within, but not saffron-coloured- nor brown.—*B. $ Br.*

Hygxophorus foxnicatus. *Fr. Epicr. ii.,* 4H. Whitish, pileus fleshy, thin, campanulate, then expanded, evoi smooth, viscid; stem fimi, equal, tough, smooth, gills sinuate

CARrOLOGY OF PEZIZA.

adr *[Vlates* 50 *and* 51.]

ALEURIA.

228. P. hinnulea, *B. $ Br.*, ex. herb. M. J. B.
229. P. exidiiformia, *B.* cj* *Br.t* ex. herb. M. J. B.
230. P. Thumeni, *Karst.*, Thumen Myc. Un., No. 126.
231. P. limnicola, *Hazs.*, ex. herb. Hazalinbzky.
232. P. echinospermsi, *Pic*, ex. herb. C. H. Peck.
233 P. miltina, *Berk.*, ex. herb. M. J. B.
234 P. carbonigena, *Berk.*, ex. herb. M. J. B.
35. P. calyx, *Sacc*, ex. herb. Saccardo.
36. P. aggregata, *B. & Br* , ex. herb. M. J. B.
37. P. quisquiliarum, *B* , ex. herb. M. J. B.
38. P. Mulleri, *Berk.*, ex. herb. M. J. B.
139. P. astroidea, *Hazs.*, ex. herb. Hazalinszky.
40. P. convexella, *Ka.rst.*, ex. herb. Karsten.

LACHNEA.

241. P. alpina, *Fckl.*, Pckl. Fungi. Rhen., 2637.
242. P. miniata, *Fckl*, Fckl. Fungi. Rben., 2083.
243. P. mutabilis, *B. $ Br.*, ex. herb. Bloxam.
244. P. TorulSB, *Fckl*, Fckl. Fungi Rhen., 1596.
245. P. sanguinea, P., Rabh., F. E , 226.
246. P. fusca, P., ex. herb. M. C. C.
247. P. maculans, *Rehm.*, Rehm. Ascomy., 155.
248. P. herpotricha, *Berk.*, ex. herb. M. J. B. a, mycelium.
249. P. aurea", *Fckl.*, Fckl. Fungi Rhen., 2476.
250. P. caeria, P., Fuugi Britt. i., 562.
251. P. chavetise. *Lib* , Libert. Exs., 26.
252. P. aurata, *Fckl.*, Fckl. Fungi Rhen., 2-480.
253. P. itoaj, P., ex. herb. M. C. C.
254. P. prunicola, *Fckl.y* Fckl. Fungi Rpen., 1191.
255.' P. aurelia P., Phillips Elv. Britt., 29.
256. F. retincola, *Rabh.*, Rabh. F. E., 225.
257. P. virensi, *A.* c0 *S.*, ex. herb. Klotsch (immature).
258. P. spicarum, *Rehm.*, Rehm. Ascomy, No. 158.
259. P. Rhododendri, *Ces.*, Erb. Critt. Ital., 536.
260. P. pomicolor, *B.*, ex. herb. Ravenel (not mature).
261. P. bolaris, *Batsch* , Libert Exs.
262. P. cedrina, *Oer* , ex. herb. W. R. Gerard.
263. P. strobilina, *Fr* , Rabb. Fungi Eur., 624.
264. P. controversa, *C.* (P. litorea, *Rehm.),* Kehm. AaJ[101]??*. No. 114.
265. P-apala, *B. $ Br.*, Phil. Elv. Britt., 27. = /P- *Juncicola,* Fckl. Sjm. p. 305. Rabh. F. E., 517.
266 P. luzulma, *Ph.*, ex. herb. W. Phillips.
267. P. cephaloidea, *Fckl*, Fckl. Fungi Rhen., *l&ij*'
208. P. patula, P., Libert Exs., 225.
2U9. P. nivea *Fr.*, ex. herb. M. C. O.
270. P. subgibliosa, *Ellis*, ex. herb. J. B. Ellis.
271. P. Mulphurella, *Pass* , ex. herb. Passerini.
272. P. virgiuea, *Batsch*, ex. herb. M. C. O.
273. P. Tilise, *Pk.*, ex. herb. C. H. Peck.
274 P. Cookei, *Pass.*, ex. herb. Passerini.

NOTE.—Fig. 193 is *Peziza vexata,* Not.-, und different fr<>m P. *palearum,* Desm. Fig. 190 is an error, now inexplicable; the ~ *ezlza P atula*> published by Libert, i> different (see fig 2(58).

Fig. 183, under P. *apala is* apparently >P* ^^^*ta,* as the true P. *ajpala,* B. & Br., ia fijrured at fig. 2(55.

Fig. 168, P. *chrysophthalma,* does not ifHJ" to dlffer from p. *suecicai,* Fckl.

All the above figures are-drawn to the same 8Cale aa in tho Previous plates.

ON THE COLLEMEI OF THE CIRENCESTER OR COTTESWOLD DISTRICT.

By W. JOSHUA.

It may not be uninteresting to your readers to record "what has been done in this very interesting section of Lichenology in the, till recently, unexplored Cotteswold district in the West of England. By way of introduction, it may be desirable to state the meteorological influences which tend to call these fragile plants into existence, and keep them supplied with the necessary nutriment.

The district under notice is situated on the Great Oolitic formation, near one of the sources of the river Thames, about the centre of the Cotteswold range; consisting of a long tract of high ground in the eastern part of Gloucestershire, extending from the hills of Stinchcombe and Nibley in the south, to Bredon in the north, and attaining an altitude of from 500 to 1000 feet.

The soil is various, consisting of open stone-brash, loam, and' Bradford and Forest marble clay, alumine and lime predominating, with 20 to 30 per cent, of siliceous sand. The air is decidedly sharp, but the temperature not unequal. The average annual rainfall does not exceed 29 inches, which is below that of many other counties.

The porous nature of the Oolite affords a firm resting-place for the larger Collemei, which flourish principally on the stone walls so ^ common in the district; here they have the advantage of catching V falling drop of moisture to stimulate their growth, while the B forms choose the fresh mortar of the surface, or the sides of da[1] [m]P shady banks, in lanes not wholly obscured from the sun. It is a ' curious fact that, although containing in a moist growing state, as Jj[as] heen lately ascertained by Professor Church, from 75 to 95 per c'ent. of water in their composition, they resist, equally with other hi'hens, the greatest extremes of heat and cold.

The *Collemii nigrescens,* L., I believe to be the only representative of the *CofJicolous* species, but I have recently discovered on leaves of the Por tngal laurel, associated with *Strigula Babingtonii*^ Berk., a collemokl growth. The *C. epiphyllvm* of Leight., which has proved to be *xAtichia Mosigii,* Flot., the true place of which, in the entire absence of all fructification, is somewhat uncertain. The species belonging *ts*> this tribe, which have come under my own notice in the district/Are as follow:—

CollemopBis SchBereri, *Mass*\ Abundant in old quarries. Cowcombe Wood.near
\ Chalford
„ Arnoldiana, HepjX A new British addition, but scarcely differing
v from C. Flotoviana. On *the* Oolite in the fformer locality. Collema myriococcum, *Ach.*
On W»11B ; not very common. Barnsley Park.
nea\r Cirencester.
C. auriculatum, *Hffm.* "\ Different conditions of the same species, and
farvum, *Ach.* *I* occur^ abundantly on walls, frequently well
donnatinum. W fruiteNd throughout the district,
tunraforme. *J* ^

Collema pulposum, *Bernh. p.*	Common on banks and walls.
Compactum, *Ach.*	Not common. Near Cirencester.
ceranoides, *Borr.*	The true plant of Borrer. On ground. Minch-inhampton Common. Eare in fruit.
pulposulum, *Nyl.*	A good subspecies, on canal walls, near Cirencester.
C. limosum, *Ach.* C.	On clayey soil, near Wooton-under-Edge»
cri spurn, *Huds.*	Banks and walls.
cristatulum, *Nyl.*	A diminutive form of C. crispum. Common.
C. chirleum, *Ach.*	The typical form, common on wall tops in damp situations.
/3. monocarpon, Dw/.	A good subspecies. On mortar. ^
malsBnum, *Ach.*	In large circular patches on walls in damp situations.
a. marginale, *Huds.* ?	On slates. Shipton.
cristatum, *Schrad.* C.	Walls. Barnsley Park.
polycarpon, *Schcer.* C.	On limestone, near Oaksey.
stygium, *Del.* C.	Canal wall, near Cirencester.
multipartitum, *Sm.* C.	Very rare. Among mosses. Barnsley Park.
nigrescens, *Huds.* <Leptogium	On ash. Kemble. Generally infertile.
amphinaeum, *Ach.*	On ground. Near Stroud. Probably a form of L. subtile.
L. tenuissimum, *Dcks,* L.	On banks near Storehouse.
cretaceum, *Sm.*	Old quarries on the Oolite, near Cirencester. Bare.
L. pusillum, *Nyl.*	Abundant on fresh mortar, near Cirencester; probably identical with Collema biatorinum, *Nyl.*
L. lacernra,	Common everywhere.
a. fimbriatum, *ITffm.*	Cowcombe Wood.
pulvinatum, *Hffm.*	Common. Well-fruited. On walls.
intermedium, *Am,*	On ground, among mosses. Near Chalford. There is also a very dark form of L. laurum, very minute, always barren, occurring on the mortar of walls.
L. subtile, *Schrad.*	This occurs on clay banks, near Wooton-under-Edge. Thallus well developed ; also in the crustaceous form. Near Chalford.
flatiusculum, *Nyl.*	On banks near Stonehouse. Bare, and hitherto new to our flora.
L. sinuatum, *Huds.*	Common on walls; fruit abundant.
L. plicatile, Ac/i.	On walls, near chuTch, Aston Keynes. Though common, it is rarely to be met with in a fertile state ; it was formerly classed as Collema.
L. turgidum.	Walls. Sevenhampton. Generally fertile.
L. schraderi, *BertJi.*	On bridge, near canal, Cirencester. Well fruited.
L. microscopicum, J	Old quarries, Cowcombe Wood, near Chalford. Very sparingly fruited, accompanied with apothecia of Byrenocarpoid growth, which, if not referable to Obrysum, will probably prove to be fungoid. *

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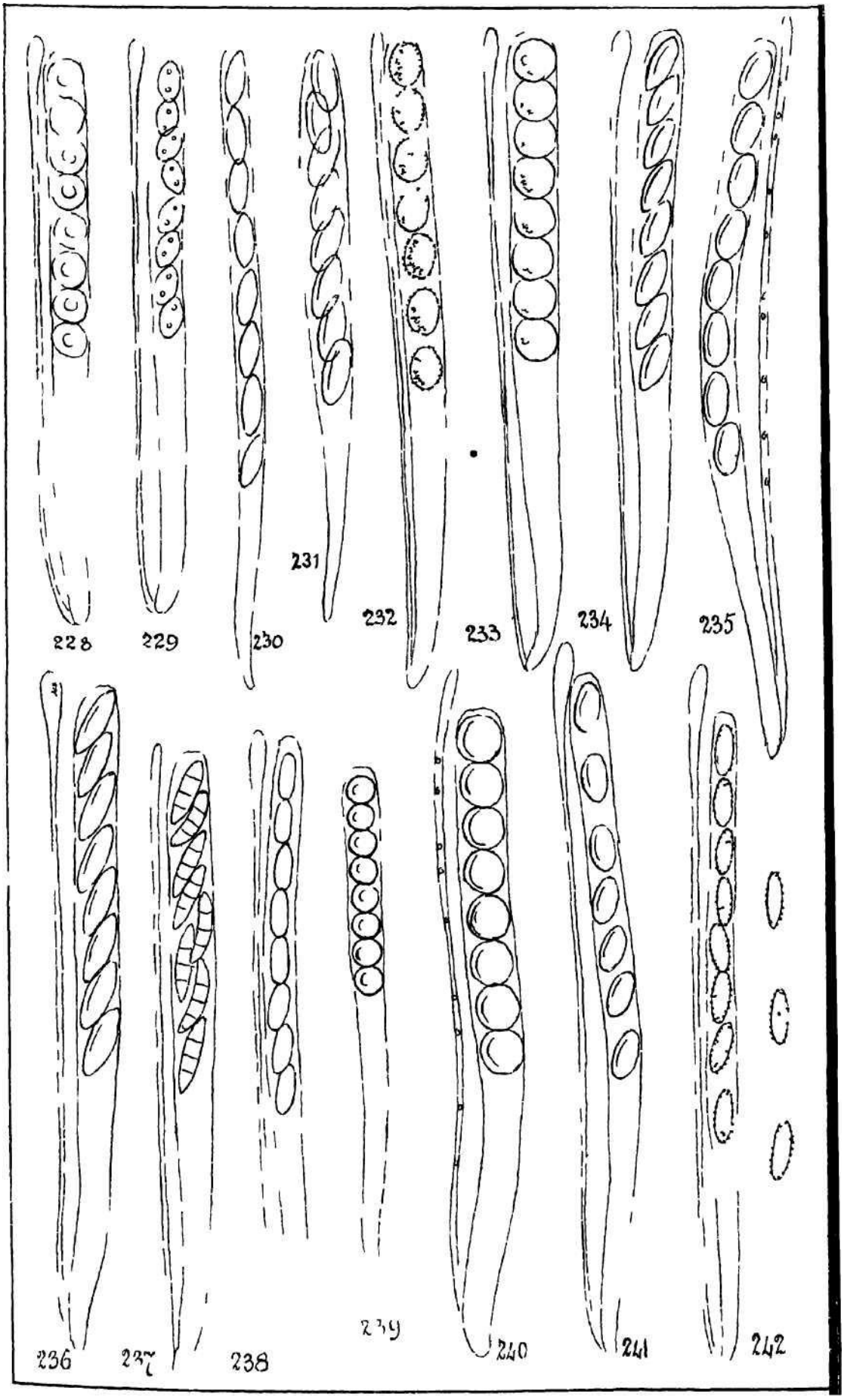
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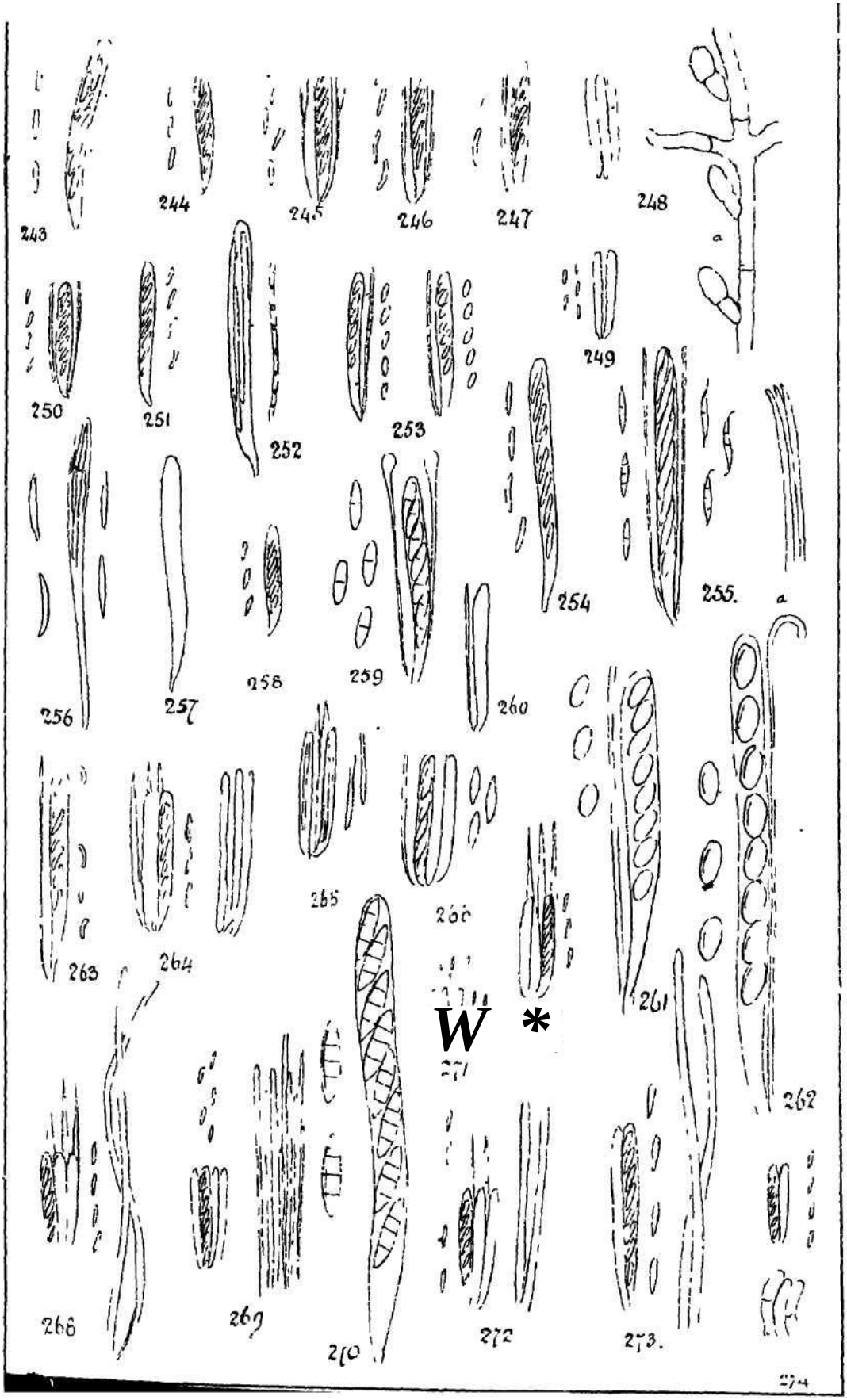
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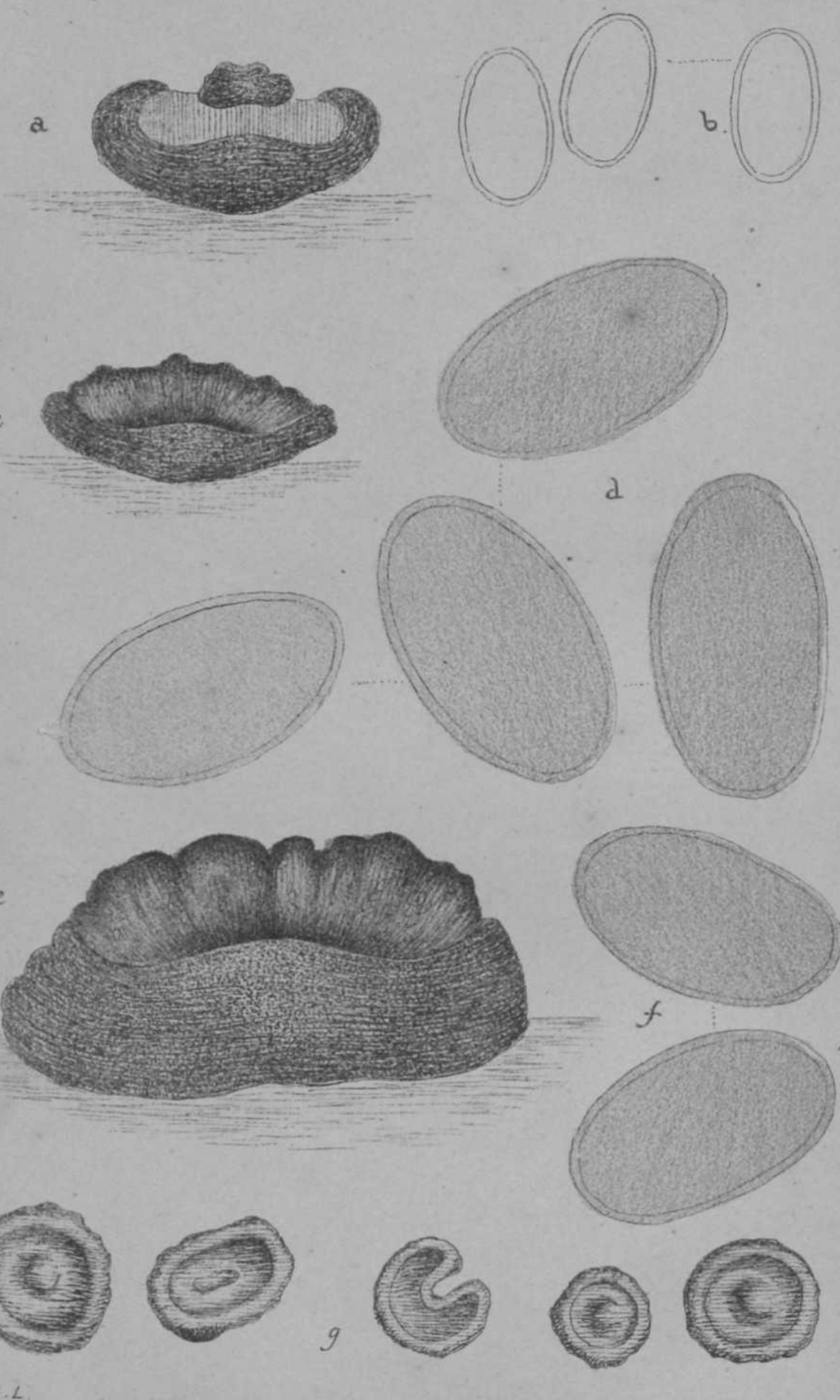
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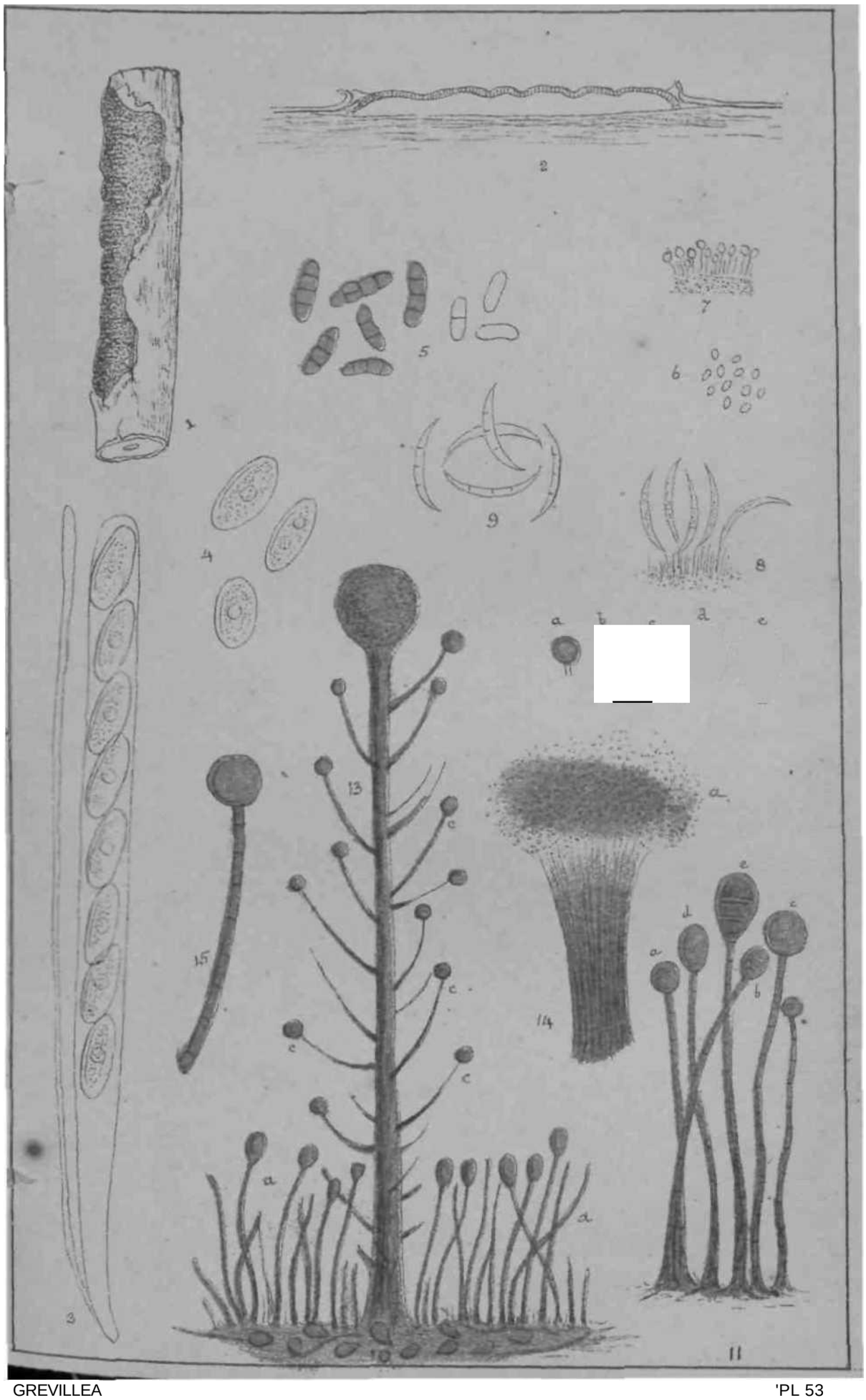
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No. 30.] **[December, 1875.**

Grevillea,

A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY AND ITS LITERATURE.

NOTICES OF NORTH AMERICAN FUNGI. *By the* REV. M. J. BERKELEY, M.A., F.L.S.

(Continued from Vol. III., Page **16.**)

814. **Nectria aglaeotliele.** *B. % C.* — Pallida ; ostiolo papillse-
formi demum collabente; ascis linearibus; sporidiis ellipticis uni
septatis.

On alder. Apparently growing on the remains of some *Coccus.* New England, Sprague. No. 5378.

Pale; ostiolum distinct, papillaeform darker, then deeply sunk by collapsion; asci linear; sporidia elliptic, uniseriate, slightly attenuated at either end, '00057 inch long. *Nectria crustulina*y ■B. & **Rav.** Santee Canal. No. 1865, with caespitose neat tan-coloured perithecia is a stylosporous form, with obovate uniseptate spores, -0006--0004 inch long.

815. **Nectria Russellii.** *B. % G*— Csespitosa, rubra, ostiolo papil-
laeformi dein collabente; sporidiis cymbaeformibus uniseptatis.

On elm. New England, Russell. No 5447. ^

Csespitose, red, inclining to brown, ostiolum papillceform, at length sunk fromcoUapsion, sporidia cymbiform, uniseptate, *0006-•0008 inch long. No. .2154, on *Morus,* Car. Inf., scarcely differs.

81G. **Nectria viticola.** *B. & C*—Parva, nitide coccinea, mollis lateraliter collabens e strato albo tenui oriunda; sporidiis uniseri-alibus ellipticis uniseptatis.

On branches of vine. Alabama, Peters. No. 5225. Scattered, bright ciimson, soft, collapsing laterally, seated on a thin white mycelium ; sporidia uniseriate, elliptic, uniseptate.

817. **Nectria offuscata.** *B. & C*—Caespitosa brunneo-rubra, sub-tiliter granulata ostiolo collabente ; ascis clavatis ; sporidiis biseri-alibus oblongis angustis hyalinis.

On *Hibiscus syriacus.* Car. Inf. No. 2865.

Caespitose, dingy dark brown-red; minutely granulated ; ostiolum depressed ; asci clavate; sporidia biseriate, oblong, about £th as

broad as long; externally resembling *N. Russellii*.

* **WTectria cinnabarina.** *Fr.*—Car. Sup. No. 138. Car. Inf. -No. 1399. On *Morus.* Mountains of New York. On *Acer.* No. 4430. On gooseberry. No. 4433.

818. **Nectiria diploa.** *B. & c.*-« Journ. Linn. Soc " x., p. 378.

Var. **diminuta.**

Minuta parasitica coccinea; ascis lanceolatis; sporidiis brevitcr fusiformibus, 2-4 nucleatis.

On sfome *SphcBria.* On alder. Car. Inf. No. 4029.

Very minute, parasitic, scarlet; asci lanceolate but obtuse ; spo-ndia sometimes larger, binucleate, at length uniseptate, in one row or smaller quadrinucleate, biseriate, -001-00114 inch long.

819. **Nectiia Cuirtisii.** B.-Minuta, erumpens sparsa; ascis lanceolatis, sporidiis oblongis curvis, quadrinucleatis. -

On *Zea.* Car. Inf. No. 3795.

Minute, erumpent, scattered; asci lanceolate, sporidia oblong, curved, with four nuclei, -0005 inch long, about Jth as broad as long.

• **Nectiria polythalama.** .B.-Fl. New Zeal., II., p. 203. Tab. cvi., fig. 15. *9 i v*

On *Liquidambar.* Alabama, Peters. No. G082. On *Fraxinus.* Car. Inf. Ravenel. No. 1549.

Sporidia curved,~pluriseptate, -001--0008 inch long.

820. **Nectiria** auriger. B. *& R.*—Caespitosa aurco-pulverulenta ostiolo coliapso fusco, sporidiis breviter cymbarformibus utrinquo attenuatis pluriseptatis.

On *Fraxinus.* . Car. Inf. Ravenel. No. 1830.

Perithecia clothed with yellow powder, ostiolum dark, depressed; sporidia cymbaeform, slightly attenuated at either end, with about seven septa, 001 inch long.

Var. **flaritecta,** *B. 8r C.* Sporidiis majoribus 4-septatis.

On *Kerria Japonica.* Car. Inf. No. 4025.

Sporidia quadriseptate, sometimes with a gelatinous coat, -0015 inch long. Possibly a distinct species, but the specimen is not in good condition.

* **Sphaiostilbe pseudotrichia.** *Schwein.* (Sub Spharia.) Nectria.

f **C ;n T " Ac Nat Sc Phil -> »•> 1853, p. 289, tab. 25, fig. 9, Journ. Lmn. Soc," xiv., p. 1H. Canada, Poe. No. 6140. «™ BnhT?^ C^aiilla- ™-Carp. iii., p. 103. Louisi-S5r?n"JSe' ^°-.367S °n hickory. Car. Inf! Ravenel. 1339. Iheie: aie two specimens from Ravenel. On *Moms.* No. 1432.

* **Sphasrostilbe gracilipes.** r^.-Carp. in., p. 102

On *Hibiscus synacus.* No. 2637. C *Melia.* Ravenel. No. 1439. On ? bama, Peters. On *Carya.* No. 5247.

Sphtexostilbe coccophila. *Tul.* 1. c. p. 105.—On *Alms serrulata.* Pennsylvania, Michener. No. 4316.

It is not quite certain that this is Tulasne's species. The conidia are those oi an *Atntctium,* '002 long.

* **Sphaexostilbe flammea.** *Tul.* 1. c. p. 1U4.—On *Acer ruhnim.* Car. Inf. Ravenel, No. 1843.

There is a very distinct species on *Magnolia glauca.* bar. Int. No. 5005 *(Atractium pallidum)* B. & 0., with short fusiform spores, •0005 inch lon<?, with the endochrome retracted to either end; also Ravenel, No. 976 and 1433. On *Pannelia* and *Frulltmia Virgi-nica,* which may possibly be the conidiiferous form of *Nectna* ***muscivora.***

* **Cucuxbitaxia elongata.** *Grev.*—On *Robinia.* Mountains of Virginia. No. 3307, 3323. New York, Sartwell. No. 3624. On *Gleditschia.* No. 5974. Car. Sup. No. 841.

* **Cucuxbitaxia Gleditschiae.** *Schnein.*—Car. Sup. No. 841,942. Sporidia ovate, uniseptate.

* **Cucuxbitaxia Bexbexidis.** *Tul.*—New England, Russell. No. 5961, 5980.

* **Cucuxbitaxia** tumoxum. *Schrvein.*—Canada, Poe. No. 6141.

821. **Cucuxbitaxia callista.** *B. Sf C*— Effusa, peritheciis in crustam fuscaminsidentibus primum globosis deincollapsis; sporidiis minutis allantoideis.

On Hornbeam. No. 342.

Forming a continuous effused patch ; perithecia seated on **a** brown crust, at first globose, then collapsed ; sporidia minute, sausage-shaped.

822. **Cucuxbitaxia bxevibaxbata.** *B. § C.*—Csespitosa globosanec collapsa mimitisshne tomentosa; "ascis clavatis faretis; sporidiis allantoideis.

823. **Xylaxia Titan.** *B. <k C.* — Gigantea allantoidea dura extus albida ; o&tiolis nigris prominentibus.

Texas, Lindheimer, No. 2676.

Five inches long, 2 inches wide, sausage-shaped, convex on one side, hollow on the other ; hard, solid, dirty-white, stained with the sporidia and dotted with the prominent ostiola.

824. **Xylaxia cudonia.** *B. fy C*—Sublaccata; stipite curto sursum dilatato; cupitulo hemispherico e peritheciis papillato; ostiolis liiinimis.

On a dead tree. Car. Inf. Santee Canal, No. 3220.

Slightly laccate, shining; stem ^ inch long, nearly 2 lines thick above; head semiglobose, $_{T}{}^{5}$^ inch across, slightly papillose from the projection of the perithecia; ostiola very small.

825. **Xylaxia clavulus.** *B. $ C.*—Farva seriata ; stipite brevi
crassiusculo penetrante ; capitulo convexo.

On the dead stem of some grass. Texas, C. Wright, No. 3150.

Gregarious, seriate. A miniature of the last. Stem with the head about 1 line high, not laccate, rather thick for the size of the plant, penetrating the convex papillate head. A very curious little species.

* **Xylaria digitata.** *Ih*\—Car. Sup. No. 417. Texas, Lind-
heimer, No. 3627.

* **Xylaria polyxnoxpha.** JV\—Car. Sup. No. 450, 739. Penn
sylvania, Michener. No. 3782.

* **Xylaria Coxnu-Daxnae.** *Sclmein.*—On dead wood* Car. Inf.
Ravenel.

* **Xylaria corniformia.** -F/v—Car. Inf. No. 1124. Car. Sup.
No. 733.

On *Rhus copallina*. Car. Inf. Ravcnel. No. 1803. On *Po-pulus dilatata*. No. 914. On *Acer rubrum*. Ravenel. No. 1558, and *Myrica cerifera,*

Csespitose globose, not collapsed, clothed with very minute black pubescence ; asci clavate, stuffed with multitudes of minute sausage-shaped sporidia.

* **Xylaria flabelliformis.—***Schwein.*—Car. Inf. No. 1213, 2609.

* **Xylaxia pedunculata.** Jr.-St. Louis, Missouri, Dr. G. En-
gelmaan. No. 6429.

* **Xylaxia hypofeylon.** *FT.*-— Car. Inf. No. 57. 116. 737. 600.
1824. Ravenel, No. 1277. Pennsylvania, Michener. No. 3924.

* **Xylaxia per sic aria.** *Schrvein.*—On peach stones. Car. Inf.
No. 3218.

* **Xylaxia caxpophila.** *Fr.*—On nuts of *Liquidambar.* Car.
Inf. No. 1175. Ravenel. No. 1279. 1277.

* **Xylaxia tXlifoxmis.** .JV.—On dead leaves. Car. Inf. Ravenel

* **Xylaxia rhopaloides.** *Mont.*— Var. **aciculaxis,** *B.* More
slender and delicate. Car. Sup. Ravenel. No. 1301. Car. Inf.
No. 68. 248. 433. Texas, C. Wright. No. 3904.

826. **Xylaxia tentaculata.** *B. fy Br.*—Stipite elongato glabro fusco ; capitulo brevi cylindiico processibuslongis tentaculiformibus coronato.

Iu shaded swamps among mosses and rotting wood. Car. Inf. Ravenel. No. 1300. On the fruit of some *Leguminosa.* Cordova. Stille. No. 92.

Stem 1 inch high, not a line thick ; head cylindrical, 1-2 lines long, ostiola prominent, tending upwards, crowned by several ten tacular processes, about £ an inch long. Allied to *Xylaria comosa,* Mont.

Alabama, Peters. No.

4019. Texas, C. Wright. No. 3778. • **Hypoxylou conceutiicum.** <?w._Car. Sup. No. 70.

*** Hypoxylon Petersii.** *B. <k C.* —Journ. Linn. Soc. x., p. 384. On rotting oak. Alabama, Peters. No. 4903. Cuba, C. Wright. Sporidia 0003 long.

b27. **Hypoxylon malleolus.** *B. fy Bav.*—Globosum confluens, ostiolis annulo depresso circumdatis, stroinate nigerrimo. On oak trees. Car. Inf. Ravenel. No. 1646. Globose, | inch wide, but often laterally confluent, ostiola papil-lajform, sunk in an annular depression as in *H. marginatum ;* stroma jot black.

» 828. **Kypoxylon glomifoxme.** *B. Sf C.*—Hemisphericum ferru-gineo-pulveraceum, denium denudatum nitiduni lseve; peritheciis conditis ; stromate atro-fusco.

On bark of *Quercus nigra.* Connecticut, C. Wright. No'. 5632. 6368.

Gregarious, hemispherical, nearly £ inch wide, at first clothed with ferruginous powder, then black and shining, even, perithecia hidden without any external trace of ostiola ; stroma dark brown.

829. **Hypoxylon Murraii.** *B. % C.*—Subglobosum extus iiitus-que nigrum, ostiolis dense papillosum.

On dead bark. Boston, Murray.

Gregarious, subglobose, a line or more broad, black without and within, densely papillose with the minute ostiola. The specimens are unfortunately without fruit. It resembles externally *13. bontba,* Mont., except the densely papillose surface.

* **Hypoxylon fragiforme.** *Grev.*—Car. Inf. No. 1420. Cotoosa Springs, Ravenel. No. 1740. Rhode Island. Olney. No. 1855. Amherstburgh, Dr. Maclagan. No. 372. Sartwell. No. 2736.

* **Kypoxylon argillaceum.** *(Pj*—Canada, Dr. Maclagan. No. 291.

* **Rypoxylon fus cum.** *(P.j*—On *Betula ruhra^ Laumis benzoin. Ilex opaca, Cerasus avium.* Car. Sup. No. 16, 106. 1&7. 312. Pennsylvania, Michener. No. 4121. Car. Inf. Ravenel. No. 1751.

* **Hypoxylon cohaerens.** fPj—On oak, beech, *Nyssa. Acer Pennsylvanicum.* Car. Sup. No. 69. 842. Car. Inf. No. 2206. Mountains of New York. No. 4437. 4503. Cotooso Springs. 1 avenel, No. 1741. Sporidia *0003 inch long.

* **Hypoxylon marginatum.** *(Schwein.J*— On oak. Car. Sup. No. 58. 104. 129. 240.376' Car. Inf. No. 1482. 1546. 1571. Ravenel, No. 531. 1753. Cotoosa Springs. No. 1739. var. EFFUSUM. Ala bama, Beaumont. No. 4855. On *Myrica cerifera.* Car. Inf. Ravenel. No. 1578. 1823. Dr. Maclagan. No. 367.

Amheifet-
burg.

* **Hypoxylon multifoxme.** *Fr.*—On oak. Car. Inf. No. 1538. 2370. 2525.

830. **Hypoxylon crocopepluxn.** *B. fy C.* —Irregulare depressum pulvere crocino tectum; peritheciis prominulis, ostiolo minuto.

On decayed bark. Car. Inf. No. 1906. Nearly 1 inch broad, irregular, depressed, clothed with a dense coat of red ieriugi (peroxyd) powder ; perithecia rather prominent, with a minute o olum, sporidia dark, shortly cymbaeforme.

* **Hypoxylon rubricosum.** *Mont.-On* ash. Car. Inf. No. 600/. Bavenel. No. 1835. On *Melia azederach*. No. 1795. Spandm •0004 inch long.

831. **Hypoxylon** gemmatum. *B. $ Mav.*- Parvum, rubiginosum, ostiolis prominulis nigris centro perforate On *Liquidambar*. Car. Inf. Kavenel. No. 138p.

Small, scarcely a line broad, pulvinate but flat, rubiginous, some times transverse, studded with the black prominent ostiola, wmo are perforated in the centre.

832 Hypoxylon jecorinum, 5. fr i^.-Effusum P"1^ ™V° prhnumlectum demum jecorinum ; ostiolis prom.nuhspunctatum. P Onlogsof^rto. Car.Inf ^fgj^y, dotted Effused, an inch or more long and broad, at fiist «jwny with dark ostiola, then liver-coloured. No. 1828 differs only in having the pcritheoia more pro"»nent-

833. **Kypoxylon** sum pulveruleutum, penthecns uninucleatis. "Ravenel No. 1579.

ascSar.Vidia cymb.fonn, -0036 **W** *f* \

* **Kypoxylon decoxticatum**

83. **Hyphen .nyrfan^** V ^S^M^ natum, ferruginum ™S<>B«m^P.?n*he?i^JC[l];Sr.£ triseptatis. ascis lineari-lanceolatis ; "P0"4118/"8*™^0™^,. 1363. On bark of Hornbeam. Car. Inf. Ravenel. iNO. Orbicular, pulvinate, flat, rugose, ferruginous , peritlRC F minent, collapsing ; asci linear-lanceolate, spondia bisenate, form, curved, triseptatc. # .

835 **Hypoxylon notatum.** *B.* * C.-Peritheciis paucis majon-bus in pulvinulos congestis, rubiginosis, ostiolo demum truncaio

OnS/^. Car. Inf. No. 1910. On oak. Car Inf. No. 2205. On *Viburnum dentatum.* Pennsylvania, Micnener, i •

Pe'ritbecia few, rather large, crowded into a little pulvinate mass clothed with rubiginous powder, ostiola at length prominent, truncate, with a central perforation. The sporidia, which are shortly cymbseform, vary a little in size.

836. **Hypoxylon** glomus. *B.* <£ *C.*—Erumpens pulvinatum subangulare nigram; peritbeciis paucis ; ostiolis hie illic erumpentibus perforatis.

New England, Murray. No. 5698.Sprague. No. 6273.

Erumpent, pulvinate, somewhat angular, black, with a little red about the apex ; perithecia large, about five in each pustule. This is clearly a very distinct species, but the specimens are unfortunately old and without fruit.

837. Hypoxylon leucocreas. *B.* <$• *Rav.*— Parvum pulvinatum e peritheciis prominulis papillatum nitidum, intus niveum ; sporidiis parvis ellipticis.

On limbs of oak. Car. Inf. Kavenel. No. 1706.

Small, about 1 a line across, black, papillate from the projection of the perithecia; stroma snow-white; asci linear; sporidia in a single row, minute, elliptic, brown.

838. **Hypoxylon bicolo*.** *B. $• C.*—Irregulare undulatum placentaeforme granulatum, intus niveum.

Vermont. No. 5909.

Irregular, strongly undulated, an inch or more across, finely granulated, white within. This again is without fruit, but is a very distinct species.

* **Hypoxylon** enteromelum. *Scinvvin.*—On beech. Pennsylvania, Michcner.. No. 4354. Nova Scotia, Rev. J. D. Russell. No. 5901.

839. **Hypoxylon xanthocreas.** *B. $[C.*—Pulvinatum nigrum demum confluens e peritheciis prominulis papillosum ; stromate flavo ; ascis linearibus ; sporidiis uniserialibus ellipticis*

New England, Sprague. No. 5374.

At first distinct, pulvinate, then by confluence forming a mass half an inch broad, black, papillate from the projection of the minute perithecia ; asci linear ; sporidia uniseriate, elliptic, 0003 long. Differs from Montague's *H. endoxanthum.*

840. **Hypoxylon epirhodium.** *B. 8f Rav.*—Effusum tenue parvum nigrum ex ostiolis prominulis papillosum; ascis linearibus ; sporidiis elliptic uniseriatis.

Car. Inf. No. 3253. On branches of rose. Car. Inf. Ravenel.

Effused, thin, forming small black patches, about t\\ o lines across, papillose from the slightly prominent ostiola; asci linear ; sporidia uniseriate, elliptic. *.

* **Hypoxylon** twrbinulatum. *Schrvein.*—On beech. Pennsylvania, Michener. No. 4216.

* **Hypoxylon callostroma.** *Schrucin.*—On *Benzoin odoriferum,* Pennsylvania, Michener. No. 3959. No. 4346, on *Prinus verii-cellatus.* Alabama, Beaumont. No. 4619.

Sporidia oblong, '0004 long.

841. **Hypoxylon OTorsei.** *B.* <fc *C.*—Erumpens ; peritheciis magnis

congcstis rubiginosis; ostiolo papillseformi; ascis linearibus; sporidiis oblongis.

On alder. New England, Russell. No. 5936. Maine, Morse. No. 6277.

Erumpent; perithecia large, crowded, covered with rubiginous meal; ostiola papillaeform ; asci linear ; sporidia uniseriate, oblong, with one or two nuclei, -001 or more long, about ^ as much wide.

842. **Hypoxylon Blakeii.** *B. % C.*—Erumpens ; peritbeciis
minoribus congestis ferrugineis ; ostiolo papilljeformi; ascis lineari bus ; sporidiis oblongis.

On willow. Maine. No. 6303. '

Erumpent; perithecia ferruginous, much smaller than in the last, crowded ; ostiola prominent; asci linear; sporidia uniseriate, oblong, with one or two nuclei, -0008 long. In many respects resembling the last, but with smaller perithecia and sporidia.

* **Hypoxylon sassafras.** *Schwein.*—Car. Inf. No. 1889. Ravenel.

Sporidia oblong, -0008 long.

843. **Hypoxylon epiphaeum.** *B. $•* £—Per ith ecus paucis connatis e macula rubiginosa oriundis; ostiolo papilloeform ; sporidiis brcviter cymbaeformibus.

On *Magnolia glauca.* Car. Inf. No. 2437.

Perithecia few, crowded in the centre of a rubiginous spot; osti-olum papillseform ; asci linear; sporidia uniseriate, brown, shortly cymbajform.

***Hypoxylon xubiginosum.** *Fr.*—Car. Sup. No. 878. Texas,
C. Wright. No. 3693.

* **Hypoxylon subiculosum.** *Schwein.*— Car. Sup. No. 86, 176,
278, 309, 319, 321, 357, 384, 395, 423. Car. Inf. No. 4920.
Ravenel. No. 1707.

Sporidia shortly cymbiform, binucleate, *0005 long.

• **Hypoxylon gregale.** *Schwein.*—Car. Inf. Ravenel. No.
1329.

Perithecia ovate, rather acute, pulverulent; ostiolum papulae-form ; sporidia oblong, narrow, uniseptate, '0005 long.

• **Hypoxylon mammaeforme.** *Fr.*—Car. Inf. On *Cyrilla.* No.
952.

844. **Hypoxylon nucitena.** *B. $ C*—Peritheciis minutis nigris confluentibus tingentibus; sporidiis cymba?formibus biseptatis, medio fuscis.

On nuts of *Carya.* Pennsylvania, Michener. No. 4151.

Perithecia minute, crowded, forming an even stratum, pulverulent; ostiolum pnpilheform; sporidia cymbseform, biseptate, tl-e middle articulate, brown, or with a Jbrown nucleus, -0006--00057 long.

• **Hypoxylon investiens.** *Schwein.*—Texas, C. Wright. No.
3913.

REPRODUCTION IN *COPRINUS RADIATUS.*

By WORTHINGTON G. SMITH, F.L.S.

Plates 54 to 61.*

For the purpose of minute research into the vital phenomena of the Mushroom tribe, *Coprhius radiatus,* Fr., possesses many advantages over the other species of the large order to which it belongs. The first great advantage peculiar to *C. radiatus* is that it grows readily and abundantly on dung heaps from April to December, and it comes up equally well in town and country. The second point in its favour is that it is so small and transparent that every part can be quickly examined, and an entire plant kept under the covering glass of the microscope. The third advantage found in *C. radiatus* rests in the fact of its whole life being so exceedingly short that its entire vital functions are performed in a few days. Having these points in view, I have, during the whole of the present summer and autumn kept up a large bed of fresh horse-dung in my garden, and from tliis bed I have narrowly watched the growth of many generations of the plant I am about to describe.

A complaint is often made by persons unused to the microscope, and to the appearances of objects as seen by; its aid, that it is impossible to see the real objects as they are represented in drawings. To a certain extent this is borne out by fao% for a drawing is never meant to represent what may be accideiAhlly seen at one sitting, but is designed as a summing-up of all that has been seen during many hundreds of sittings. Any one looking for the first time through a good telescope at Jupiter's moons, Saturn's rings, or the planet Mars, might be a little disappointed in the apparent small-ness and lack of strongly marked outlines in the objects seen ; but this does not detract from the correctness of astronomical diagrams, which are only matured after many patient observations. No one expects to see the solar system as shown *p* a model, or the country as seen on a map.

It may reasonably be premised that the facts observed in connection with the life history of *Coprinus radiatus* will more or less apply to all the other species belonging to the Mushroom tribe ; but it would be impossible to make the observations here recorded on the more fleshy species, because, instead of days, these latter plants take months to mature. In *C. radiatus* generation after generation keeps springing up in almost daily succession, but in the more fleshy species, exclusive of *Coprinus* and *Bolbitius,* I am convinced there is, as a rule, but one generation in thayear. The *Agarics* of the autumn spring up from the mycelium formed during the fall of the previous year, and this

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.mycelium has rested in the ground for twelve months. In digging up old pasture ground, or the dead leaves of an autumn which has passed, mycelium in a resting state is invariably found. There is no such long rest with the mycelium of *Coprinus radiatus,* for so long as the weather is not too dry, too wet, or too cold, the fungus goes on perfecting itself day after day without ceasing. During hot, very wet, or frosty weather the spawn lies buried, and it rests in the warm, moist dung for short periods of time only.

Coprinus radiatus, Fr., is one of the dung-borne Agarics with a cap which measures from an eighth to one quarter of an inch in diameter, and this filmy pileus is supported on a stem, which on an average measures from a quarter to three-eighths of an inch or more in height (PI. 54A and 55A). The whole cap is a mere transparent film, and the fragile stem is like an atom of gossamer thread. A breath will totally break down and collapse every part of the plant, whilst a heavy dew or slight shower of rain will destroy a whole colony. These minute Agarics can only be gathered with the aid of small forceps, for if they are taken in the fingers they at once collapse, become liquid, and vanish. So little moisture does a single specimen contain that it is lost in tne moment or two consumed in taking it for examination from tne garden to the house. The young plants may generally be seen dotted over the dung, like in size to so many pins' heads (PI. 5[0I]v> and from this, the infant state, to maturity, the growth of the fungus is very rapid. At seven or eight in the evening nothing but immature plants can be seen (PI. 54c, D, enlarged 20 diameters) ; about eleven or twelve a rapid growth commences, and by two or three o'clock in the morning perfect maturity is reached. If the morning is moist the plants will remain in perfection till nine or ten o'clock, but if it is dry they will not last after five or six. On shady roadsides or in dark places the time required for growth may probably be a little more or less, but the present observations apply to the plants as found growing on dung in a light and open place.

To get a good view of *C. radialus* it is necessary to magnify it at least from 50 to 100 diameters; the nature of the stem and gills can then be made out, and all the individual component cells be clearly seen.

Mature plants are figured at E, F (PL 54), enlarged 10 and 20 diameters, the first showing the nature of the outer surface of pileus, with its furrows, and the other the lower or fruiting surface, with the nature of the gills, and the collar formed by them near the insertion of the stem. At G is shown the relative number of the basidia or privileged cells, which carry the naked spores, and at H the relative number anji position of other privileged cells, termed cystidia. To these latter bodies I shall presently refer more fully, and they are merely adverted to here that some idea may be ioimcd of their gre.it i nmbcr. At i is shown a transverse section

through the cap of the fungus, a short time before expansion (when the umbrella-like top is down), to show that the hair-like stem is hollow, and that the plant in infancy is enveloped in a complete veil or bag, the presence of which is shown by the ring of cells and hairs which forms the circumference of the diagram.

For a- proper comprehension, however, of this minute fungus much more than a superficial examination is necessary, and thefirst thing to be done in the way of dissection is to secure a good longitudinal section of the fungus from top to bottom, as shown in PL 55 (J)—this enlarged 35 diameters, at once shows the immense number of cells which go to make up one of the fugitive little plants belonging to *Coprinus radiatus.* By reference to the figure it will be seen that the stratum of flesh which forms the pileus is only six or seven cells in thickness, and the external surface is covered with a few hairs of different sizes (the remnants of the universal veil or wrapper) some of the smaller hairs being tipped with a gland. Another good vertical segmental section across the cap and gills will show the appearance of the plicato-radiate outer surface of the pileus to be caused by a series of cracks which are brought about by the necessarily sudden expansion of the cap, which act of expansion tears (in these positions) the component cells of the pileus apart, PI. 54E, and PL 55K. A transverse section through the fungus when in an infant state shows the commencement of these fissures, as at PL 54, i, and PL 55, L. The gills have no trace of a trama—the so-called trama being the cells which form the substance between the hymenium in the gills; if present this substance would be at M M., PI 55, but one of the characters of the genus *Coprinus* is that the gills have no distinct intermediate substance in the gills. In the plant under examination the lamella} or gills are free from, and form a .collar round the stem (PL 55, N), and are only about seven cells in thickness.

Good sections down and across this stem when young will show it (gossamer like as it is) to be piped or hollow from top to bottom (PL 55 o), and the hairs seen at the base (P P) are the torn remains of the.veil or wrapper which once held the edge of the pileus (Q) down to the base of the stem. In this figure several spores may be seen at the base, carried up amongst the cells of the stem. On looking at an entire plant of *C. radiutus* in this way under a low power of the microscope it appears to be formed of a few thousands of cells only, but if these cells are now measured and counted, which is by no means a difficult matter/it will be found that instead of thousands it really requires millions of individual cells to build up one of these minute plants which a breath destroys. The smallness and lightness of one fungus is such that it requires 150 specimens to weigh a grain, or 72,000 to weigh an ounce troy. In the type specimen of *C. radiutus* now figured there were 22,560,000 cells in its structure irrespective of the p, which numbered about 3,200,000 more. If all these cells

and spores are only equivalent to the hundred-and-fiftieth part of a grain, it follows that in an ounce of fungus cells there must be no less than one billion six hundred and twenty-four thousand millions of these bodies, exclusive of the spores. In a large Mushroom the cells would number hundreds of billions. Still more wonderful is the fact that each individual cell is furnished with a spark of life, contains water, protoplasm, and other material, and is capable of growth and assimilation.

The purpose of this essay is to demonstrate something of the life history of the minute but truly wonderful fungus now before us; and with this object in view it is not only necessary to use the higher powers of the microscope, but to patiently watch the fungus and its changes at every hour (almost minute) of the night and day and for several days in succession.

In the vertical section of one of the minute gills, as shown in PI. 56, ^magnified 150 diameters, the whole fruiting and reproductive surface of the fungus is seen at a glance. The nature of the furrows in the pileus (R)' is now perfectly clear, every cell being seen in position, and the remnants of the universal veil or wrapper are seen on the surface of pileus at s. Studded amongst the cells of the upper stratum of cap may be seen various brilliant crystals which belong to the ammonio-phosphate of magnesia, and ■vilnch crystals are taken up by the fungus from the manure on which it grows. Many dung-borne Agarics are covered with so-called micaceous particles, which, in many instances, doubtlessly aiise from the manure which supports the fungus. It is a matter of considerable difficulty to get a section like this, for if attempted clumsily no result will follow beyond a slight discoloration of the edge of the lancet; it is necessary to take the slice at the exact moment of maturity, and even then it requires the perfection of dexterity to cut the fungus properly, as the plant is sticky in all its parts. A fragment of the fruiting surface of a gill is shown at T.

To understand the vital phenomena of *C.iadiatus* it is necessary to comprehend the meaning of the bodies seen in Pis. 56 and 57. The whole fungus is built up of cells, which run parallel with each other (and at maturity are very long) in the stem (PI. 5Q), and which spread laterally, and then become more or less spherical in the pileus. When these cells reach the gills or fruit-bearing surface (hymenium, u u), a certain differentiation takes place in their functions. The majority of the cells remain simple, but certain other cells which are spiead over the gills with the greatest regularity assume a different nature, and produce spores. These cells aie called basidia (meaning small pedestals, v v, PI. 56 and 57), and the spores, or analogues of ovules or seeds| I nsidio-eporep, because they are carried on these little pedestals! The minute threads between the spoies and their pedestals are termed spicules or sterigmnta (literally props). Certain other

privileged cells (w w, PI. 56) are termed cystidia (bladders), and around these latter organs and their meaning the principal interest of the subject in hand will now centre. But let it be borne in mind as a preliminary fact of the utmost importance that at first the fungus is composed wholly of simple cells which show no differentiation; no differentiation in the cells is seen in infancy when the gills are first formed, but the privileged cells, known as basidia and cystidia, come only into existence and that simultaneously as the plants reach maturity. This differentiation I consider to be sexual the basidia being female, and the cystidia the male organs. When the contents of the basidia and cystidia are interchanged, the result is a return to another series of cells, which go to form a new plant. I am perfectly aware of the opinions which have been expressed by other botanists (and to which I shall return), but it is not so much my aim to make my observations accord with what others have said, as to record what I have seen myself, and to give my own interpretations of the phenomena seen, irrespective of what has been said or done before.

The first sign of differentiation in the simple cells of the gills, when the basidia and cystidia are about to be produced, is in the privileged cells becoming glossy, crystalline, and translucent; they both appear to secrete a material which makes them conspicuously brilliant. Each basidium then throws out four slender branches, the tips of which gradually swell and form spores. The cystidia (w) aiemore sparingly produced (for their number in this species see PL 54, H. and PL 55, Q), and at first cannot be distinguished from the basidia, though they are frequently larger in size ; they are commonly granular within, and are in many species, as in the one before us, crowned with granules, w (PL 57, x), but sometimes they bear four spicules, and this latter condition has led some botanists to consider the cystidia to be barren basidia, but that they are really cystidia with spicules is proved by the following fact, which I believe to be somewhat new. In moisture, as supplied by the expiessed juice of horse dung (or even distilled water) these spicule-bearing cystidia germinate at the four points of the spicules, and produce long threads, which bear at their tips the granules so frequent in typical cystidia (PL 57, Y). The cystidia are moreover furnished with spicules in the subgenus *Pleuteus.* The germinating cystidia are seen in several places at w, Pis. 56 and 57, and the granules at x, Y. On the top of PL 57 is seen a section of a gill with all the bodies in position enlarged 350 diameters, whilst on the lower part of the cut may be seen various germinating cystidia to the same scale as seen on the surface of a gill. The granules at Y, which are at first not capable of movement, are really spermatozoids possessed of a fecundative power, but to see this power brought into operation considerable care and patience and the higher powers of the microscope are requisite. In certain other of the Agaricini, the protoplasmic contents of the

cystidia are at times discharged from one mouth only, and that at the apex of the cystidium.

Before quitting Pis. 56 and 57, I may say that when a slice, as represented in fig. 56, is placed under a covering glass in a drop of water, all the cells totally collapse and perish, so that in three or four hours not a vestige remains, but the same drop of water which destroys the old cells instils life into the granules or spermatozoids, which after the lapse of a couple of hours begin to revolve, and ultimately swim about with great rapidity. These spemiatozoids attach themselves to the spores, pierce the coat, and discharge their contents into the substance of the spore. From twenty-four to forty-eight hours after this the spore discharges a cell which soon becomes free, and this is the first cell-of the pileus of a new plant which rapidly produces others of a like nature (z, PL 56). Now the same water which had the effect of immediately collapsing and destroying the old cells, has quite a different effect on the new cells as discharged from the fecundated spore, for the whole development of the new plant depends upon the constant presence of moisture, expressed juice of horse-dung being perhaps best. A spore unpierccd by the spermatozoids is shown producing a mycelium peculiar to itself, at A, PL 56.

A spore is commonly considered to have some analogy with a seed, but according to my views its analogy is rather with an unfccundated naked ovule without an embryo, unless the nucleus within the spore may in some way represent the rudimentary fungus; when the spores are formed within sacs or asci, the ascus bears some analogy with the ovary-- The cystidium, on the other hand, represents with its granules the anther and its pollen.

The six spores represented on the top of PL 58 are magnified 1,000 diameters, and each viscid spore, which is furnished with a nucleus lighter in colour, but with a dark outline, has been pierced and fertilised by one or more spermatozoids, whilst the unfertilised spore at A has burst at both ends, and produced a mycelium of its own. At B may be seen three spermatozoids which have burst after twelve hours in expressed juice of horse-dung, and which have also produced branching threads peculiar to themselves, reminding one of a pollen tube. It is quite possible that these latter threads may help to produce a new plant if they come in contact with the spores. The large figure at c is similar in nature to the group at z, PI. 56, and represents three fertilised spores which have burst and produced the first minute knot or'groups of cells of the cap of a new fungus. These eighteen cells took four days for their production, and the crystals belong to the expressed juice of the horse-dung in which they grew. The spermatozoids as here shown begin gradually to revolve after being kept in liquid for two hours, and the movements last for at least four days. At first these bodies are perfectly spherical, as at D when they merely oscillate, then they revolve slowly, and as time

goes on, a single turn of a spiral makes itself visible, and the bodies whirl round with great rapidity. At inteLTals the motion entirely ceases, and then, after a short lapse of time, the gyration is again continued.

Judging from the presence of the eddy round these bodies whilst whirling (E E, PI. 58) they are possibly provided with cilia, but from the extreme minuteness of the bodies themselves I have not been able to satisfactorily demonstrate their presence. The whirling of the spermatozoids is sometimes so strong that when they attach themselves to the spores they twist them round after the manner of the revolving oosphere in Fucus.

When the cells of the old parent fungus collapse and disappear in the water, their place is in less than two hours occupied by innumerable quantities of bacteria, vibriones and monads, which belong to the infusoria. In these two hours every cell of the piletis has generally vanished. Where these infusoria come from, or how they so speedily come into being, is difficult to say. They may possibly be present in a latent state in the juices of the fungus, but I have invariably found, when a single specimen of *C. radiatus* has been placed on a slide under a covering t^lass with a drop of water, and this, again, under a propagating glass, that as the millions of fungus cells quickly disappear, so millions of simple infusoria just as quickly come into being. It seems almost reasonable to believe that the fungus cells themselves become suddenly transformed, and reappear as simple infusoria; the change would not be quicker or more remarkable than the rapid production of the purple black spores from the crystalline and colourless basidia.

Be this as it may I have here engraved the abundant infusoria^ to the same scale as the cells. The tailless monads at F have a rocking Brownian movement, whilst those with tails, G, propel themselves rapidly about after the manner of minute tadpoles. These monads are liable (without care) to be mistaken for the bodies I refer to spermatozoids, from which they are, however, very different. The bacteria are represented at H H, with their various movements (indicated by dotted lines), either straight, zig-zag, or rapidly revolving on a central axis; when they so revolve they cause a miniature vortex amongst the monads and atoms. 1 have commonly seen one segment move from side to side, as at J, whilst the other segment remained quiescent. I have also seen them bud from the centre, and occasionally they occur with three limbs instead of two, radiating from the central axis. The vibriones are like vegetable screws, and are shown at K. The spores and infusoria neither collapse nor burst in boiling. As for the monads, vibriones, and bacteria, it can hardly be admitted that they are generated spontaneously from inorganic materials; my experiments rather point in the direction that they are only differentiated forms of already living cells. However this may be, my boiling has not

destroyed cither vitality or form, and those interested in the subject of spontaneous generation, may possibly read the result of the following experiment with interest. A dozen semi-decayed specimens of *C. radiatus,* swarming with minute infusoria, were boiled in a test tube for five minutes and then hermetically sealed at the highest point of ebullition. At the end of a month the tube was opened and a drop of its liquid contents at once placed under a cover glass of the microscope for examination. Spores, cells, monads, bacteria, and vibriones were all there, but the latter motionless and apparently dead. In fifteen minutes, however, they showed signs of life, and began to slightly move about, in thirty minutes the movements were decided in nearly every specimen seen, whilst in sixty minutes the infusoria darted about with almost the same energy as they did before they were boiled. For a better appreciation of the exact form and gyrations of the spermatozoids they are shown again at the bottom of PL 58, enlarged 3,000 diameters. At first it requires long and patient observation to make out the form of these bodies satisfactorily, but when the peculiar shape is once comprehended, there is little difficulty in correctly seeing their characteristic form. The difficulty is something like that experienced by beginners in separating very small and close double stars with a telescope ; at first, and sometimes for a long period, only one star can be seen, till quite suddenly the two are made out, and they are seen as two ever afterwards.

It is not uncommon to find the spores of other dung-borne fungi sticking to the specimens of *C. radiatus,* and it is quite frequent to find not only the spores but the perfect asci of certain species of Ascobolus sticking to the under surface, to which position they have been projected from the plants of Ascobolus growing on the dung. I have also seen the eggs of various mites, nematoid worms, &c, carried up amongst the cells, which quite accounts for larvae being found within the substance of apparently sound fungi.

In the works I am acquainted with there is no mention of the cystidia falling bodily out of the hymenium on to the ground, yet this is the case in several Agarics I have examined, and is so with C. *radiatus.* The spores naturally fall to the earth, and with them the cystidia, and it is upon the moist earth that fertilisation is generally carried out. All botanists will remember Hoffmann's observations, where he has indicated the passage of basidia into cystiilia, and his remarks on the upper surface of the ring which grows round the middle of the stem in- *Agaricus mvscarius.* In this latter position Hoffmann found a quantity of gelatinous knots, from which projected one or more oscillating threads, terminated frequently with a little head, which occasionally becomes detached My interpretation, of these observations is, that Hoffmann lighted upon the fallen cystidia on the upper burface of the ring where

they were throwing out threads. Hedwig made somewhat similar observations on the ring in Agaricus.

From the condition of the infant plant, as figured on the hymenium, PL 56, z, ajid PI. 58, c, it is easy to trace the young fungus through the various stages of its growth, as seen at PI. 59, where the figures are all enlarged 500 diameters, the lower group of cells shows a plant of seven days' growth in the expressed juice of horse-dung. In all these figures it will be seen that crystals and spores are carried up by the cells, and the lower figure conclusively shows that the first cells of the new plant are the large ones which belong to the pileus ; indeed, the hairs of the pileus, as here shown, are amongst the earliest cells produced, these hairs and the threads of the mycelium (which is always highly granular near the plant) are almost one and the same in character. In PI. 59 and in PL 60 the infant fungus resembles a Puff-ball, to which it indeed bears a certain natural[1] relationship. The whole plant in infancy is enveloped in a wrapper of cells, the fructification being entirely concealed within. In the lower figure on PI. 59 may be seen two spermatozoids which have burst, and K K K shows the cells of straw.

When the fungus has made about the number of cells represented on the bottom of PL 59, the growth cannot be carried any further beneath a covering glass. PL 60 represents on one side the elevation, and on fthe other the section of the very smallest infant plant it is possible to see with a lens"on the dung. The fungus represented is magnified 200 diameters, and the original was about half the size of a pin's head (see A A A sketch in margin). The nature of the bairy coating, which forms the veil, and the cells which are to form the future gills, are here clearly seen. This figure shows the fungus in its Puff-ball condition at the time when the cells are being actively produced. It contains °nly a small proportion of the actual cells which go to make up a perfect fungus, and represents probably a full week's growth from the spores. How it is the cells have an inherent property of build-mg themselves up into a particular design, no one knows any more than it is known how the fine spark of life is kept up in these cells from one generation to another.

The mycelium now grows in a radiate manner from the base of the young plant, just as a germinating seed throws up a plumule and throws down a radiclo. This mycelium being the produce of fertilisation is now capable, under certain conditions, of producing new plants on certain spots on the threads. Spores are now unnecessary, in the same way as fresh seeds are unnecessary where the creeping root-stock of Couch-grass is present. Or the mycelium [ma]y go to rest in the form of cords or thick threads, when >it is termed Rhizomorpha, or in the form of knots or bulblets, when it is called Sclerotia. A similar state of things is common in many perennial flowering plants, as Convolvulus sepium and Sagittami

sagittifolia, and they both at first arise from a seed in the same way as a Mushroom arises from a spore. In Mushroom spawn the grower gets a material similar in nature to the root-stock in Couch-grass.

PL 61 and last, represents, enlarged 120 diameters, *C. radiatus* a few moments before expansion, when nearly all the cells are present. Most of the cells here shown are, however, only about one-half the size they reach at maturity, and they are not all and every oiie produced till the exact moment of complete expansion, as I have ascertained by counting the cells of many specimens. This is not to be wondered at, for if the 22,500,000 cells which go to make up one of these minute plants require 14 days for their production, it follows as a necessity that the cells go on multiplying all the fortnight, night and day, at the rate of 1,114 to the minute. It takes about five hours for the spores to be gradually produced all over the hymenium—say from 5 to 10 o'clock in the morning—and as there are upwards of 3,000,000 spores to each plant, they, as a consequence, gradually appear upon the basidia or spore-bearing spicules at the rate of 100,000 *every* minute.

No sooner has the plant ariived at perfection than that very moment it begins to perish. I have demonstrated that the cells of the pileus and the hairs which form the veil are the first to appear, and so they are the first to disappear. The fine matted hairs which form the veil in PI. 61, B B B, are all torn asunder during the few moments consumed in the expansion of the cap, and at the moment of maturity the hairs vanish and the pileus is naked, which nakedness is the first sign of its decay. When the fragile little fungus has at length produced its fruit, and is prostrate and dying upon the matrix from which it sprang, then, as can be seen with patience under the microscope, the cystidia produce spermatozoids which are at first passive and then active; these pierce the spores and cause the discharge of the first living cell of the pileus of a new plant. It will be seen from these observations that *C. radiatus,* though one of the most minute and fugitive of all the Mushroom tribe, is yet as completely perfect in all its parts as any of the larger and higher species of Agaricus. It must not be supposed that these observations can be followed without close attention and the utmost patience. All the 3,000,000 spores of the fungus do not grow and make new plants, or the world would soon be covered with *C. radiatus.* For every spore that is fertilised and grows there are millions which necessarily perish.

On a dung-heap which will produce *C. radiatus,* other species, as *C. nycthtmerus,* &c, are sure to appear ; and not only do allied species come up in company with *C. radiatus,* but every intermediate form between one and the other may be gathered any morning. These latter plants belong to no species described as such, but are natural hybrids? doubtlessly produced by the spermatozoids of one plant piercing the spores of another. Amongst the larger

species of Agaricus similar forms are quite common, and they prove sore puzzles for those men who only want *names* for the fungi they find. I am convinced that at least three-fourths of the described species of the higher fungi have no claim to rank as true species, and that plants like Agaricus procerus, A. rachodes, and A. excoriatus, A. gracilentus, with others, are mere forms of one and the same plant with every intermediate link.

Van Tieghem has recently been working on this, species, and he has arrived at the conclusion that the fungus produces spores of different sexes. But to me it is quite unreasonable to imagine seeds or spores to be of different sexes. Known facts point quite in the opposite direction, and if sex is once allowed in seeds and spores, then we must be prepared to allow sex in pollen and sper-matozoids. A spore or ovule must be considered female, whilst un-fecundated or still in the ovary, but when once fertilised it combines both sexes, and cannot be other then hermaphrodite. A secondary colour, as- orange (which combines the red and yellow primaries), can never be red or' yellow. In dioecious plants the seeds are capable of producing either sex, and are not themselves male or female, and even the great fleshy root-stock of Bryonia dioica will be male in one place, and if removed to a different position be female. The Rev. M. J. Berkeley, writing of Coprinus *{Gardeners' Chronicle,* April 17, 1875, p. 503), says—" Late examinations of the spores of some Coprinus under germination seem to show that impregnation takes place at a very early period." ^

Now my observations show that this impregnation often actually takes place on the hymenium itself, the product being a single cell, which in the species now described rapidly developes into a new individual. The spore and spermatozoid may be considered as somewhat analogous with an-ovule and a pollen grain, or with what is seen in Chara; or like the escaped oosphore and spermatozoids in Fucus amongst the Algae.

I cannot attach much importance to CErsted's interesting paper on the fructification of the Agaricini. His notes are on *Agaricus variabilis,* a plant he gathered from a Mushroom bed. • Now, as far as my experience goes, *A. variabills* is peculiar to dead stems, sticks, and leaves, and does not grow upon dung. Moreover CErsted experimented upon threads of mycelium taken from dung, and presumed only to belong to this Agaricus ; but this mycelium was quite as likely, in my opinion, to have belonged to fifty other things. De Bary, speaking of CErsted's observation says—" It is impossible not to perceive the similitude between the phenomena seen by M. CErsted and those I have described in *Peziza con-fluens"* It is quite doubtful whether or not OErsted had got the niycelium of some dung-borne Peziza for his experiments, as -P. *vesiculosa,* which is always present on dung-heaps.

In the observation of natural phenomenon it is never well to follow, without thought and original observation, in the footsteps of

others. In the case of *Peronospora infestans,* because De Bary said the resting spores were not likely to be found in the Potato plant, itwas almost universally accepted as a fact that they never could be there found. Because conidia had not been described, it was commonly believed that no conidia existed. The mycelium of Peronospora has till lately been described as always destitute of suckers, but in some of the Chiswick plants the suckers were abundant. The same fungus is commonly described as having its threads without articulations or septa, but it is equally common to see the figures of this fungus with septa in profusion.

Many botanists, as Corda, Bulliard, Klotzsch, and others, have considered the cystidium in Agaricus to correspond in some way with an antheridium, but as these views have not at-present been favoured by Tulasne and De Bary, many botanists seem disposed to agree with De Bary in regarding the cystids as mere " pilose productions of a particular order," which is very indefinite, and the granules as mere conidia (Tulasne). Klotzsch and others have considered it possible that the spores are fecundated by a lubricating fluid given out by the cystidia. This fluid is evidently the same with the threads observed by me, and which at length gives birth to spermatozoids. I consider it quite possible that the mere contact of the threads (or fluid) from the cystidia with the threads from the uiipierced spores may be sufficient for the production of a new plant. But De Bary, in criticising Klotzsch, says an opinion of this nature is entirely gratuitous, and the contact and its result, if real, would represent nutrition rather than fecundation, and, as far as he knows, there exists, he says, no oftier observation on any female organ susceptible of fecundation by the cystidia. I cannot fall in with De Bary s views at all, especially after the analogy found in Fucus and in the confervoid pollen (which has no outer coat), and which exhibits rotation in the flowering plants found under Zostera, Phucagrostes, &c, and which are fecundated when in a state of immersion in water.

As regards the spores of^ woody species of fungi, they are probably fertilised on the parent plant, and are blown away by the wind in a condition suitable to at once form the first cell of a new plant on any proper habitat. If Agarics were perennial and persistent, instead of being annual and fugitive, we might expect to see a new liymenium produced each year upon the lower surface of the old one, and this state of things really does exist in many species belonging to the perennial and persistent woody fungi of trees, where a new stratum of tubes is every year produced underneath the old one, so that the age of the fungus in years may be correctly ascertained by merely counting the strata. As to the mycelium itself, and the possibility of its producing sexual organs in Agaricus, I have had the subject before me for many years, and have seen many germinating spores, but no trace of any sexual organ other than the spermatozoids as pro.duced from the cystidia

themselves, or from the protoplasmic filaments which they throw out. I am therefore disposed to believe that the absenee of sexual organs on the mycelium is owing to the threads being the produce of fertilisation.

As for the expressed juice of horse-dung, it abounds with nema-, toid worms, spores, and infusoria of many kinds—no drop can be examined from a dung-heap after a shower of rain without seeing large quantities of these organisms. Therefore, any uncertain thread taken for examination from dung is sure to lead to error. All my experiments were carried out in duplicate, one with ex-pressed juice and the other with distilled water, with very little difference in result, as the new plant seemed to live principally on the remains of the old parent.

As a proof of how much there is still to be learnt respecting the life history of Agarics, I may say that in Sach's recently published *Text Book of Botany,* one of the very best and most complete books of its class ever published, there is no mentiou whatever made of cystidia in the description of Agaricus, and in La Maout and Becaisne's *Descriptive and Analytical Botany,* under fungi, it is stated that the male organs never produce antherozoids, and that the cystidia are always deprived of sterigmata or spicules.

To repeat and follow out these observations it is necessary to take the specimens for examination exactly at the proper period of growth, and to exercise the greatest care in securing an uniform moisture between the glasses. The life of the fungus is so short, find all the characters are so evanescent, that the points to be observed may be present one moment and all gone the next.

All the drawings have been made with a camera-lucid a, and from different specimens, so where the dimensions of the parts slightly disagree, it is only such a disagreement (within defined limits) as is commonly found in Nature.

REHM'S ASCOMYCETEN.—The sixth fasciculus of these specimens has just been received and contains, as usual, several new or other-wise interesting species. Any critical remarks must be postponed until we have had an opportunity of examining more minutely. It is, however, but justice to remark, that for size and quality of specimens this collection stands unequalled by any which have ever been issued in any country, although sometimes not in quite so convenient a form for the herbarium; this, however, is a fault "which can be remedied by transferring the specimens to flatter boxes.

BRITISH FUNGI.

By M. C. COOKE.

(Continued from page 39.)

Radulum deglubens. *B. <$ Br. Arm. N. H., No.* 1440.

Orbicular, ferruginous, bubdiaphanous; tubercles erect, sub-cylindrical, irregular, scattered, interstices even, pulverulent from the white spores.

On ash. Jan. Forres. New Pitsligo.

About £ inch across.

Radulum corallinum. *B. <£* Br. Ann. N. H., No.* 1441. Effused, white; subiculum shining, very thin, pelliculose; tubercles fasciculate, divided, obtuse, coralloid. Oak branches. Scotland. Effused for three inches; fascicles of tubercles \ or more across.

Radulum epileucum. *B. & Br. Ann. Nat. Hist,, No.* 1442.

Effused, ochraceous white, wholly resupinate ; subiculum snowy white, covered by a waxy stratum ; tubercles scattered, cylindrical, slightly fimbriate, deciduous.

On decorticated wood. Glamis.

Effused for several inches, tubercles falling out and showing the white mealy subiculum, round which is an annular depression.

Grandinia crustosa. *Pers. Fr. Epic. eel. it., p.* 627.

Floccoso-farinaceous, irregularly effused, crustaceous, adnate, >\hite ; granules somewhat rounded, crowded, obtiibe.—*Beik. $ Br. Ann. N.H., No.* 1443. *Nees Sys.f.* 247.

On *Polypoms versicolo?*\ Glamis. Feb.

Kneiffia subgelatinosa. *B. $ Br. Ann. N.H., No.* 1440.

Thin, yellowish then cream-coloured; granules minute, sub-gel atinose, fimbriate at the tips.

On stumps of felled firs. Glamis.

Accompanied by a green alga, which penetrates the tissue of the fungus.

Cratexellus clavatus. *Fr. Epic. ed. ii.,p.* 632.

Pileus fleshy, turbinate, truncate or depressed, flexuous, un-pol^hed, becoming somewhat yellowish, attenuated into a solid stem; hymenium even then corrugated, purplish then discoloured. —*Sverig. Ail. t.* 91. *Beth. $ Br. Ann. N. IJ., No.* 1445. *Krombh. t.* 45,/. 13-17.

In a beech wood. Bisham, Berks.

Cyphella fraxinicola. *B. $ Br. Ann. N.H., No.* 1446.

Minute, orbicular, externally snow-white, shoitly villose; disc yellow, becoming biownish with the spores, prolifeious. On ash. Batheaston.

Hyphelia rosea. ***Fr.*** *Sys. Myc.* ***Hi.*** 211.

Thallus radiating, white, pseudo-peridium flattened, pubescent, membranaceous, very fragile ; spores minute, glolose.—*Berk, 4r* ***Br. Ann. N. H., No.*** **1447.** New Pitsligo.

Clavaria curt a. *Fr. Epic, iu,* 668.

Small, very much branched, greenish-yellow; stem none ; branches short, crowded, obtuse.—5. *& Br. Ann. N. H., JXo.* 1448.

On the ground. Coed Coch. Holm Lacy.

Clavaria tubexosa. *Sow. Fung. t.* 199. ^

Simple, yellowish, attenuated at the apex, swollen in a bulbous manner at the base, attached by mycelioid fibrils.

On sticks. Forres (Rev. J. Keith).

• " Exactly the long lost plant of Sowerby, which is perhaps too near *C. ardenia ;* and possibly the same may be said of *C. ju*[nc]™> notwithstanding the great difference of size."—*B. & Br. N.* ii.[7] *Jan.* 1875, *pp.* 32.

Tricliobasis PrimulaB. ***Cooke Fungi Britt.il.,*** **JVp. 141.** *Uromyces Primula,* Lev. « Cooke Handbook, No. 1471.

Tricliobasis Iridis. ***Cooke Fungi Britt. ii.;Xo.*** **142.** *Uromyces Iridis,* Lev. " Cooke Handbook, No. 1466.

Tiichobasis Ulmariae. ***Cooke, Fungi Britt.il, No.*** **146.** *Uromyces Ulmarice,* Lev. " Cooke Handbook, No. 1461. These three species all clearly belong to *Trichobasis,* and not to *Uromyces.* The peduncles are very fugacious, to say nothing of other points of structure in which the affinities are decidedly with ***Trichobasis.*** >

Eustegia arundinacea. *Fr. Flench., ii.,* 112.

Erumpent, operculum collapsing, depressed, umbonate ; cups at first membranaceous, pallid, then black. Asci linear-clavate,
sporidia narrowly elliptical or subfusiform, straight, 1-2 nucleate, paraphyses copious, linear.—*Berk. $ Br. Ann. N. Hist., No* 1500. ***Stegia Arundinacea,*** **Fckl. Syn., App. 328.** ***Peziza Knmffix,*** **Walk,** Crypt.Fl. pp. 483 (not Rehm).

On reeds. New Pitsligo (Rev. J. Fergusson).

Sporidia *01 mm. long.

This is one of the plants about which much confusion[m] has gathered. Under the name of *Peziza Kneijfii,* specimens are found in some herbaria which are only forms of *Peziza fusca,* and Dr. Rehm has published in his Ascomyceten a very neat little *Peziza* under the name of *Peziza Kneiffii,* which is something very different. This is a true *Peziza* of the section *Dasyscypha* to which we have attached the name of *Peziza Winteri,* Dr. Winter having collated most of Dr. Rehm's species. Specimens of *Peziza Kneijjii* from the late C. Montagne, of *EvsUgia arundinacea* from Fries, and also from Mongeot, are all, with slight variations in the size of the pporidia, intrinsically the same.

Hysterium (Lophodeimium) arundinaceum. *Schrad. var.* g»a-

mineum.

II. culmigenum, var. *p.* Fr. Sys. Myc, ii., 591.

On leaves of grass. Forres.

Var. **culmigenum.** *Fr. Cooke Fungi Britt.,* i., *No.* 459.

On sheaths of reed.

Nectxia citrino-aurantia. *Lacr. Orevillea, ii., p.* 1G4. *Berk. $ Br. Ann. N. II. No.* 1492, *t.* 2, f. 8. On willow twigs. Batheaston. Dec. Sporidia obloug (-0003--00035 in.) '0075--0085 m.m.long.

Sphaexia (Villosae) mexnbranacea. *B. <£• Br. Ann, N. H. No.* 1493, *t.* 2/. 9.

Semi-immersed, perithccia large, membranaccous, clad with short flexible hairs; sporidia shortly fusiform, uniseptate. On very rotten wood. Langridge. Ap.

Sporidia (-0015 X '0007 in.), -035 X '0175 m.m., accompanied by a minute flask-shaped *Sphceronema,* with a long slender neck and minute globose spores ; probably its stylosporous state. *B. fy Br.*

Venturia Alchemillae. *B. $ Br. Ann. N. H., No.* 1493.*

Perithecia minute, crowded in small stellate spots, asci short; lanceolate ; sporidia fusiform, uniseptate.—*Asteroma Alchemillce. Grev. Fl. Ed., p.* 369. *Stigmatea AlchemjllcB^ Cooke Handbook, No.* 2796. *FckL Symb. Myc.,p.* 96. *Fckl. Fungi, Rhen, No.* 425. On leaves of *Alchemilla.* Sporidia (-0005 in.), "0127 m.m. long.

The following species are also figured on Plate 48, fig. 7; *Dendryphium ramosurn, C.*$_9$ Plate 49, fig. 1; *Puccinia malvacearum,* 2. *P. Polygonoimm;* 3. *P. Lychnidearum;* 4. *P. Alcehringice;* 5. *P.violarum;* 6. P. *Umbilici', 7. P. Saniculce* ; 8. *P.Primulce* 9. *P. compositarum*; 11. P. *Prunorvm*; and 12. P. *Tunaceti,* all X 500 (see scale).

Thelephora intybacea. *Fr. Epicr. ii.,* 635.

Coaspitose, soft, whitish then ferruginous—red, at length fuliginous ; stems somewhat lateral, growing together; pilei imbricate, fibrous, margin dilated, at first fimbriate and whitish, then entire and of one colour ; hymenium inferior, papillose, sub-floccose. *Pers. Syn., p.* 567 ; *Bull. Champ. U* 483 /. 6-7, *and t.* 278.

On the ground in woods. Glamis. Hev. J. Stevenson.

Exhibited at the Fungus Show at Perth.

Geastex Michelianus. ***B. Sf Br.***

Mr. WorthingtonG.^ Smith has expressed an opinion in the " Gardener's Chronicle" that *Geaster ciyptorrhynchus,* Kalch. figured and described by Professor Haz&linszky in this journal is identical with the above species. There is a slight difference'in the size of the spores in Hazslinszky'8 specimen and the *Geaster Michelianvs* found by Mr. Beech in this country, but that alone

w<Aild'iiot be sufficient to maintain thorn as distinct.

Badhamia fulvescens. *Coolie,*

Peridia sessile, subglobose, scattered, or 3-6 together, tawny-ochre, towards the base clad with a delicate white pubescence; spores pale brown, minute, ovate.

On old sacking. Dupplin Castle, Perth.

Spores (-0003 in.) -0075 m.m. diam.

The cysts investing the spores are quite distinct. I am indebted to Mr. C. E. Broome for examining this plant, and he coincides in the opinion that it is undescribed.

Us **til** ago **intermedia.** *Schroter.*

Produced within the florets, violet-brown ; spores subglobose, ovate, or shortly elliptic, rather large; epispore minutely spinu-**lose.—*Schroter in Rabh. F. Eur. No.* 1696.**

On flowers of *Scabiosa.* Scotland. Rev. J. Fergusson.

The spores are larger and darker than in *V'. flosculorum;* in the latter being *01 m.m., and in the present species #015 m.m.

Isazia spumaxioides. *Coolie.*

Densely casspitose, white, palmate or infundibuliform; apex crispate, lobed, or serrate, attenuated downwards into a slender stem, more or less .connate; spores subglobose, minute.

On bark. Knowsley. Rev. H. Higgins.

A very curious and distinct species, not unlike *Spumaria alba* at a superficial glance, forming large patches an inch broad. Spores •004--005 m.m. diam.

Clasterisporium vermiculatum. *Cooke.*

Effused, forming a thin black stratum on the wood; mycelium creeping, branched or simple, septate, brown ; spores erect, often fasciculate, cylindrical-fusiform, dark brown, multiseptate, straight, curved or geniculate, obtuse and pale at the extremities. ("lB-^ m.m. long).

On oak wood. Hereford. Mr. Griffith Morris.

This interesting black mould is certainly congeneric with ***Clasterisporium caricinum,* Schweinitz, and resembles *Helmintho-sporium*** without flocci, the spores being seated on the mycelium. Another rather aberrant form we have received from J. B. Ellis, New Jersey, U.S., to which the name of *Clasterisporium subulatum*$_r$ C., has been given, in which the apices of the spores are subulate. ***Clasterisporium pedunculatum,* Pock, is = *Helminthosporium attefiu,-atum,* C. & P.**

Virgasporium.—Dr. Saccardo has pointed out that the genus characterised under this name in tC Grevillea" is identical with *Cerco-**spora,* Freis, and that *Virgasporium maculatum* is equal to *Cerco-**spora Rtstdce,*** Fckl. Sym. Myc. p. 353, and Fung* Rhen. No. 1632. Such being the case the other species will bear the name of ***Cercospora clavyta.***

(To he continued in next number.)

SYMBOLS AD FLOKAM MYCOLOGIC AM AUSTRALIA.

Publicatae per F. DE THUMEN.

I. H

YMENO1VIYCETES.

Determ.—C. KALCHBRENNER.

1. **Agaricus (Lepiota) excoriatus,** *Sciiff.* Fr. Hymenomyc. eur, p. 30. — Graceinere in locis aridis, leg. O'lShanesy. No. 117. Com. F.
de Mueller.

2. **Agaricus (Lepiota) p roc ems,** *Scop.* Fr. Hymenomyc. eur. p. 29.— Rockhampton, in Queensland, in regionibus calidioribus vulgaris, log. Thozet. Com. Miillcr.

3. **Agaricus (Lepiota) leontoderes,** *Berk, ct Br.*$_f$ in Fungi Ceylon (Linn. Soc. Journal of Botany xi).—Gracemerc in collibus aridis leg. O'Shanesy. No. 109. Com. Miiller. " Cape Orange." (Non tuto
dcterminandus.)

4. **Agazicus (Lepiota) clypeolarius,** *Bull.* Fr. Hymenomyc. eur. p. 32.—Gracemere in terra leg. O'Shanesy. No. 111. Com. de
Miiller.

5. **Agaricus (Lepiota) cheimonoceps.** *Berk, ct Cvrt.,* in Fungi
Cubenses (Linn. Soc. Journal of Botany x).—Rockhampton, in Queens land, leg. Thozet. No. 691. Com. de Miiller. " Cape white,
stipes hollow."

Habitus Agarici clypeolarii minoris. Pileus nmbonalus, 1" latus, mollis, tomentoso-pulverulentus, albus. Stipes deorsnm incrassatns, 1^" longus, albofurfiiracens. Annulus lacerus, disparens.

6. **Agaricus (Lepiota) granulosus,** *Fr.* Fr. Hym eur. p. 36.—
Rockhampton in Queensland, in terra, leg. A. Thozet. No. 714.
717. Com. de Miiller. Specimina nimis manca.

7. **Agaricus (Omphalea) scyphiformis,** *Fr.* Fr. Hym. eur. p. 159.— Graccmere inter gramina pascuornm log. O'Shanesy. No* 100.
Com. de Miiller. " From its pure whiteness and delicacy it appears like a little flower."

8. **Agaricus (Pleurotus) illuminans,** *Miiller.*—Rockhampton in Queensland, in ligno einortuo, leg. A. Thozet. No. 733. Com. de
Miiller.

Descriptioni Berkeleyi in Linn. Soc. Journal of Bot. xui. sat

convenit, sed-an phospboreus fiurit, non constat. Specimina etiam nimis manca.

.9. **Agaxicus (Pleurotus) corticatus,** *Fr.* Fr. Hyin. eur p 16G — Gracemere in truncis emortui^ leg. O'Shanesy. No. 118. * Coin dc Miiller.

Forma minor, pileo villoso, albo, annulo obliterato.

10. Agazicus (Hebeloma) nudipes, *Fr.* Fr. Hym eur. p. 242.—
Gracemere in terra nuda *leg.* O'Shancsy. No. 114. Com. de
Miiller. Dubius.

11. Agaiicus (Flammula) picreus, *Fr.* Fr. Hym. eur. p. 251.—
Rockhampton in Queensland, in tiuncis emortuis Encephalarti
Dennissonii, leg. Thozet Com. de Miiller.

12. Agaricus (Naucoria) anguineus, *Fr.* Fr. Hym. eur p. 2.">5.—Rockhampton, in Queensland, in terra, leg. A. Thozet. No. 715,
716. Com. de Miiller.

13. Agaiicus (Psathyrella) hiascens, *Fr.* Fr> Hym. eur. p. 314.—
ftockhainpton in Queensland, in pascuis, leg, Thozet. No. 710.
Com. de Miiller.

14. Agaricus (Psathyrella) disseminatus, *Pers.* Fr. Hym. eur. p.
31G.—Rockhampton in Queensland, in ligno putrido, leg. A.
Thozet. No. 707. Com. de Miiller.

15. Maxasmius Rotula, *Fr.* Fr. Hym. eur. p. 477.—Gracemere in
terra et ligno cmortuo, leg. O'Shanesy. No. 101. Com. de
Miiller. " Stipes black and shining."

1G. Marasxnius mfo-pallidus, *Kalchb.* nov. spec.—Gracemere in terra prope truncos, leg. O'Shanesy. No. 102. Com. de Miiller.

M. pileo membranaceo, convexulo, late umbonato ; umbone linea circulari terminato ; striatnlo, glabro, pallide rufescente (light reddish) ; stipite filiformi, glabro, pallido, basi mycelio albido affixo ; lamellis stipitem attingentibus, subconfertis, pallidis.

17. HKEarasmiiis rhyticeps, *Kalclib.* nov. fcspec. - Rockhampton in Queensland, in sarmentis Passiflorarum, leg. Thozet. No. 704. Com. de Miiller. (Agaricus mniatopodius Miiller ?)

M. pileo membranaceo, hemisphserico, mox expanso, rugoso-plicato, centro leviter papillate, glabro, *2"* lato, fusco-rufescente.; stipite carneo, capillari, velutino, l-l^"longo; basi insfitia albo-tomentoso, rufo-fusco vel sursum pallescente; lamellae 8-12, latius-cula?, ventricosa3, distantes, stipitem attingentes, alba3.

1^. Maxasmius calobatcs, *Kalclib.* nov. spec.—Rockhampton in Queensland, in foliis putridis Bougainvilleae, leg. Thozet. No. 707. Com. de Muller.

M. pileo membranaceo, ^-1" lato, leviter, umbilicato, plicato (in siccis), ferrugineo-fnscescente ; stipite corneo, fistuloso, capillari,

fiigricante, pro ratione longissimo 2-S'[7], ad basin institiam glaber-rimo ; lamellis paucis, latiusculis, pileo pallidioribus.

1^. Marasmius aciculaeformis, *Berk, et Br.* (Linn. Soc. Jour, of Botany x. .—Gracemere in ligno putrido, leg. O'Shanesy. No. 103. Com. de Muller.

Stipites dense csespitosi prohac specie characteristic sunt.

20. Canthaxellus aurantiacus, *Fr.* Fr. Hym. eur. p. 455.—Rock-"ampton in Queensland, leg. A. Thozet. No. 712. Com. de Miiller.

Pileo an gusto, vix depresso et stipite elato a typo differ t.— *Ag. Xeroto similis.*

21. Xientinus pergamenus, *Fr.* Fr. Symb. Myc. p. 37.—Gracemere in terra, leg. O'Shanesy. No. 112. Com. de Miiller.

22. **Xientinus Lecomtei,** *Fr.* Fr Ep. p. 388.—Gracemere in liszno emortuo, leg. O'Shanesy. No. 600. Com. de Miiller. Rock-
hampton in Queensland, leg. Thozet. No. 721. Com. de Miiller.
" Crimson colour."

23. **Lenzites betulina**$_{\gamma}$ ***Fr.*** var. **velutina,** *Berk.* Ann. of Nat. Hist. 3 843, p. 181.—Rockhampton in Queensland, leg. Thozet. Com. de
Miiller.

24. **Lenzites Berkeley!,** *Lcr.* Ann. Sc. Nat. 184fi, V. p. 121.—
Brisbane River, Queensland, leg. A. Thozet. Com. de Miiller.
Albo, pileo multizonato, zonis elcvatis, tomentosis. Conf. Fr. Symb. Myc. p. 45.

25. **Hexagona Xttuelleri,** *Bcrlt.* Linn. Soc. Jour, of Botany XIIT.—
Rockhampton in Queensland, in Eucalypto Crebra, leg. A. Thozet. No. 720. Com. de Miiller. Forma minor.

26. **Polyporus vapoxarius,** *Fr.* Fr. Hym. eur. p. 579.—Gracemere
in ligno emortuo, lrg. O'Shanesy. No. 106. Com. de Miiller.

27. **Polyporus xexampelinus,** *Kalclib.* nov. spec- Rockhnmpton
in Queensland, in truncis, leg. A. Thozet. Com. de Miiller.
JE. Coriaceis, contextu colorato. P. pileis subcroso-coriaceis, dense imbricatis, conchatis, villoso-glabratis, zonis plurimis con-centricis exaratis, purpureo-umbrinis. Contextus fulvus. Poris minhnisjTotundatis, a[i]qualibus, pileo concoloribus.

28. **Polyporus versicolor,** *Fr.* Fr. Hym. eur. p. 568.—Rockhamp ton and Brisbane River in Queensland, leg. Thozet. Com. de
Miiller. Ubique terrarum.

29. **Polyporus muxinus,** *KalcKb.* nov. spec.—Rockhampton in
Queensland, leg. Thozet. Com. de Miiller.
E. Coriaceis, contextu albo. Pileus scmiorbicularis, vel sub-reniformis, conchatus, vertice in stipitein spurium protractus, sub-tiliter tomentoso villosus, murinus vel subolivascens, zonatus, zonis in pileo calvescente, albis. Pori minuti, perbreves, passim in-tequalos, albi.

30. **Polypozus hixsutus,** *Fr.* Fr. Hym. eur. p. 567.—Rockhampton
in Queensland, leg. A. Thozet. Com. de Miiller.

31. **Polypozus chxysoleucus,** *Kalclib.* nov. spec.—Rockhampton in

Queensland, leg. Thozet. Com. de Miiller.

Inodermcus, stuposns. P. pileis effuso-reflexis, imbricato con-fluentibus, mollibus, villoᶜo-tomentosis, azonis, forma variis, circa niargincm tenuem uno alteroque sulco notati. Pori niediocres, prininm breves, alveolares, demum piofundiores, subrotundi, acuti vel e situ obliqui, canaliculati, ceterum 'inlegri, albido et demum ochraceo-aurei. Substantia mollis, floccoso-fomontaria, pileo prorsus concolor ochraceo-badeo.

32. Polypozus Eucalypti, *Kalchb.* nov. spec_ Rockharnpton in Queensland, in truncis Eucalypti, leg. Thozet. Com. de Miiller.

Placodermeus, e Suberosis. Pileo e carnoso suberoso, in nostro specimine deformi, tuberoso, velntino, tectu mollissimo, azono, opaco, lsevi, colore peculiari ex umbrino in badio, violaceumque vibrante. Poris minutulis, rotundis, ore integris~, roseo-pruinosis. Substantia aquabilis, purpureo-violacea. Specimen nostrum mon-strosum, sed characteres evidentes.

33. **Polypozus sanguineus,** *Mey.* Flora Essequiboensis, p. 304.—
Ins. Lord Howe, leg. ct com. de Miiller.

34. **Polypozus salicinus,** *Fr.* Fr. Hym. eur. p. 5(>0.—Rockhampton in Queensland, in fissnris truncorum emortuorum, leg. A- Tliozet. No. 736. Com. de Miiller.

35. **Polyporus leonotis,** *Kalchb.* nov. spec.—Australia (sine loco) in truncis, leg. et com. de Miiller.

E. Spongiosis, Funalibus, came colorata, juxta Polyporum Rheaden et P. leoniimm collocandus. P. pileis spongioso-carnosis, imbricato-concrescentibus, plano-convexis, strigoso-hirsutis, azonis, sed nonnunquain obsolete-sulcatis, saturate ferrugineo-fulvis, mar-gine obtusiusculo, repando. Poris minimis, rotundis, pallide cinnamomeis.

36. **Polypozus placodes,** *Kalchb.* nov. spec.—Rockhampton in
Queensland, leg. Thozet. Com. de Miiller.

E. Placodermeis, Lsevigatis. Pileus floccoso-suberosus, utrinque applanatus, subreniformis, tenuis, rigidus, leviter concentrice sul-catus, sublaccatus, verrucis multis obsitus, rnfcscenti othraceus, mtus obscurior cinnamomeo-umbrinus (necfulvus) ; poris minimis, brevissimis, ore rotundis, intcgris, griseo-cinnamomeis, demtim fuscidulis. Pondere levissimns ; fere seneo-nitens.

37. **Folypozus chilensis,** *Fr.* Fr. Symb. Mycol. p. 63.—Rockhamp ton in Queensland, leg. A. Thozet. Com. de Miiller.

38. **Polypozus fiabellifozmis,** *Klotzsch.* Fr. Epicr. p. 444.—Rock hampton in Queensland, leg. A. Thozet. Com. de Miiller.

39. **Polypozus gibbosus,** *Nees.* Fr. Epicr. p. 443.—Rockhampton
[2]n Queensland, leg. A. Thozet. Com. de Miiller. Certe licet
stipes dssit.

40. **Polypozus picipes,** *Fr.* Fr. Hym. eur. p. 534.—Gracemere in tmncis putridis, leg. O'Shanesy. No. 108. Com. de Miiller.

41. **Polypozus Tzicholoma,** *Mntg.* Fr. Epicr. p. 431.—Gracemere
Jog. O'Shanesy. No. 113. Rockhampton in Queensland, leg.
Thozet. No. 713. Com. de Miiller.

42. **Polypozus myclodes,** *Kalchb.* nov. spec—Gracemere, in terra

ad basin truncorum, leg. O'JShanesy. Com. de Miiller.

Mesopus, carnosus. P. pileo carnoso, fragili, irregulari, subre-pando, profunde umbilicato, fere infundibilifornii, superficie in-t e l i , ruguloso, obsolete villoso, alutaceo vel pallide fuscescente.

Stipite solido inasquali, obconico, in pileum dilatato, cum poris curtis, minutis, incequalibus, albido. Caro albo. Edulis videtur. (Myclos = caro vegetabilis.

43. Corticium nudum, *Fr.* Fr. Hym. eur. p. 655.—Rockhampton > in Queensland, ad corticein emortuam. Citri aurantiae, leg.Tbozet. Com. de Miiller.

44. Stereum lobatum, *Fr.* Fr. Epicr. p. 547.—Rockhampton in Queensland, leg. *A.* Thozet. Com. de Miiller. Forma minor.

45. Stereum Ostrea, *Wees.* Acta Nat. Cur. xm. Fr. Epicr. p. 547.— Rockbampton in Queensland, in truncis, leg. Thozet. Com. de Miiller.

46 Stereum nitidulum, *Berk.* Hooker, London Journal of Botany, 1843, p. 638.—Gracemere in terra, inter gramma, leg. O'tShanesy. No. 98. Com. de Miiller.

TREIKELLINI.

Determ.—C. KALCHBRENNER.

47. Guepinia spathulaxia, *Fr.* Fr. Epicr. p. 566.-Rockhampton in Queensland, in ramulis putrescentibus Citri aurantiai, leg. A. Thozet. No. 723. Com. de Miiller.

GASTEROMYCETES.

Determ.—C. KALCHBUENNER.

48. Mutinus papuasius, *Kalchb.* nov. spec—Rockhampton in Queensland, in terra, leg. Thozet. No. 722. Com. de Miiller.

M. peridio exteriori laxo, cum stipite gracili pallido. liecepta-culo ovoidao-oblongo, sublibcro, Iseviusculo, nigro.

49. Sclero derma strobilinuxn, *Kalchb.* nov spec.— Rockhampton in Queensland, ad vias, leg. Thozet. No. 683. Com. de Miiller.

S. peridio globoso-depresso, superius profunde areolato, riinoso et demum juxta rimas Ylisrumpente, glabro, pallido, areolis angu-latis, squamarum stroboli instar proinincntibus; stipite solido, siccitate fere lignco, dcorsum attcnuato. Sporaruin massa a stipite distincta, cinereo-fuscescens. Sporai globos?aj, verruculosa^, vix pellucidae, nigricantes.

50. Tulasnodea lepzosa, *Kalchb.* nov. spec. - Gracemere, in terra, locis aridis, leg. O'Shanesy. Com. de Miiller.

Habitus prorsus Tulasnodeae mammosoe, sed peridiuin furfure luride umbrino; demum secedenle obductum. Sporse minutae, vix

cchinulatoe, cum capillitio cdrneo rufescentes.

51. Bovista lilacina, *Mntg. et Berk.* Hooker, London Journal of Botany,]845 — Hockhampton in Queensland, leg. Thozet. No. 690. Com. de Miiller.

52. I.ycoperdon gemmatum, *BaisA.* El. p. 147.—(jlracemere, leg. O'Shanesy. No. 1 1 G. Com. de Miiller.

53. Lycoperdon pus ilium, x *BatscJi.* Cont. ii. p. 123.—Rockhamp ton, in Queensland, ad terrain, leg. A. Thozet. Com. de Miiller.

54. Polysaccum pisocarpium, *Fr.* Fr. Syst. Myo. Hi- p. 54.—
Rockhampton in Qneensland, in terra, leg. A. Thozet. No. 719. Com. de Miillcr. Forma minor.

55. Crucibulum vulgare, *Tul.* Ann. Sc. Nat. 1844., i. p. '90.—
Gracemere, in ramentis defossis, ranmlisque dejectis. leg. 0 Shanesy. No. 688. Com. de Miiller.

ASCOMYCETES.

Determ.—Dr. REHM.

***56.* Hypoxylon rutilum, *Tul.* Tul. Sel. Fung. Carp. ii. p.^ 38.—**
Rockliampton in Queensland, in ligno putrido, leg. A. Thozet. No. 697. Com. de Miiller.

Sporse hyalinse, dein fuscae, ovales, inaequilaterales, 1-2 guttatae, 9 m.m. long, 8 m.m. crass, uniseriales, in ascis cylindraceis, 75-78 m.m. longis. Paraphyses articulatae, evanidas. Jod apiceni ascorum dilute coerulescit.

57. Poronia GBdipus, *Mntg.* Ann. Sc. Nat. 1855, iii. p. 114.—Gracemere, in terra, leg. O'Shanesy. No. 96. Rockhampton in Queens land, in fimo equino, leg. A. Thozet. No. 727. Com. de Miiller.

58. Xylaria polymorpha, *Fr.* Nke. Pyr. Germ. i. p. 17.—Rockhamp-- ton in Queensland, in truncis putridis, leg. A. Thozet. Com. de Miiller.

UREDINEI.

Determ.—DE TUUMEN.

59. J&cidium Ranunculacearum, *JDeC.* Flore fr. yi. p. 97. Forma Ranunculi rivularis.—Port Phillip in Victoria, in foliis vivis, prsecipue radiealibus Ranunculi rivularis Banks. Leg. et com. de Miiller.

60. JEcidium Lobelias, *Thm.* nov. spec—Colac in Victoria, in foliis, petiolisque vivis Lobelia3 platycalycis F. Miill. Leg. et com. de Muller. ^

***M.* acervulis rotnndatis vel ovatis, dense gregariis, folia, petio-lesque fere occupans, ampullaceis, primo epidcrmide tectis, dermm Hlwis, ore eras, siusculo laevi, elato, ochraqeis ; sporidiis irregu-lariter globosis, vel varie rotundatis, 18-22 mm. in diam., episporio punctulato, laevi, pallide ochraceis.**

USTILAGINEI.

Determ.—DE THUMEN.

61. Ustilago urceolorum, *Tul.* Ann. So. Nat. 1847, vii. p. 86.—
New Zealand, in ovario Caricis sp. indeterminatas Com. de Muller.

XKETXOMTCETES.

Determ.—DE THUMEN.

62. Arcyria punicea, *Pers.* Pers. Syn. Fung. p. 185.— Kockhampton in Queensland, in ligno putrido, leg. Thozet. No. 699. Com. de Muller.

63. **Stemonitis fusca,** *Roth.* Roth. Flor. Germ. p. 448.—Rockhamp[1] ton, in Queensland, in tvuncis putridis, leg. A. Thozet. No. 681.
Com. de Miiller.

KYCEUA.

Detenn.—DE THUMEN.

64. **Xylostxoma Corium,** *Pers.* Pers Myc. eur. i. p. 93.—Melbourne, in trunco put^rido Eucalypti, leg. et com. de Miiller.

BLYTTIA MORKII, N. AB E. ONE OF THE FRONDOSE HEPATIC2E, A NEW SPECIES TO BRITAIN.

B. Morkii, N. ab E. Synopsis Hepaticarum. Hamburgi, 1844, p. 474.

Pallavicinia Morkii, Lindberg, sec. Carrington.

In July, 1874, at a considerable elevation on Ben Lawers, I met with this plant, not before known as British. It occurred in solitary plants, about half an inch long, furcate, with margins irregularly crisped and complicated at the apices, bearing no small resemblance in habit only, to forms of Fossombronia. I at once recognised this plant as new, and a member of the Blyttise from the male flowers, visible with the naked eye, so conspicuous from the lacerated leaflets, like those of our Sussex state of B. Lyellii. The Ben Lawers plant, like our B. Lyellii also barren.

The Sussex B. Lyellii from the Sand Rocks has long flat, or scarcely undulate fronds, and is gregarious.

Not being able to correctly determine the species of the Ben Lawers plant, I sent it to Dr. Carrington, who with his habitual kindness, pronounced it Pallavicinia AJorkii, sending also a specimen from Norway for cormparison. It is probable it will be found on other high Scotch mountains, if sought for.

The following extracts from Nees' Synopsis shew the position in the tribe, the nature of the inflorescence, and the variations of the fronds.

Hemicyclum, 2. *Frondosce.*

1. **Codoniae.**

Fossombronia. *lluddi.*
Androciyphia. *Nat. E.* (exotic).
Petalophyllum. *Gottsche.* Zoopsis.
Ilook.yfil. (New Zealand).

2. Diplomitricae.

Blyttia, Endlicher.

Lilyttia. Frons simplex aut bifida, costa media ante limbum apicis desinente, subtus radiculosa, praedita ; praeter costam

tenera et membranacea. Involucrum monophyllum, lacerum, prirno tenninale e costa frondis ortum, dein ad speciem dorsale. Pcrianthium tubulosum, capsula ovalis, elatercs decidui. In-florescentia mascula dorsalis, e costa oriens, foliolis laceris tecta. Antherae iilamente brevi suffultse. Vegetatio frondosa costata.

B. UfEoxkii. ***N. ah E.*** B fronde sessili, obovata retusa, involucri laciniis lobatis plicatis.

/S **contort a.**

Fronde brevi apice valde dilatata subrotundata, subinfundibuli-formi undato subcontorta.

Habitat locis alpinis et subalpinis Germanise Norvegiae.

B. Xiyellii. ***Endlicher.***

a major.

Fronde (subunciali) lineari explanata margine, subrepando hinc inde serrato leniter undulato, calyptra perianthium acquanto, squamis perigonialibus confertis laceris.

(3 **Flotoviana.**

Fronde (breviori) oblonga undulato lobata marginibus adscenden-tibus crenulatis, calyptra perianthio duplo breviore, squamis perigonialibus confertis laceris.

Habitat locis udis paludosis, caespitibus laxis.

B. Hibernica. *Hook.* N. ab E.

Fronde (unciali, quadrinnciali), sublineari dichotoma planiuscula niarginibus repandis lobalisve, calyptra perianthio breviori, squamis perigonialibus alternis ovatis ovalibus parce dentatis. Habitat ad saxa rivulosum montoium.

From the foregoing it will be seen the Scotch B. Morkii, and the Sussex B. Lyellii, are, as regards the fronds, the beginning and the end of the scale. But the first somewhat resembles B. Hibernica, utterly distinct though. Starting as B. Morkii does with a simple frond, ending with a crisped, contorted, complicated, frond.

The addition of Blyttia Morkii to the British Flora, makes it embrace all the European species of this group.

G. DAVIES.

Brighton.

NOTE ON *Lactarius Turpis.*—The cuticle and tissue contiguous to it, of *Lactarius turpis*, contains a red colouring principle freely soluble in **a** dilute solution of potash, to which it communicates a rich purple tint. The addition of a mineral acid to this solution causes the precipitation in an amorphous form of the red colouring matter, which reproduces the purple colour when treated with potash. This colouring principle i^not soluble in alcohol, nor in mineral acid. The latex, the spores, the flesh and the gills do not yield it. It seems to be analogous to similar colouring principles existing in lichens. C. J. MULLER.

LICHENOLOGICAL MEMORABILIA, No. 9. *By*

THE REV. W. A. LEIGHTON, B.A. Camb., F.L.S., &c.

NEW IRISH LICHENS.

In June, 1875, Mr. Larbalestier sent me collections of Lichens made by him in Connemara, a district of the west of Ireland, which has been hitherto scarcely at all examined with respect to Lichens. Mr. Larbalestier has most kindly included even the commoner species, which renders his communications still more valuable, as enabling us to add to our knowledge of their geographical distribution. Amongst them I detected the following, which I believe are new species, and communicated my determinations to Mr. Larbalestier (in litt.) the same month :—

1. Venrucaria succina, *Leight.*

Thallus fuscescent, thin, effuse, scarcely, if at all, surrounding the base of the apothecia ; apothecia numerous, large, amber-colour, hemispherico-conical, papillate ; perithecium amber-colour throughout, dimidiate, spreading at the base; epithecium minute, poriform ; paraphyses very delicate and slender; asci lineari-clavate; spores 8, colourless, broadly fusiform, 7-septate, large.

On rocks near the lake, Kylemore, county Galway (1875). *J\Ir. Larbalestier.* **Very rare.** н * -

The apothecia when wet become of a beautiful transparent amber-colour. Iodine has very slight, if any, reaction on the asci and spores. Its nearest ally would seem to be *V. illinita,* NYL.,but that bpecies differs in having a whitish thai!us, nigricant apothecia, the perithecium colourless in lower part and fuscous in the upper part, and iodine turning the asci and spores of a dirty deep brown, and is also a corticolar lichen. Our lichen differs also in the size and colour of the apothecia from *V. chlorotica*, which is associated on the same rock, and which has also smaller 3-septatefusiform spores.

2. **Lecidea excelsa,** *Leight.*

Thallus whitish, slightly shining, thin, effuse, areolato rimulose, subdiffiact, areola? plane and flat (K yellow, C yellow) ; apothecia bluish-black, large, innato-sessile' or sessile, plane or slightly concave, very slightly pruinose; margin thickish, prominent, darker; hypotheciuin nigro-fuscous ; paraphyses indistinct; spores 8, fuligineo-fuscous, oblong, 1-septate, small.

On the summit of Kylemore Mountains, county Galway. *Mr. Larbalestier* (June, 1875), rare.

3. **Lecidea livescens,** *Leight.*

Thallus^ white, granulose or granulato-verrucose ; granules scattered and dispersed (K— C pale - reddish) ; hypothallus very black and predominating ; apothecfia scattered, arising from the

hypothallus, subinrate or innato-sessile, roun.1 or angulari-dif-formed, concave, the disk or epithecium of a pale grey livid appearance, surrounded with a thick, prominent, black, entire or tiexuose margin ; hypothecium nigro-fuscous; paraphyses thick, apices .brown ; spores 8, colourless, linear-oblong, simple, very minute.

On the Doughruagh, Kylemore, county Galway. Rare. *Mr. Larbalestier* **(1875).**

4. Iiecidea nitescens, *Leight.*

Thallus white, thin, continuous, minutely and irregularly rimu-lose, eflfuse, indeterminate (K yellow, C yellow), often overspread, more or less, with a dark-brown alga ; apotliecia numerous, small, planoconvex, polished and shining, immarginate; hypothecium very thick, black; paraphyses distinct, but conglutinate, apices pale ; spores 8, colourless, oblong or linear-oblong, simple, moderate in size ; gelatina hyinenea I. fulvescent.

On rocks, Salrock Road,- Connemara. *Mr. Larbalestier* (1875).

CRYPTOGAMIO SOCIETY OF SCOTLAND.

The annual meeting of this Society has been held this year at Perth, and a detailed account of it having appeared in the " Gar dener's Chronicle" (October 9tb), it is unnecessary to repeat it here. A few remarks confined to the scientific aspects of the ex cursions aud show may, however, not be wholly out of place. The Fungus Inhibition in the City Hall, on the 30th and the 1st Nov., was, perhaps, the largest ever seen, as far as the number of specimens is concerned, since the Society seemed fully i\ solved upon a-" big thing" in the[1] way of a show. Of fresh and dried specimens we are informed that there were more than 150,000. These covered a space of some 3000 square feet. When, how ever, it is remembered that, except the dried specimens arranged against the wall, very little attempt was made at naming the specimens, it can well be understood that numbers could be accu mulated with less difficulty, and that though a" big show," it was not necessarily so perfect as it might, have been. As a means of restriction, it may be objected, that a much smaller number of specimens, accurately named and somewhat systematically arranged, would have been far preferable. Nevertheless, it was meant to be a *ll* big show," and it fully carried out the intention.

*

By dint of considerable perseverance the new and rare species Were found here and there amongst the different collections over the room. It would occupy considerable space to enumerate all the interesting specimens to be seen amongst so many thousands.

Species new to Britain included *Agaricus aureus,* Fr., or at least a form of it, which Fries at one time seemed disposed to consider a distinct species under the name of *Agaricus Hornemanni. Clavaria Krombholzii* was also there, and *Thelephora intybacea,* Fr., from Glamis. One of the most interesting additions to the British Flora was a branched *Xylaria*^ quite distinct from anything heretofore described *{X. Scotica,* C), which was found on a melon bed, and sent by Mr. D. Matheson, of Meiklouer. Amongst others new to science, may be mentioned *Peziza coprinaria* on cow dung, from Rannock, contributed by Dr. Buchanan White; a curious form of *Geoglossum,* with small hyaline sporidia, probably not specifically distinct, from the North American *Geoglossum microsporum.* To which may be added, amongst Dr. Buchanan White's contributions, either to the show or found since, *Ascobolus crenulatus,* Kar&t., *Ascoboius pilosus* (variety), and *Sphceria (Spororrnia) Notarisii,* Ces , all on grouse dung. During the excursion through the grounds of Dupplin Castle, on the 29th, upwards of 200 species of Fungi were seen and recorded. Of these the following are new :— *Peziza Comitessce,* C, a beautiful golden yellow little *Peziza* on a fallen tree ; *Hehtium scoparitmi,* C, on old and rotten twigs of broom ; an interesting little *Badhamia,* with pale brown spores, unlike anything hitherto described, and which has been named *Badhamia fulvescens,* C. ; and, for the first time in Britain, the *Peziza,* called by Fuckel *Bispora monilifera,* growing amongst the Toruloid *Bispora monilioides.* Unfortunately the rain soon after midday brought the exploration rather suddenly to an unwelcome close, 3 et sufficient had been done to prove that much more may yet be accomplished north of the Tay towards augmenting the catalogue of British Fungi. With such earnest workers as Dr. Buchanan White, of Perth ; the Rev. J. Keith, of Forres; the Rev. J. Stevenson, of Glamis; the Rev. J. Fergusson, of Brechin ; and the Rev. M. Anderson, of St. Andrew's, we may hope that the next twelve months will witness a considerable increase in the list of Scottish Fungi.

Next year's show is to be held at Kclso, which will be more convenient for English visitors, and Cryptogamists from the South would do well not to let such an opportunity pass without an effort to meet the Scottish Cryptoganrists. Enthusiasm is rather infectious, and a slight importation from the North would not do the southerners much harm. The influence of the Perth meeting on all who took part in it will probably be a long time in passing away.

PiLorHonoN FIBULA, *Tuck,*—Among specimens from Herb. Borrer given me by Mr. Mitten, I find a fragment of a Lichen, which appears to be the above, although it is too small to speak positively. It is from Vire, Normandy, ex Herb. Montagne, and is named Stereocaulon pileatum, Ach. This needs enquiry.

Brighton. * G. DAVIEB.

WOOLHOPE CLUB FORAY.

The annual Foray of the Woolhope Club was for nearly a week, from October 11th to the lGth, the excitement of Hereford. As usual a, number of mycologists met together from far distant parts of the country, and enjoyed the hospitality of their Hereford friends. Of course Dr. Bull was the centre of all energy, and he had left nothing undone to make this Woolhope meeting as successful as any of its predecessors. What a comparison do these Perth and Hereford meetings afford to the declining and flickering London meeting, which latter seems to be making a last " struggle for existence."

Amongst the friost interesting " finds " at the excursions of the week were *Agaricus (Armillarui) bulbiger,* a most distinct species in a small subgenus, now found in Britain for the first time. Rarities were represented by *Strobilomyces strobiliaceus, Sisto-trema confluens, Clavaria amethystina, Tremella epigcea, Russula aurata, Agaricus enckrous, Clavaria botrytis,* and *Hydmim dia-jihanum,* the latter new to Britain, as well as *Agcnicus maao-**rhiziis.***

The more minute forms of Fungoid life do not usually absorb much attention at these Forays and shows, but afterwards we gradually learn of new or rare additions having been made by stealth during the day. On this occasion Mr. W. Phillips found a little red *Peziza* identical with the *Peziza hu??iosa,* of Dr. Rehm, but not of Fries. Almost simultaneously the Rev. M. J. Berkeley found this species in Kent, and the name proposed for it is *Peziza constellatio,* B. & Br. Although found some time since, yet Mr. Griffith Morris exhibited for the first time a black mould clearly congeneric with Schweinitz's *Clasterispormm caricinvm.* It resembles the spores of an *Hehninthosporium* borne on creeping threads. Amongst other rarities of a minute kind were *Ascobolus viridis,* Curr. ; the interesting, but perhaps not rare, *Peziza tre-chispora;* the larger *Peziza succosa,* B. & Br. ; and a few such things as *Torrubia militaris, Hypocrea alutacea, Peziza ccesia,* a small spored variety of *Peziza Crouani*^ &c.

Altogether the Woolhope meeting was as complete a success as any of its predecessors. There was an equal amount of social enjoyment, a most excellent room for the display of the spoils (were it not unfortunately as dark as a cellar), private dinners and a public dinner, and last, but not least, considerable additions to our knowledge of rare species, with some very interesting acquisitions to tte British Flora. Pleasure, combined with science in a manner so harmonious and satisfactory, characterises the Woolhope Forays, and render them things worthy of remembrance for one half the year, and of pleasurable anticipation for the rest.

PARASITISM OR POLYMORPHISM—WHICH? "

BY W. PHILLIPS.

The little that is known of the life-history of the black moulds *(Demutice),* and the consequent value of any fact bearing" on the subject, however apparently insignificant, induces me to bring before your readers a curious growth that has recently come under my notice. On the stump of a decayed tree was growing a dark velvety fungus, covering a space of some inches, which, on removing a portion and placing it under the microscope, was seen to consist of a small forest of upright black stems, varying in length from *009in. to "lin., most of them bearing spherical or pear-shaped heads. Theie were at least three different species, intermixed and associated in such a manner as to suggest the question at the head of this note. The undergrowth (pi. 53, fig. 10 *a a)* consisted of nearly black unbranched threads, articulated at frequent intervals ; when seen by transmitted light, opaque at the base,-translucent towards the summit, as commonly seen in *Helmintho-sporia* (fig. 11). When young some of these threads were surmounted by a sphaerical head (fig. lla), which was a simple, thick-walled cell, containing a groumous, subtransparent protoplasm, which becomes at a later period dark brown, nearly opaque *(fig.* lie), in which state it might safely be referred to *Monotospora sphcerocephala,* B. & Br. Other threads were surmounted by oval heads passing through a similar change of density according to age *{fig*$_y$ 11 *b, d),* as the spherical ones.' These might be referred to *Monotospora megalospora,B.* & Br. A third lot of threads had heads differing from both those described, approaching a pear in shape *(fig.* 11 *e),* the dark brown contents being divided into three or four portions by broad septa. These may be referred to *Helminthosporium obovatum,* Berk. Now the question arises, are we to consider these three forms as distinct species, accidentally growing together, or one and the same species passing through these several forms ? If'we had found either growing alone there could have been little hesitation in naming it as above, but the idea is forced on us that when they are found thus intermixed, they may be different developments of the same species, tbe progression of which may be best seen by the arrangement (fig. 12 a, *b*$_y$ c, *d,* e), of the different heads according to age, taking the small transparent Rphscrical head :is the youngest, and the septate pear-shaped head as the most mature, the other forms being intermediate. A fact tending to strengthen this view is that nearly all the heads which had fallen on the matrix were the pyreform septate ones (fig. 12 *e).*

In addition to what I have just described as the under-growth, there were also seen thinly scattered taller stems, with

sphserical heads of a totally different structure (fig. 13), answering to *Stilbum rigidum,* P. The stem consisted of a densely coin-

pacted mass of fine threads, only distinguishable when crushed in water under the microscope (fig. 14), branching out at the summit, and giving off a vast number of minute spores too small, to admit of accurate measurement, which are held together by some glutinous substance forming the Bead *(fig.* 14 a). Extending up the stem, and branching from it at different intervals (fig 13 c, c), either as natural growth or parasitic growth, were what exactly corresponded to what I have called above *Monotospora sphcerocephala,* B. & Br. (fig. 15). I tried to trace some difference in the threads composing the stem of the Stilbum, but was unsuccessful, and I am -quite unable to say whether they exist or not. This association of growth of four different species appeared so curious m some particulars that I have thought it well to place the facts before your readers.

DESCRIPTION OF PLATE LITI.

Fig. 10.—A magnified group of black moulds X 75 linear, a, a, *Monototpora sphoerocephala,* B. &Br, *M. megalospora,* B. & Br., and *Helmintlio-sp trium obovatum,* Berk.
Fig. 11.—The same magnified 284
Fig. 12 —The heads in i he suggested order ^f growth
Fig. 13 —*Stilbum rigidum,* P , with *Monotospora sphoerocephala* growing from its stem X 75.
Fig 14.—The > ead of *Stilbum rigidum,* P. X 284-
Fig. 15.—One of the branches from *Stilbum riyidum,* magnified 284.

BRITISH LICHENS.

In the Journal of Botany for May, Mr. Crombie records the following additions to the British Lichen Flora: 1. *Pyrenopsis* ***phylliscella,*** **Nyl. sp. n> 2.** ***Collemopsls oblongans,*** **Nyl. sp. n. 3.** ***Collema tenulentum,*** **Nyl. sp. n. 4.** ***C. granuliferum.*** **Nyl. sp. n. 5.** ***Pilophoron st?iimaticu?h$_y$*** **Nyl. sp. n. 6.** ***Alectona sarmentosa,*** **Ach. 7.** ***Parmelia sulcata,*** **var.** ***Icevis,*** **Nyl. f.** ***hirsute,*** **Cronib. 8.** ***Physcia tribacoides,*** **Nyl. sp. n. 9.** ***Lecanora subexigua,*** **Nyl. sp. n. 10.** ***Lecanora leucophceiza,*** **Nyl. sp. n. 11.** ***L. austera,*** **Nyl. sp. n. 12.** ***L. subcinerea,*** **Nyl. 13.** ***L. cinerea,*** **f.** ***lepidota**** **Leight. J4.** ***L. fuscescens*** **(Smmrf.) 15.** ***L. Hischoffn (He))]>.)*** **16.** ***Pertusaria ocanthosto?na*** **(Smmrf.) 17.** ***I ecidea prasiniza,*** **Nyl. 18.** ***Lecidea lubens,*** **Nyl. sp. n. 19.** ***L. ocliracea*** **(Hepp.) 20** ***L. scopulicola,*** **Nyl. sp. n. 21.** ***L. jihylliscina,*** **Nyl. 22.** ***L. phylliscocarpa,*** **Nyl.** sp. n. 23. *L. dealbatvla,* Nyl. sp. n. 24. *L. sorediza,* Nyl.* 25. ***L. confuswr,*** **Nyl. sp. n. 26.** ***L. luteo-atra,*** **Nyl. 27.** ***L. neglecta,*** **Nyl. 2#.** ***L. advenula,*** **Lcight. 29.** ***L. vrceolata,*** **Ach. 30.** ***Xy-lographa laricicota,*** **Nyl. sp. n. 31.** ***Ptychographa xylographoides,*** Nyl. sp. et gen. n. 32. *Arthonia pvnctiliformis,* Leight, sp. n. **33.** ***Alelaspilea veivnfoimis,*** **Leight, sp. n. 34.** ***Thelocarpon superellum,*** **Nyl. 35.** ***Verrucaria fluctxgena,*** **Nyl. sp. n. 36.** ***Obryzum corniculatum,*** **Wallr. 37.** ***Endococus triphractoides,*** **Nyl.** sp. n.

*** This = Mudd exs. n 181 not *L subconfluens,* Th. Fr. Scand, p. 487 (excl. oyn. Mudd), which is sufficiently distinct.**

ON A NEW BHITISH SPECIES OF ASCOBOLUS. BY W. PHILLIPS, F.L.S.

Aseobolus amethystinus, N.S.—Sessile, scattered, at first sphse-rical, then expanded, concave, externally dark purple, verrucose; disc nearly black ; margin serrated ; asci sub-cylindrical; sporidia 8, elliptical, rather narrow at the ends, hyaline, becoming purple, coarsely verrucose ; paraphyses simple, enlarged at tbe apices.' Sporid -0011 X -0006 in.

On damp sandy-soil on tbe margin of the river Severn. Shrewsbury. Oct., 1875.

This beautiful species in its early condition is perfectly sphaerical, without any trace of a" pore at the summit, it then becomes fractured by an irregular aperture, which gradually expands, leaving rather a thin serrated margin to the cup. The cells composing the exterior are of a beautiful amethyst purple under the microscope, and when pressed xyeild their coloring matter to surrounding objects. The cups attain a diameter of half an inch.

This species is near *A. atrofuscous,* but differs from it in the receptacle being purple, the sporidia narrow at the ends and more coarsely verrucose, the asci being sub-cylindrical and the paraphyses enlarged at the summits, beside other characters given above.

ELVELLACEI BRITANNICI.

By W. PHILLIPS.

The second Fasciculus just issued contains :—

51. Morchella semilibera, *D.C.* 52. Verpa digitaliformis, *Pers.* 53. Mitrula cucullata, *(Batsch.) Fr.* 54. Geoglossum viride, *Pers.* 55. G. glabrum, *Pers.* 56. Rhizina undulata, *Fr.* 57. Peziza trachycarpa, *Curr.* 58. P. Chateri, *Sin.* 59. P. macro-cystis, *Cooke.* 60. P. semi-immersa, *Karst.* 61. P. coccinea, *Jacq. 62.* P. lanuginosa, *Bull.* 63. P. sepulta, *Fr.* 64. P. scutellata, *L.* 65. P. imibrata, *Fr.* 66. P. resinaria, *Cooke fy Phillips.* 67. P. clandestina, *Hull.* 68. P. palearum, *Desm.* 69. P. trichodea, *Plow. #. Phill.* 70. P. controversa, *Cooke.* 71. P. luzulina, *Phillips.* 72. P. flammea, *A. $ S.* 73. P. escharodes, *B. #• Curt.* 74. P. ulmavise, *Lusch.* 75. P. villosa, *Pers.* 76. P. coesia, *Pers. 11.* P. fusca, *Pers.* 78. .P. firma, *Pers.* 79. P. cyathoidea, *Bull.* 80. P. solani, *Pers.* 81. P. hepatica, *Batsch.* 82. P. fusaroides, *Berk.* 83. P. ulcerata, *Phillips.* 84. P. arenevaga, *Desm.* 85. P. viburnicola, *B.* <$• *Br. 86.* Helotium aeruginosum, *Fr.* 87. H. herbarum, *Fr. 88. H.* epiphylhnn, *Fr.* 89. H. pruinosum,-*Jerd.* 90. Patellaria atrata, *Fr.* 91. P. rhabarbarina, *Berk.* 91. P. discolor, *Mont* 93. Tympanis ligustri, *Tul.* 94. Oenangiuin subnitidum, *Cooke $ Phillips.* 95. Aseobolus vinosus, *B.* 96. A. glaber, *Pers.* 97. A. ciliatus, *Schm.* 98. A. testaceus, *B.* <$• *Br.* 99. Stictis graminis, *Desm.* 100. Stictis seriata, *IAb.*

HEPATICiE IN HIBERNIA, MENSE JULII, 1873.

Lectaa a S. O. LINDBERG. Acta

Societatis scientiarum fennicse, x, p. 467—559.

That any one on their first visit to a country should, in a few weeks, collect so many as 87 species of Hepaticse, may certainly be looked upon as remarkable, but still more exceptional is it to find recorded a critical notice of every one of these, with elaborate Bynonymy, and structural details devised from careful dissections. All these, however, are given in the paper before us, and with a clearness and precision that stamp it at once as the work of a master mind. Nor is this all, a new arrangement of the order is brought forward which we transcribe entire, as being likely to prove a useful guide to students in these interesting plants, especially as many may not have an opportunity of consulting the original.

The whole are divided into three families, and these are sub-divided into *SchizocarpcB* and *Cleistocarpce* according to the nature of the fruit. The great group of *Jungermaniacece Schizocarpce* is again broken up into the following sections :—

a. Anomogamae.

Prothallium disciform, producing a plantigenous bud from the margin. Stems more or less regularly pinnate, twice or thrice compounded, more rarely dichotomously branched. Leaves incu-bous, never opposite nor connate, conduplicnte, the front lobe round, ovate or rarely ovate-lanceolate, entire, sometimes toothed, ciliate or more deeply emarginate, very rarely sublobulate, the hinder lobe smaller, saccate, galeate, cucullate or flattish, rarely somewhat indistinct, with some minute, irregular, commonly styliform lobules frequently placed between the hinder lole and the stem. Amphigastria round ovato-rectangular, entire,, bi-lobed, many-cleft, or sometimes with galeate lobes, rarely none. Gamoecium dioicous, autoicous or much more rarely paroicous. Perichaetiuni apical, or proceeding from the posterior face of the stem, next its side above the axil of the leaves as a proper ramulus, never from the axil of the aniphigastrium. Pistillidia usually verj few. Colesula commonly small, 5-plicate and sometimes winged or compressed, rarely terete or densely plicate, with the mouth often very narrow and beak-shaped; rarely none. Seta ʳery short, or short, slender. Theca minute, globose, almost always very thin, and pellucid, as if composed of very few strata, most frequently cleft to the middle, and with erect valves, shewing internally few or no spiral fibres. Elaters .one- or two-spired, sometimes scarce, spirally thickened, adhering pencil-like to the apex of the valves or to the interior face of the theca. Spores minute, rarely large, smooth or nearly so. Androecia* lateral to

the stem like the perichastia, antheridia two or solitary, fixed in the axils of semiglobosely concave bracts, rarely in the axils of leaves or perichaetial bracts, the foot stalk commonly arcuato-curved, paraphyses none. Propagula rather large, almost always disci-form, arising from the leaves.

b. Homogamae* ,

Prothallium shortly filiform, entire or branched in the frondose forms, bulbiform-subglobose. Stem irregularly branched, with branches from the amphigastrial axil, or with innovations more or less approximate to the colesula, rarely dichotomous, pinnate or twice compound. Leaves succubous or incubous, sometimes opposite and connate, very rarely conduplicate and then almost always the front lobe is smaller, as to form highly variable, round or reniform to sublinear, quite entire to broken up into filiform segments. Amphigastria narrow, more or less ovato-lanceolate, rarely round, quite entire to broken up into filiform segments, not unfrequently none. Gamoecium dioicous, paroicous or much more rarely autoicous. Perichsetium passing out from the amphigastrial axilla as a proper branch, either apical on the stem itself, and its innovations, or in very many frondose forms, fixed on the interior face, more or less below the apex of stem, sometimes saccato-dependent. Pistillidia commonly very numerous. Colesula usually large, three or five plicate, very rarely winged, sometimes compla-nate or compressed, sometimes terete or densely plicate, with the mouth more or less wide, hardly ever beak-shaped; not unfrequently none. Seta long or very long, often thickish. Theca large globose-cylindric, of thick texture, brown and not pellucid, as if foimed < f at least two strata; cut down to the base, with the valves patent or divaricate, almost always showing spiral fibres internally. Elaters two—rarely one—tri, or quadrispiral, adhering to the internal face of theca, very rarely to apex of valves, or free. Spores minute or rather large, sometimes appendiculate externally. Androeeia proceeding from the amphigastrial axilla as perichaetia, or antheridia, commonly two, more rarely more or one, in the axils of the uppermost leaves, or in the frondose forms, fixed over the anterior face of the stem or immersed in it; the footstalk straight, hardly ever arcuato-curved, paraphyses sometimes present, usually filiform. Propagula minute, globose or angnlar, formed of one or few cells, arising from the leaves, amphigastria or apex of stem, very rarely large, more or less globose, and immersed in the frond.

f Opisthogamae.

Stem irregularly branched by bifurcation of apex, or with branches fiom the amphigastrial axillae, sometimes pinnate or twice compounded. Leaves incubous or succubous, very rarely conduplicate, entire or lobed. Amphigastiia present at least in the perichajtium of all, very like the leaves, or more or less ovate, undivided or lobed. Gamoecium dioicous, autoicous, rarely

paroicous. Female shoot proceeding from the amphigastrial axilla, almost always short. Colesula triangular, very rarely terete, compressed or none. Antheridia on a proper branch proceeding from the amphigastrial axilla, hardly ever placed in the foliar axillae of the stem itself, paraphyses none.

f f Acrogamae.

Stem commonly branched by innovations proceeding Irom beneath the perichsetium, rarely pinnate or dichotomous. Leaves succubous, sometimes conduplicate, entire to broken up into capillary segments. Amphigastria most frequently absent, commonly small and ovato-subulate, rarely larger and like the leaves, undivided to broken up into capillary segments. Gamoecium dioicous or paroicous. Perichsetium apical on the stem itself and its innovations. Colesula terete, commonly five—or sometimes more densely plicate, not unfrequently compressed, very rarely none. Antheridia placed in the highest axils of the stem and innovations, paraphyses present in some, most frequently leaf-shaped.

EUROPEAN GENERA OF HEPATICJE NATURALLY ARRANGED.

X. IVIARCHANTIACE-ffi.

A. ScHIZOCARPuE.

***a* MABCHANTIE^.**

1. Marchantia, *March.—F.t L.*
2. Preissia, *Corda.*
3. Conocephalus, *Hill.*
4. Fimbriaria, *Nees.*
5. Duvalia, *Nees.*
6. Asterella, *P.-B.*
7. Dumortiera, *Nees.*
8. Sauteria, *Nees.*
9. Clevea, *Lindb.*
10. Aitonia, *Forst.*
11. Lunularia, *Mich.*

/3. TARGIONIEiE.

B.

12. Targiouia, *Mich.*

***y* CORSINIE-ffi.**

13. Corsinia, *Uaddi.*
14. Tesselina, *Dum.*

***6* RlCCIE(E.**

15. Riccia, *Mich,*

11. JUNGERMANZACEJE.

A. SCHIZOCARP^E.

a. *ANOMOGAMJE.*

***a* FRULLANIE-ffi.**

16. Frullania, *Raddi.*
17. Lejeunea, *\Lib.*
18. Radula, *Dum.*

i

19. Porella, *Dill.*
20. Pleurozia, *Dum.*

***(3.* METZGERIE.E.**

21. Metzgeria, *Raddi.*

b.

•)".

HOMOGAMM.

y LEPIDOZIE-E.

22. Lepidozia, *Dum.*
23. Bazzania, *B. Qray.*
24. Odontoschi^ma, *Dum.*
25. Cephalozia, *Dum.*
26. Lophocolea, *Dum.*
27. Pedinophyllum, *Lindb.*

28. Ohiloscyphus, *Coreda.*
29. Harpanthus, *Nees*.

8 SACCOGYNE-S:.

30. Kantia, *B. Qray*.
31. Saccogyna, *Dum.*

c RICCARDIE^:.

32. Riccardia, *B. Gray*.

f *Acrogamce,*

£ BLEPHAROZIE^:.

33. **Tricbocolea,** ***Dum.***
34. **Blepharozia,** ***Dum.***
35. **Mastigophora,** ***Nees.***
36. **Herberta,** ***B. Gray.***
37. **Anthelia,** ***Dum.***
38. **Blepbarostoma,** ***Dum.***

fj

39. JUNGEBMANIE^.
40. **Martinellia,** ***B. Gray.***
41. **Diplopbjllum,** ***Dum.***
42. **Plagiocbila,** ***Dum.***
43. **Mylia,** ***B. Gray.***
    Soutbbya, ***Spruce.***

44. **Jung ermania** ***(Rupp) L.***
45. **N a r d i a ,** ***B .*** ***G ray.***
46 **Cesia,** ***B. Gray.***

9 ACROBOLBE-E.

47. **Acrobolbus,** ***Nees.***
48. **Calypotfeia,** ***Raddi.***

I FosSOMBRONIE-fflJ.

49. **Scalia,** ***B. Gray.***
50. **Fossombrouia,** ***Raddi.***
51. **Petalophyllum,** ***Gottsche.***
52. **Pallavichiia,** ***B. Gray.***
53. **Blasia,** ***Mich.***
54. **Fellia,** ***Raddi.***

CLEISTOCARPJE.

*■ THALLOCA' *TEM.*

57. **Thallocurpus,** ***Lindb,***
55 **Durieua,** ***B. M.***
. **Spbgerocarpus,** ***Mich.***

XXX.

ANTHOCEROT ACE JE.

a. ANTHOCEROTEJE.

58. **Adtboceros,** ***Mich.***
59. **Nototbylas,** ***Sull.***

As an appendix is given a revision of the European species of *Rhacojnitriuni,* and also the description of a new species ot *Zygodon* as follows :—

Zygodon aristatus.—*Lindb.*

Dioicous, branched,, sparingly radiculose; the leaves dense, erecto-patent, straight or a little recurved at apex, somewna carinate, elongato-lanceolate, the wings at apex of unequal leng , that of one side (usually the left) running higher on the nerve, the margin crenulate by the minute papilla; nerve yellow, tnic , strongly prominent at back, excurrent as an arista, which is long,, very thick, subterete, pungent, fragile and quite smooth above , cells pleuren chymatous, quite smooth, but at the extreme ape oblong—oval, and slightly papillose, all rather large and strong y incrassate, the basal oval—rectangular or—quadrate,, quite smoo i, the others roundish, bearing at the thickened circumference short acute papilla?.

Hab.—On a beech intermixed with *Z. conoides* at Cromaglown, Killarney, and on the bark of beech along with Z. *conoides* and *viridissimus* at Muckross.

On a limestone wall at Plymouth (18G7, E. M. Holmes). Sweden—Isl. Gotland. (Lindberg).

ON B1MULAMA LIMBORINA. NYL. (Extract of Letter from Dr. Nylander to the Rev. J. M. Crombie.)

In " Licheuological Memorabilia," No. 8, the Rev. Mr. Leighton 6peaksof *Rimularia limborina,* Nyl., and declared that it is identical with *Lecidea trochodes,* Tayl. I do not know what *L. trochodes* may really be, but from the figures of section of apothecium given by Mr. Leighton, it is entirely different from *R. limborina,* such as

I have described it from France, and such as it is in the three or four apothecia I received from yourself from Scotland.* This is at once distinguished by the conceptacle involving the hymenium, and not being open above, as is represented in the figure given by Mr. Leighton (c). Very imprudently the reverend author, in an excess of confidence, has embraced those rude opinions, that "the para-physes becoming dead, subcarbonaceous, and fuscous-black, especially at their apices, form a continuous or partial carbonaceous stratum over the epithecium or disk," which "is purely imaginary " (to use the "gentlemanly "words of the author). Equally " purely imaginary," and more grievous a mistake was it when the reverend author, in " Lich. Memorabilia," No. 4, said " *Zoospores or spermatozoids* do exist in ferns, mosses, *hepaticce"* &c, thus showing scarcely any knowledge of the *zoospores* of which he treats, and concerning the nature of which he might have learned in any elementary treatise. In *Rimularia* th^re is no stratiform epithecium present, but it appears in the form of a fissure of the conceptacle.

Moreover, with respect to the *Lecidece,* of which he treats, it is not sufficient that new species should be definitely and certainly constituted, unless after a fuller and more acute examination of anatomical differences, than what is afforded by giving merely a section of the apothecium and the spores without any micro-metrical measurements for comparison. The characters of the speraiogones ought also at the same time to be given. But of this elsewhere. Meanwhile, *Eimularia* remains as a distinct lichen, and is always to be distinguished from every *Lecidece* whatever with gyrose apothecia; for these in *Eimularia* are never gyrose.

[We cannot approve the tone of this communication.—*J£ditoi*\~\

MYCOGRAPHIA.f

Unfortunately the literature of Mycology consists largely of fragments, memorials of splendid designs never prosecuted, of good intentions never fulfilled. We cannot but call to mind one after another the splendid works we might have consulted had they attained completion. We might instance Venturis Miceto Bresciano, which came to a close at the fourth part; Fries'3 lcones, which fortunately have attained a tenth part; Notaris' Sferiacei Italici, of which one part appeared; Hoffmann's lcones Analytic®, which encountered sudden death at the 4th part ; Gonnerman and Rabenhorst's Mycologia Europaea, which expired with the ninth part; Smith & Saunders's Illustrations, which never got beyond a second part; Nitschke's Pyrenomycetes Germanici, of which only two parts have appeared ; the splendid Flore d'Algerie

* Of my own specimen and of the *true Opegraphi trochodes,* Tayl., in Herb. Tavl. in Herb Brit. Mus., I shall have something to say afterwards.—J. M. C.

t Mycographia, seu lcones Fungorum. Figures of Fungi from all parts of **the** world, by M. C. Cooke. Part i. Williams and Norgate.

stopped in the middle of the Fungi. All these instances seem to indicate some want of adequate support, which may perhaps occasion the addition of the present work to the long catalogue of failures. Let ns hope not !

It is wholly beyond our province, for obvious reasons, to make any comment on " Mycologia," except to introduce it to our readers, with a list of the figures contained in the first part, and a reprint of the-notice which appears therein :—

Figs. 1. Geoglossum hirsutum var. [Americanum.
2. Mulleri, *B.* hirsutum, *P.* Walteri,
3. *B.* Peckianum, 0. glutinOBum, P.
4. difforme, *Fr.* australe, *C.* glabrum,
5. P. viscosum, P. microsporum, *0. $*
6. P. luteutn, *Peck.* olivaceum, P.
7. viride, P. Huokeri, *C.*
8. atropurpureum, P.
9.
10. 17. Peziza (Humaria) Orouani, *C*
18. Wrightii, *B.* <fc *C.* sauguinaria, *G.*
19. Isetirubra, *C.* exasperata, *B.*
20. echinosperma, *Peck.* auriflava, *C.*
21. miltina, *B.* humosa, *Fr.* Mulleri, *B.*
22. euchroa, *K.* leucoloma, *Hedw.*
23. carbonigeua, *B.* corallina, *C.*
24. aggregata, *B. $Br.* fusispora, *B.*
25. modesta, *K.* globifera, *B. & C.*
26. convexella, *K.* convexula, P.
27. quisquiliarum, *B. & C.* flavotingens,
28. *B.* glumarum, *Desm.* limnicola,
29. *Hazs.*
30.
31.
32.
33.
34.
35.
36.
37.
38.
39.
40.

Figs.
41. Peziza (Humaria) xanthomela, P.
42. adusta, *C $* P.
43. pinetorum, *Fckl.*
44. Gerard i, *G.* tetraspora,
45. *Fchl.* semi-immersa,
46. *K.* Oocardii, *Kalch.*
47. salmonicolor, *B. § Br.*
48. astroidea, *Hazs.*
49. Poljtrichi, *Sch,*
50. asperior, *Nyl.*
51. hinnulea, *B. & Br.*
52. vivida, *Nyl.* araneosa,
53. *Bull.* Sowerbei, C.
54. ollaris, *Fr.* rutilans,
55. *Fr.* bella, *B & C.*
56. grauulata, *Bull.*
57. exidiiformis, *B.* <*& Br.*
58 ustorum, *B.* Chateri,
59. *8m.* macrocyatis, *C.*
60. Thumeni, *K.*
61. omphalode^ *Bull.*
62. subbirsuta, *Sch.*
63. melaloma, *A. cf 8.*
64. Franzoniana, *Not.*
65. deformis, *K.*
66. hacmastigma, *Fr.*
67. rubricosa, *Fr.*
68. ecatigena, *B.* canina,
69. *K.* nobilis, *K.* leporum,
70. *Fchl.* murina, *Fckl.*
71. macrospora, *Wall.*
72. brunneoatra, *Desm.*
73. spissa, *B.* echizospora,
74. *Ph.*
75.
76.
77.
78.
79.
80.

The following is the " Notice " above alluded to :—

It would be more than could be expected of one man, within the limits of a natural life, to publish coloured figures of every known species of Fungus, even did he possess the materials for the purpose. Nevertheless one person may contibute to this desirable result, hence I have commenced the present work, intending for the present to confine it to the *Discomycetes.* It was intended to

'presented each smaller genus, and sections or subgenera have of the larger ones, complete in themselves, but the difficulties have been

found insurmountable. Although the genus *Geoglossum* is comparatively complete in the present number, a number of the group *Humaria* still require illustration, and for assistance with these I seek the aid and co-operation of European Mycologists.

The printing has been so arranged that hereafter the sequence of plates, with their descriptions, may be arranged and bound in accordance with individual tastes.

The great increase in the number of species during late years, and the want of uniformity in the determination of species attributed to older authors, render some such work as the present . necessary. It is hoped that " Mycographia " will prove a welcome aid to mycologists.

The sporidia in all instances are drawn by camera lucida to an uniform scale, which is given herewith. To the other figures an indication of the enlargement is given.

. It is proposed that a second part should be issued early in the year 1876, and succeeding parts at intervals of about six months.

In order to complete this section *Humaria* as far as possible, I am desirous of examining and illustrating such of the following as may be regarded allies, viz. :— ~

Peziza endocarpoidea, *Berk,*
„ Archeri, *Berk.*
„ aurantio-rubra, *Fckl.*
„ subgrauuliita, *Berk.*
„ obnupba, *Karst.*
„ intermixta, *Karst.*
„ epitricha, *Berk.*
„ miniata, *Preuss.*
„ Crechqueraultii, *Crouan.*
„ Rfccise, *Crouan.*
„ cremoricol , *Holm*.
or, *Berk.*
muscorum
ascobolimoi pha, *Crouan.*

Peziza hyperborea, *Karst.*
ABCobolus microscopicus, *Crouan**
Peziza squamosa, *Schurn.*
„ eulfurata, *Fries.*
„ subfusca, *Crovan.*
„ fimeta, *Fries*.
„ Sptaagni, *Bonq.*
„ merdaria, *Fries.*
„ fiiniputris, *Weinm.*
Ascobolus Persoonii, *Crouan.*
„ can in us
***Fckl.* Pez·za Ingrica, *Weinm*.**
„ Scbcuckii, *Batsch.*

If specimens of any of these are sent to me for the above purpose, they shall be promptly returned, with thanks.

M. C. COOKE, 2, Grosvenor Villas, Junction Road, Upper Holloway, London, N.

NEW SCOTCH PEZIZA.

Feziza (Sarcoscypha) coprinaria. *Coolie.*

Snbgregarious, sessile, crimson. Cups hemispherical, soon flattened (1 cm. broad) ; margin slightly elevated, fringed with long pale brown septate hairs ; asci cylindrical; sporidia elliptical, smooth; paraphyses clavate at the tips, filled with orange granules.

On dung. Eannoch. Dr. Buchanan White and Mr. Carrington.

A very distinct species. The cups remain flattened in drying, external cells very large, hairs ^ m.m. long. Sporidia -02 x '01. m.m. The hairs are never stellate as in *P. stercorea*, nor is the cup so densely hairy, the hairs being confined to the margin. The name of P. *hippocopra*, under which this species was first reported, has

been replaced since it appears to have occurred on cow-dung. It is curious that at the same time an interesting species allied to P. *stercorea,* on dung, was sent from the United States by Mr. W. R. Gerard, which also is undescribed.*

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SACCARDO, P. A. Fungi Veneti novi vel Critici, ser. iv.

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MOHR, C. Additions to the Bryology of the United States, in " Bull. Torr. Club," Aug., 1874.

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DICKIE. Dr. *(i.* Algaj from the Island of Mangaia, S. Africa, in " Joum. Linn.'Soc," No. 81.

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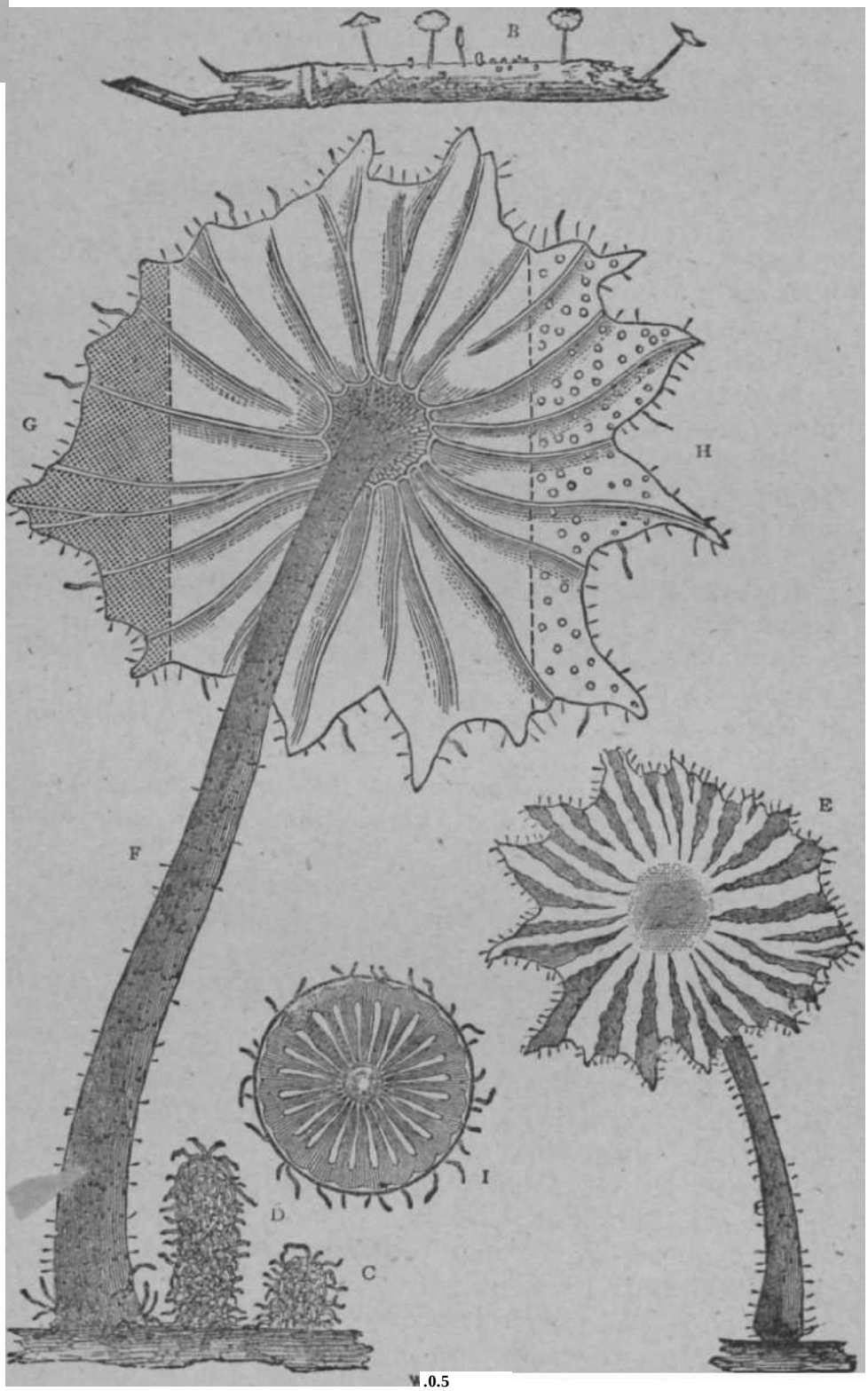
REHM, Dr Ascomyceten, Fasc. vi.

*** *Peziza scuhalonta,* 0. & Ger.—Scattered, sessile, rather flesby. Cups hemi-spherical, soon expanded (1 cm. broad), contracting when dry, externally strigose with rather dense pale brown hairs ; disc concave, orange-red ; asci cylindrical; sporidia elliptic, smooth (018 X '009 m.m.); parapbyaes septate, slightly thickened upwards.**

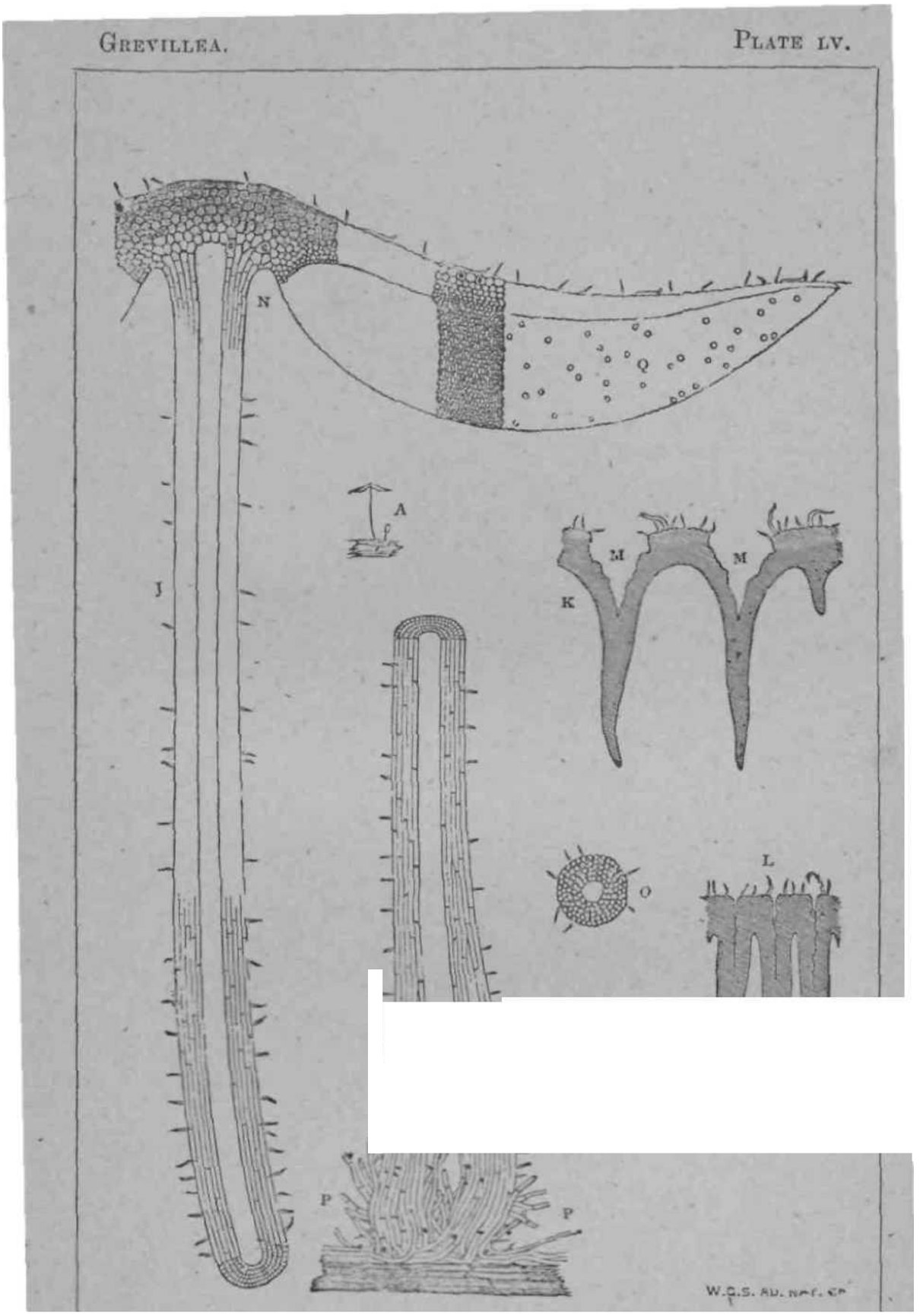
On horse dung. Catsbill Mountains. W. R. Gerard.

Quite distinct from P. *stercorea,* to which it is allied, by the simple hairs and much smaller sporidia, as well as some other features. Hairs about 2 m.m. long.



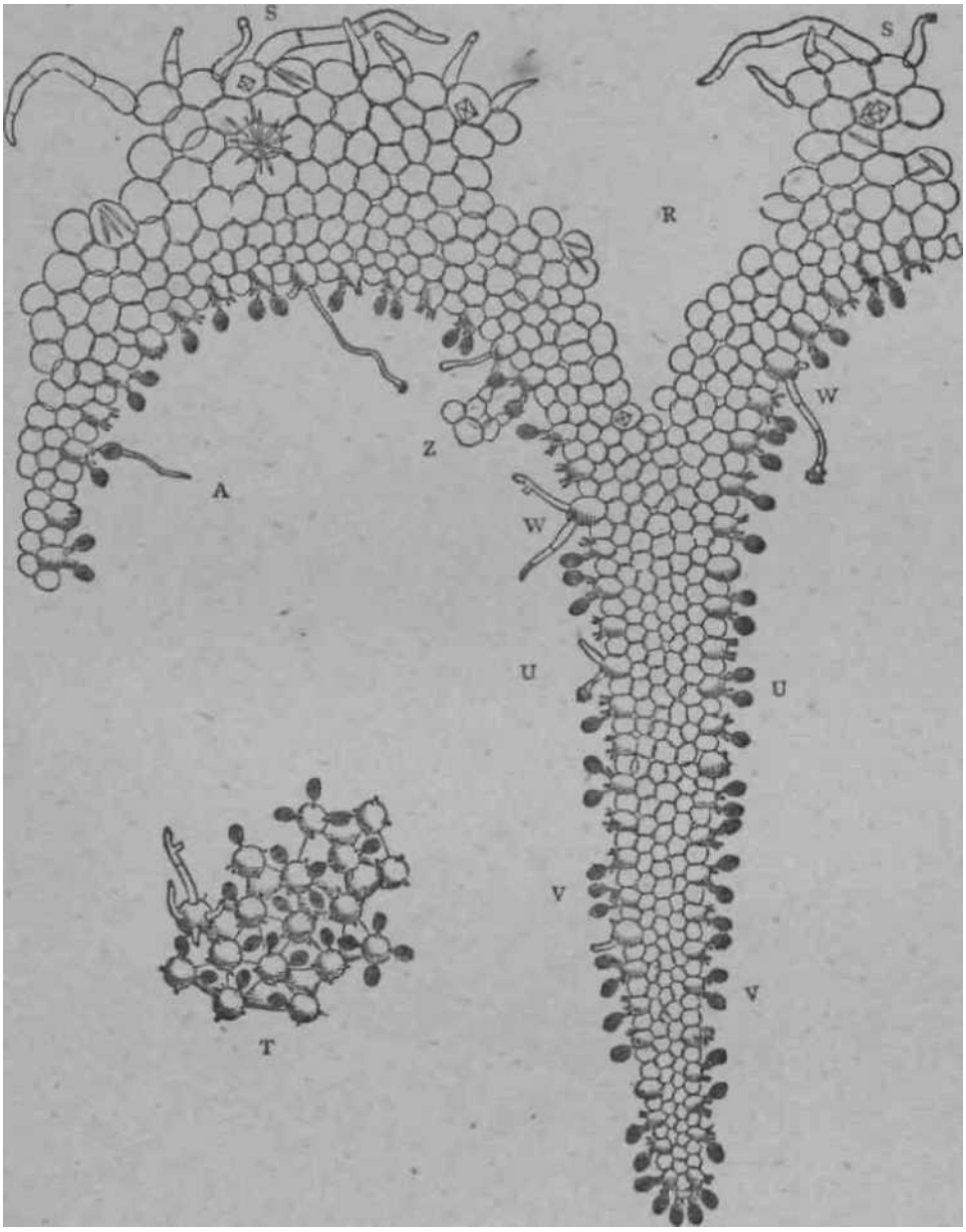
Co?RIKtJ8 IIADIATU8, FR.

A, *Natural size;* E, ***Enlarged*** 10 *dian>.; Other* ***Figures,*** 20 *diam.*



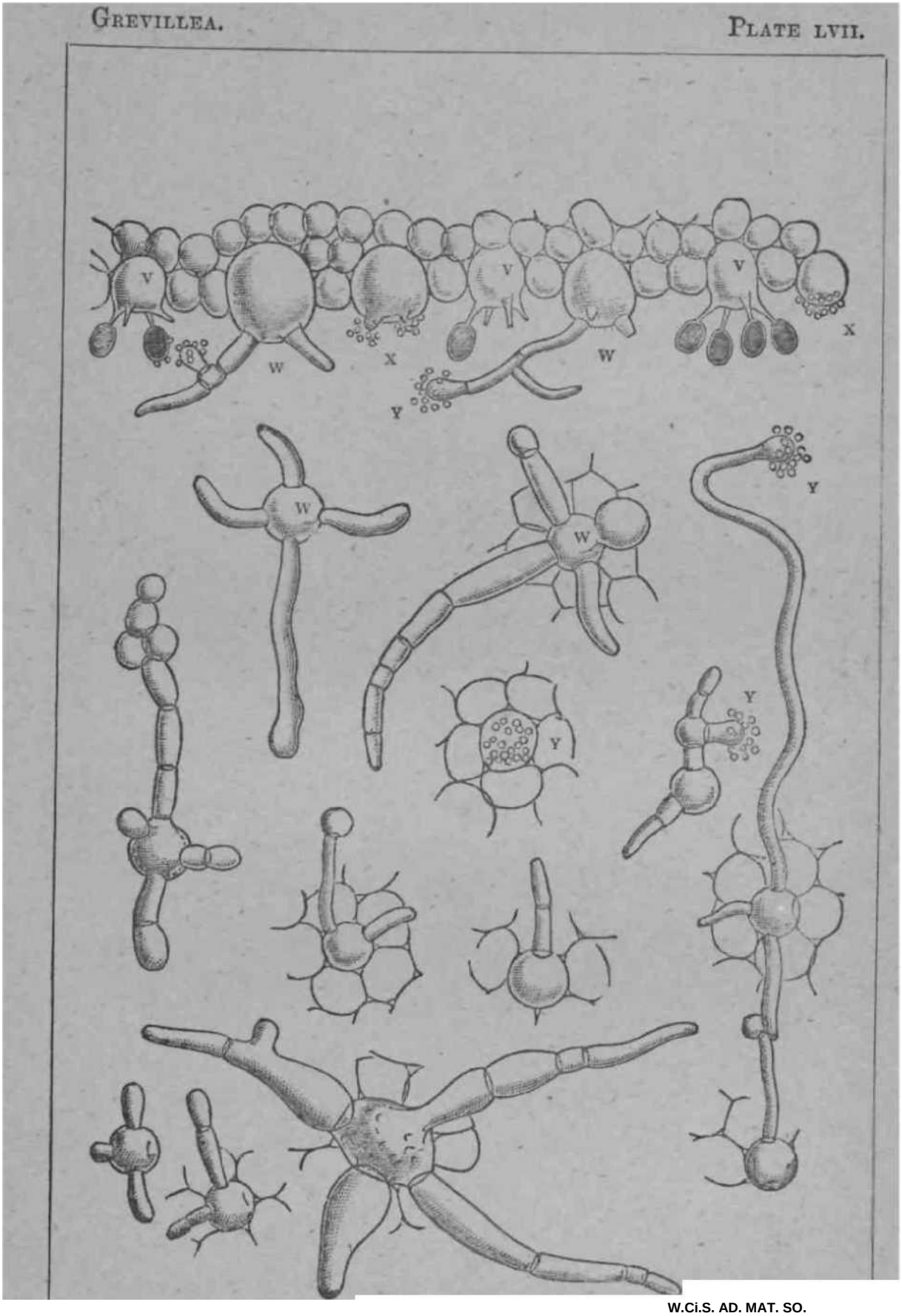
Cormsus BADUTUS, FR.

50 *diam.*

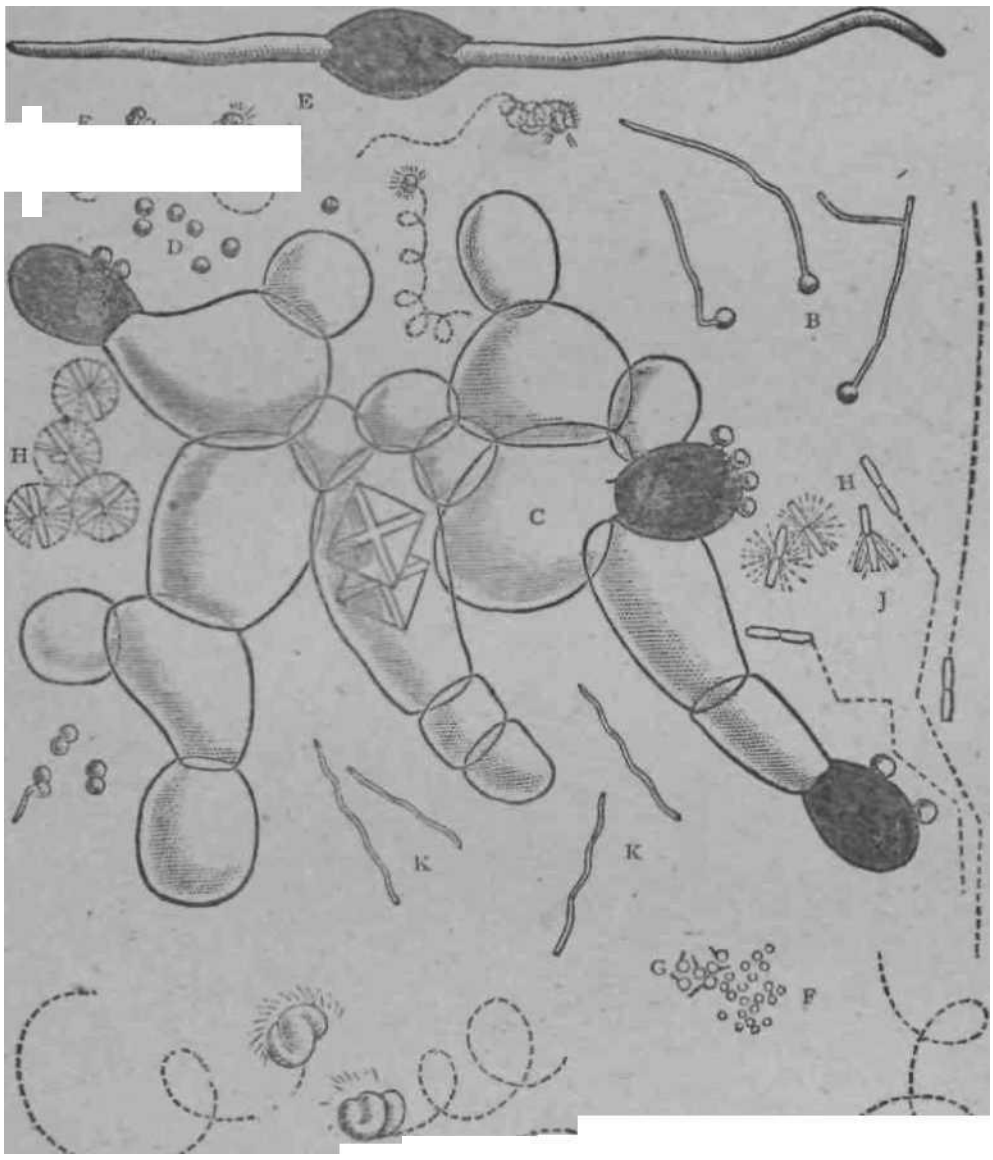


A*. u«I. Ifc.

COPRIKUS* RADIATUS, FH. *Section and Surface of Gill enlarged* 50 *dianu* v, Ba^tJiau-ti/iJipores; w, *Oijstidia*.

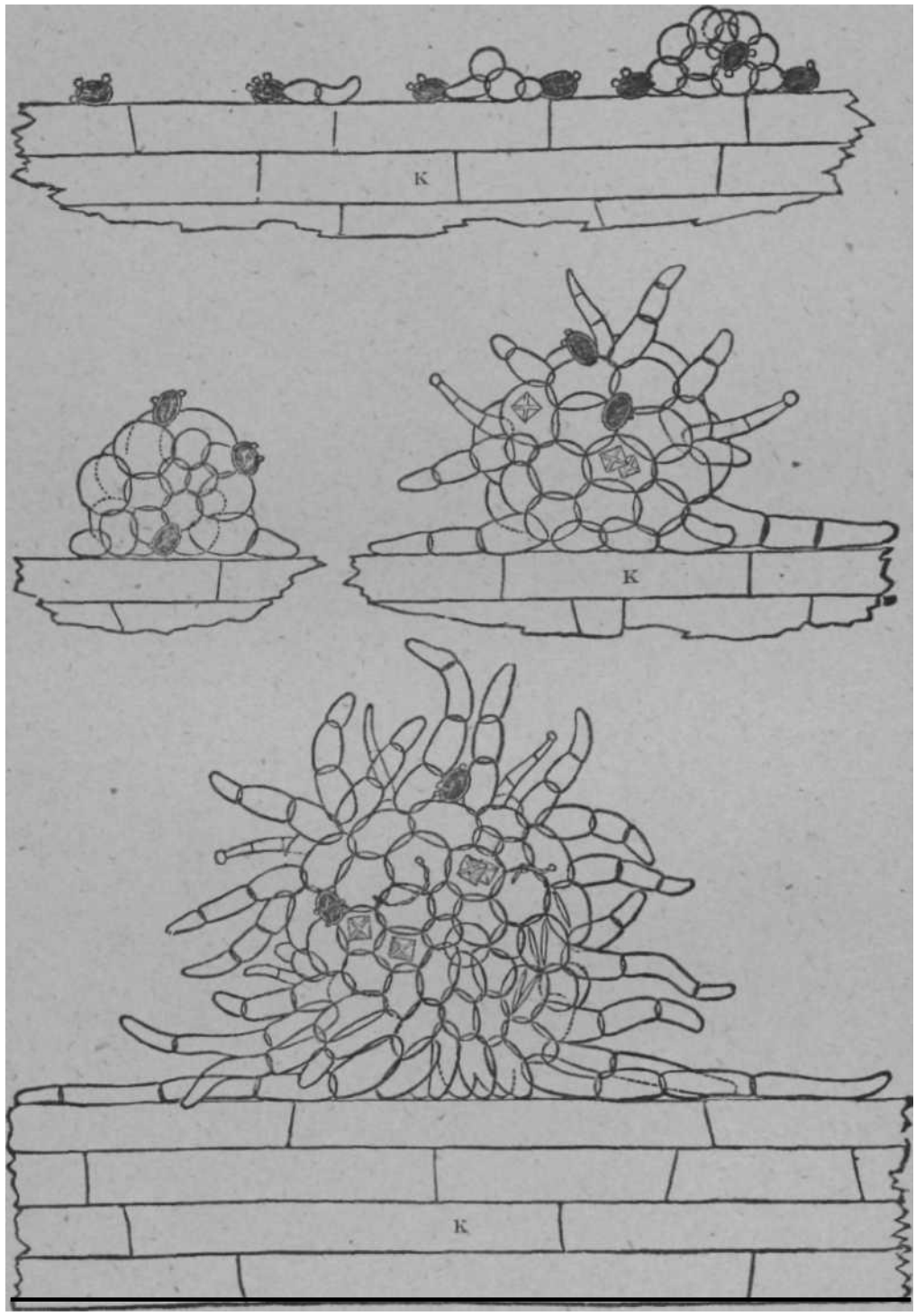


COPRINUS BADIATUS, FR. V, *Basidia bearing Spores;* v_t *Cystididi x,* T, *Spermatozoids.*



*tjh ,-->—.„ *~?

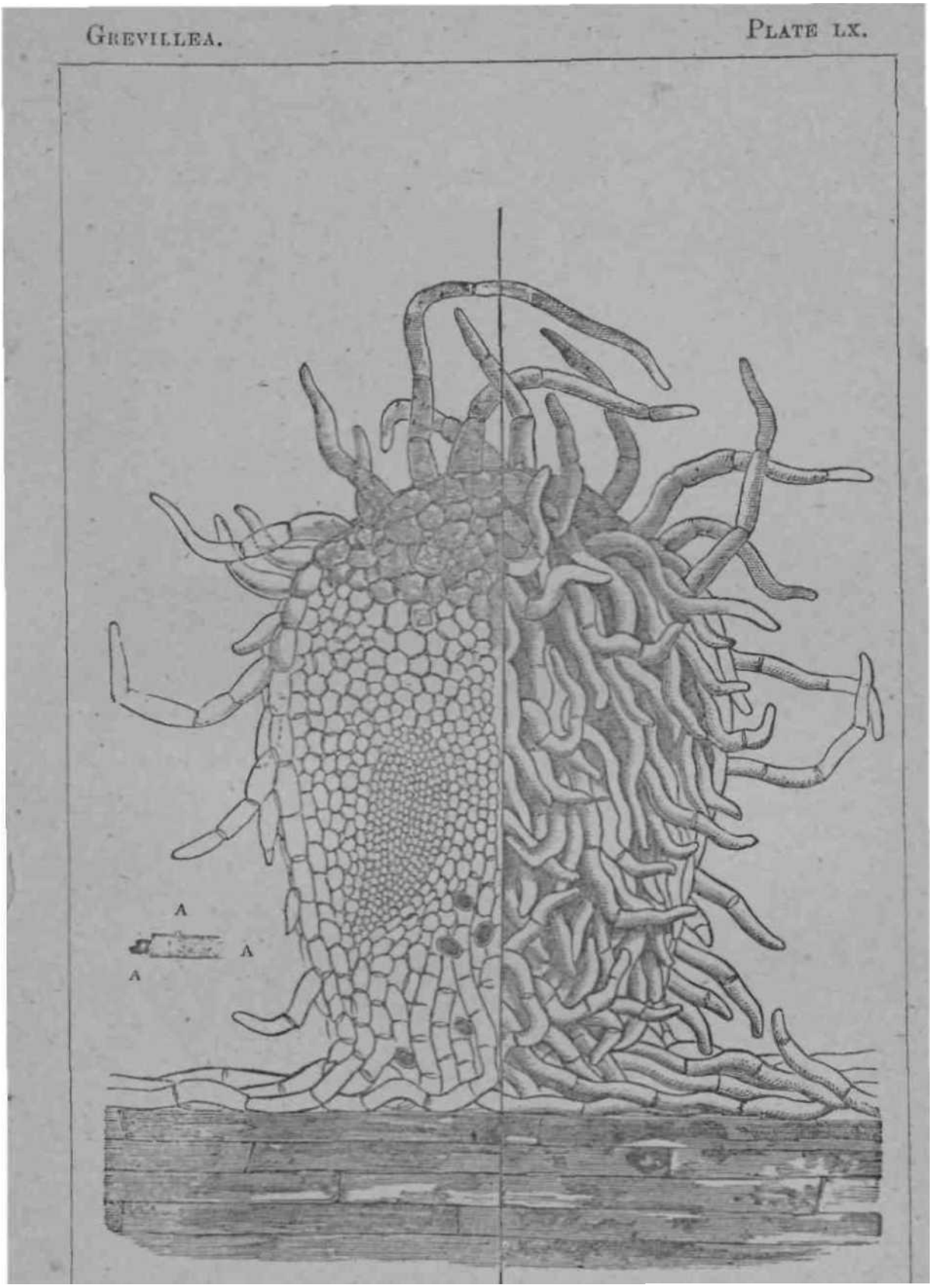
Spores, *infant plant c, and* tTi/itsoriay *enlarged* lOOOdtam.;
a(*hottom further enlarged* 2000 tliam.



W.CS,AO« NAT- SC-

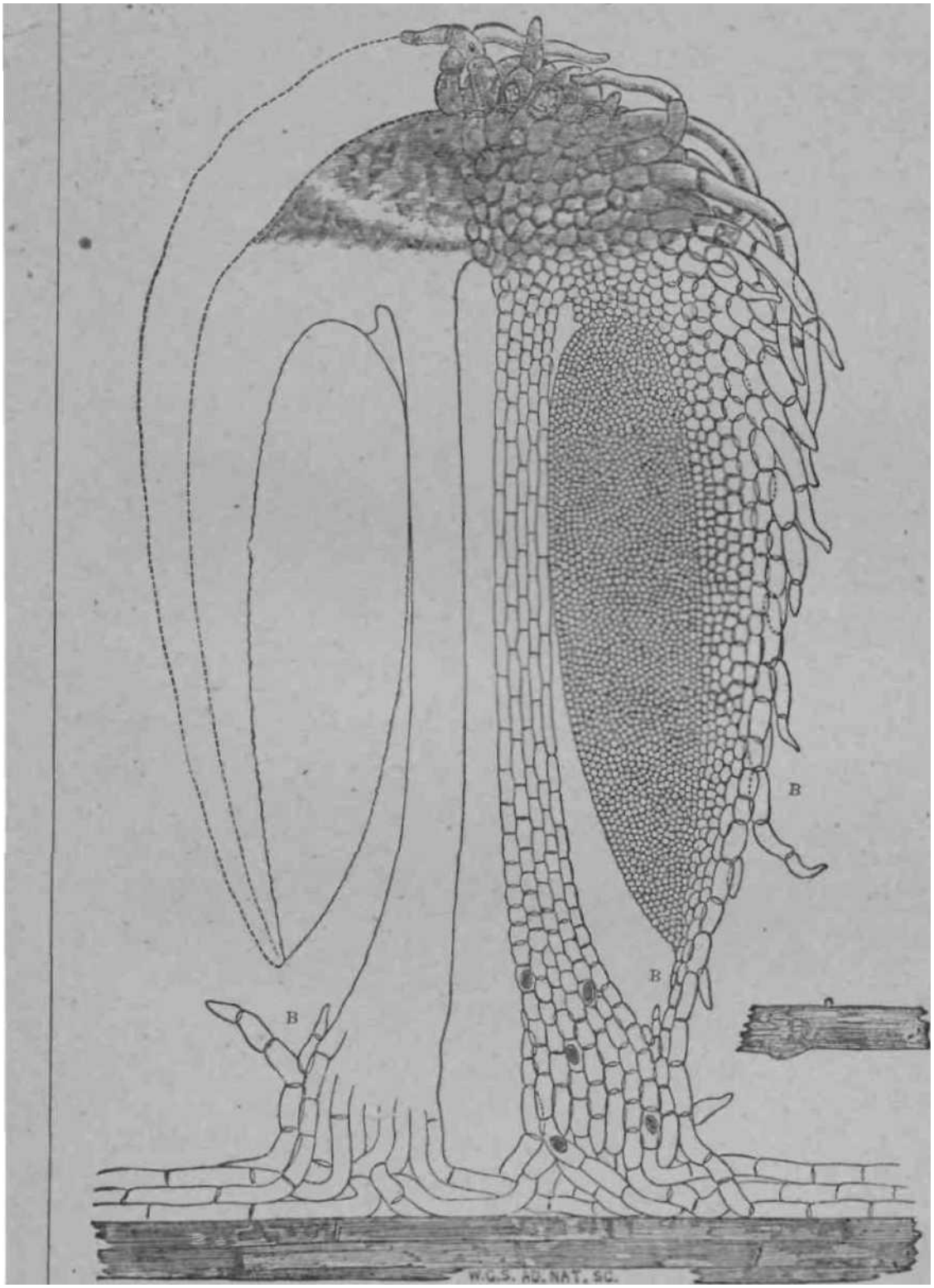
EADIATtJS, FR.

Enlarged 500 (Ziam., as prowtt *from the Spores, in expressed juice of horse^ dung, under a covering glass of microscope.*



Cornixus RAIMATUS, Fit.

■ 'JOQ *diam., and natural me at* \. v, \.



COPRFKUS HADIATUS,
FR. ***Enlarged*** **120** ***diam.***

No. 31.] **[March, 1876.**

Grevillea,

A QUAETEKLY RECORD OF CRYPTOGAMIC BOTANY AND ITS LITERATURE.

NOTICES OF NORTH AMERICAN FUNGI.

By the REV. M. J. BERKELEY, M.A., F.L.S.

***(Continued from Vol. III., Page* 52.)**

845. **Hypoxylon concuxrens.** *B. Sf C.*—Peritheciis minutis confluentibus sursuin tan turn denudatis minutissinie granulatis ; ostiolo minuto, papillaeformi.

Car. Inf. No. 2258.

Perithecia connate, forming a thin black uniform stratum, very minutely granulated, the upper part only exposed ; ostiola minute, papillaeform; sporidia shortly cymbaeform uninucleate.

846. **Hypoxylon Beaumontii.** *B. Sf C.*—Peritheciis globosis connatis ; ostiolo distincto papillseformi; sporidiis oblongo-ellipticis uniseptatis.

Alabama, Beaumont. No. 4617, 4857.

Perithecia rather small at first, slightly brown, then black, smooth, with a distinct papillaeform ostiolum ; asci linear ; sporidia uniseriate, oblongo-elliptic, '0004 long, uniseptate.

* **Hypoxylon serpens.** -P.— Car. Inf. No. 1936. Ravenel.
No. 1749. Alabama, Beaumont. No. 4868.

* **Hypoxylon copropMlum.** *Fr.*—On cow dung. Car. Sup. No.
464.

847. **Hypoxylon equinum.** *B. $f Bar.*—Peritheciis emycelio albo oriundis ostiolis nigris papillaeformibus ; sporidiis breviter cymbaeformibus.

On horse dung. Car. Inf. Ravenel. No. 710. Perithecia springing from a thin effused white mycelium; ostiola papillseform, black; sporidia shortly cymbaeform, -0006 long.

848. **Hypoxylon nudicolle.** *B. fy* C—Peritheciis connatis materie umbrina tectis ; ostiolis prominentibus nigris ; sporidiis oblongis
uniseptatis.

On pine wood. Car. Inf. No. 3275.

Forming a continuous or slightly interrupted umber brown

stratum ; ostiola black, papillaeform; perithecia crowded, covered

with a brownish matter ; asci linear; sporidia uniseriate; sporidia oblong, narrow, uniseptate.

* **Hypoxylon botryosum.** *Fr.*—On *Nyssa.* Carolina. No. 3276.

849. **Hypoxylon rhypodes.** *B. & C.*—Lineari; peritheciis con ges tis minutis albo-pulverulentis ; sporidiis allantoideis. ,

On oak wood. Pennsylvania, Michener. No. 4386.

Growing in lines following the grain of the wood; perithecia minute, connate, covered with white meal; sporidia minute, sausage-shaped.

850. **Hypoxylon exinaceum.** *B. fy Rav.*—Peritheciis ovatis con- natis pulverulentis, collo elongato ; sporidiis clavatis.

On *Liquidambar.* Car. Inf. Ravenel. No. 1367.

Perithecia ovate, pulverulent, with an elongated often curved neck ; sporidia clavate, much attenuated below. A very curious species.

* **Hypoxylon ustulatum.** *Bull.*—White Mountains. New Hampshire, Tuckerman. Rav. No. 1720. Car. Sup. No. 386, 441, 597. Car. Inf. Ravenel.

* **Hypoxylon discretum.** *Schwein.*—On apple branches. Car. Inf. No. 3860. On *Cercis.* Alabama, Peters. No. 4554. On *Magnolia glauca.* Car. Inf. Ravenel. No." 1338.

Sporidia uniseriate, broadly elliptic, -00057 long ; border gelatinous.

851. **Hypoxylon** Bzoomeianum. *B. Sf C.*—Crassum fuscum mar gin a turn ; ostiolis punctatum ; stromate fusco ; peritheciis ostiolo excepto abditis ; sporidiis ellipticis.

On rotten logs. Car. Inf. No. 1894.

Irregular, brown, about 1^ inch across, with a raised obtuse margin, about £inch thick, brownish ; surface quite even, with the exception of the punctiform ostiola; asci linear; sporidia uniseriate, elliptic.

* **Hypoxylon nummulaxium** *B.C.—On Acer rubrum, Quercus falcata, Platamis.* Car. Inf. No. 1437, 1438, 1496, 1554, 1887, 2964. Ravenel. No. 926.

* **Biatrype quadrata.** *ScJiwein.*—On *Ehus copallina.* Car. Inf. No. 3744. Ravenel. No. 1793. On *Prunus.* No. 1917. Ravenel. No.v 635. On *Ulmus Americana.* No. 1559. On *Liquidambar.*

No. 1559. Car. Inf. Ravenel. No. 1559. On *Acer rubrum.*
Pennsylvania, Michener. No. 4351.

Sporidia uniseptate, sometimes contracted at the septum, -00063-•0005 long. Sent out as *Sph. obesa,* B. & C.

* **Diatrype punctulata.** *B.* & i&m-Latissime effusum nigrum
ostiolis punctiformibus depressis.

On dead trunks of oak.

Spreading for many inches, black, punctated, with the minute depressed ostiola.

*** Biatxype stigma.** *Fr.*—On dead branches. Car. Snp. No. 123, 342, 848, 929. Car. Inf. No. 1172, 1507, 162*4, 2321, 2409. Ravenel. No. 1573, 1693, 1780. Pennsylvania, Michener. No. 3580, 3965, 4245.

The fruit varies a little in size. In No. 1780 the sporidia are scarcely curved, but I can see no external difference. In No. 2409 they are just intermediate.

* **Diatrype platystoma.** *8c7w>ein.—On* dead branches. Car. Sup. No. 141. Car. Inf. No. 2096, New York, Sartwell. On *Ilamamelis.* No. 2626. Pennsylvania, Michener. On *Acer rubrwn.* No. 6347.

* **Diatrype atxopunctata.** *SoJtwein.—Oi\~* dead branches. Car. Sup. No. 128. Car. Inf. No. 2507. Ohio.

JSpo$_v$ridia dark, subelliptic, -00114 long.

* **Biatrype clypeus.** *Schwein.*—On dead oak. Car. Inf. No. 24.71.

Sporidia dark, subelliptic.

851 (bis). **Biatrype grandinea.** *B. § R.*—Late decorticans trans-vcrsmi rimosa, ostiolis frequentisshnis aspera; stromate subrufo ; sporidiis fuscis subellipticis.

On oak. Car. Inf. Ravenel. No. 1572.

Spreading for many inches, cracked transversely ; stroma somewhat rufous, rough, with crowded ostiola ; asci clavate ; sporidia dark, subelliptic.

* **Biatxype distffoxmis.** *Fr.*—Car. Sup. No. 42, 715, 810, 817. 847,938. Alabama, Peters. No. 5215. Pennsylvania, Michener, No. 4406.

Var. **Vixescens.** Alabama, Peters. No. 6085. Sporidia sausage-shaped, -0004 long. Cotoosa Springs, Georgia. Ravenel. ■No. 1742. Vermont, J. D. Russell. No. 5885.

* **Biatxype micxoplaca.** *B. & C.* Journ. Linn. Soc. x. p. 386.— Car. Inf. No. 2007. On *Lawus Sassafras.* Ravenel. No. 752. Cuba.

852. **Biatxype hypophlaea.** *P. $ Rav.*—Suborbicularis tenuis ostiolis proininulis exasperata; sporidiis oblongis nee allantoideis.

On dead limbs of *Magnolia glauca.* Car. Inf. Ravenel. No. 1710, 1799.

Forming thin suborbicular patches, which spring from beneath

the cuticle, rough with the scattered ostiola; sporidia oblong, in a single row, not sausage-shaped.

* **Biatxype undulata.** *Fr.*—New England, Sprague. No. 5849.

* **Biatxype vexxueaefoxmis.** *Fr.*—Car. Sup. No. 59, 3433,3439. Car. Inf. No. 1488, 1585, 2198, 3690, 4926, 4943. Ravenel. No. 1431. New England, Murray. No. 6326.

* **Biatxype quexcina.** *TuL*— Car. Sup. No. 520. Alabama, Peters. No. 4005.

*** Diatrype Duriaei.** *Mont.—C&r.* Inf. No. 2491. New Jersey.
No. 4703. Connecticut, C. Wright. No. 5643.

Sporidia eight in each ascus, '0006 long, sausage-shaped.

*** Diatrype Smilacicola.** *Schwein.*—On *Smilax rotundifolia.*
Pennsylvania, Michener. No. 3540. Car. Inf. No. 3837.

Sporidia sausage-shaped.

* **Diatrype Cephalanthi.** *Schwein.*—Alabama, Beaumont. No.
4663.

Sporidia numerous, sausage-shaped.

853. **Diatrype asterostoma.** *B.* <fc *C.*—Pustulis elevatis ; ostiolis
stollatis; stromate albo ; sporidiis allantoideis majoribus octonis.

On fallen branches. Car. Inf. No. 2203.

Pustules raised ; ostiola stellate ; stroma white; sporidia rather large, sausage-shaped, eight in each ascus.

854. **Diatrype plagia.** *B. $ C.*—Pustulis transversim erumpentibus ; ostiolis substellatis ; stromate parvo fusco ; sporidiis octonis
allantoideis.

On *Liriodendron.* Car. Inf. No. 212.

Bursting through the bark transversely ; ostiola substellate ; stroma brown, scanty; asci clavate; sporidia eight in each ascus, sausage-shaped.

* **Diatrype aspera.** *Fr.*—On *Alnus serrulata.*
Pennsylvania,
Michener. No. 3505.

* **Diatrype viticola.** *Schwein.*—Car. Inf. No. 4975. Sporidia
oblong, elliptic, uniseptate, constricted slightly at the septum,
•0006 long.

854. **Diatrype carpinigera.** *B. 8f C*— Pustulis parvis nigris;
peritheciis abditis; sporidiis oblongis uniseptatis.
On hornbeam. Pennsylvania, Michener. No. 4388. Pustules small, black; perithecia hidden ; sporidia oblong, uniseptate, -0006--00057 long.

855. **Diatrype sphendamnina.'** *B.Sf C.*—Pustulis longitudinaliter erumpentibus ; ostiolis brevibus cylindricis; ascis clavatis ; sporidiis uniseriatis oblongis angustis hyalinis.

On *Acer mbi^um.* Pennsylvania, Michener. No. 4221.

Pustules splitting the bark longitudinally, and overtopped by its fragments; ostiola short, cylindrical; asci clavate'; sporidia uni-seriate, oblong, narrow, hyaline.

* **Diatrype corniculata.** *Fr.*—On (lead limbs 'of

Fraxinus.
Santee Canal, Ravenel. No. 1836. On oak. No. 1715.

* **Diatrype Vitia.** *Schwein**—Car. Inf. No. 32, 30.

* **Diatrype hystrix.** *Tode.*—On *Benzoin odorifera.* Pennsylvania, Michener. No. 4329.

* **Diatrype ferruginea.** *Fr.*—On oak. Car. Inf. No. 1078.
Pennsylvania, Michener. No. 3969. On *Populus tremelloides.*

856. Diatrype subfulva. ***B. $ C.*****—Pustulis parvis apice fulvo-pulverulentis; ostiolis nigris pertusis demum emergentibus ;**
sporidiis allantoideis plurimis.

On *JSTyssa.* Car. Inf. No. 4929.

Pustules small, covered above with tawny meal; ostiola at length emergent, black, pierced ; asci clavate, with long pedicels; sporidia numerous in each ascus, sausage-shaped, '0004 long.

*** Diatrype strumella.** ***Fr.*****—On gooseberry. Mountains of New**
York. No. 4499.

Sporidia fusiform, triseptate, *0005 long.

857. Diatrype Titan. ***B. fy Rav.*****—Pustulis irregularibus ex ostiolis emergentibus rugosis subtiliter granulatis; sporidiis maximis**
6-septatis.

On bark of hornbeam. Car. Inf. Kavenel. No. 1552.

Pustules irregular, black, rough with the protruding ostiola minutely granulated; sporidia fusiform, obtuse at either end, dark with about 6-septa, -004 long.

*** Eutypalata.** ***Tul*****—Car. Sup. No. 626, 819, 828. Car. Inf.**
No. 1896, 1916, 1904, 4946. Ravenel No. 1543, 1357. Vir
ginian Mountains. No. 3328, 3365. Pennsylvania, Michener.
No. 4128.

*** Eutypa leioplaca.** ***Fr.*****—Car. Inf. No. 1475.**

*** Eutypa milliaria.** ***Fr.*****—Pennsylvania, Michener. No. 4166.**
Sporidia -0003 long, sausage-shaped.

*** Eutypa limaefoxmis.** ***Schwein.*****— On oak. • Car. Sup. No. 921.**
On *Liquidambar.* No. 836. Cotoosa Springs, Georgia. Ravenel. No. 1737. Ohio.

858. Eutypa subpyramidata. ***B. 8f C.*****—Effusa ; peritheciis ni-**
gerrimis subpyran>idatis ; sporidiis biconicis elongatis.

On oak. Car. Sup. No. 741.

Effused, perithecia of a somewhat pyramidal shape, forming a rasp-like stratum ; asci lanceolate, much attenuated below, sporidia, biconical, each division much attenuated.

*** Eutypa scabriseta.** ***Schwein,.*****—Car. Inf. Ravenel. No. 770.**
Spoiidia sau&uge-shaped, #0002 long.

*** Melogramma gastrinum.** ***Tul.*****—On oak. Car. Inf. Ravenel.**

No. 13G5. Cotoosa Springs, Georgia. No. 1736.

*** Melogramma gyrosum. *TuL*—Car. Sup. No. 55, 238, 462.**

713. Car. Inf. On *Liquidambar,* Ravenel.

*** IKKelogramxna quercuum. *Schwein.*—Car. Sup. No. 99, 188,**
Car. Inf. No. ie8, 1169, 1280, 1353, 3865.
Ravenel. No.
1583, 1787. New York, Sartwell. No. 1858, 3070. .

There are also many numbers on various plants with similar sporidia, which have been distributed as *Sphceria mutila.*

* **Melogxamma ttleliae.** *Schwein.—C&v.* Inf. No. 2679, 1615.
Ravenel. No. 597, 1811.

* **Melogxamma Calycanthi.** *Schwein*—Car. Inf. No. 3704.

* **Melogxamma xhizogenum.** *B.* Hook Lond. Journ, 1845, p.
312.

On *Gleditschia.* [x] Car. Sup. No. 1788.

Sporidia elliptic.

* **Melogxamma ambiguuxn.** *Schwein.*—On *Rhus copallina.* Car.
Inf. No. 1182, 2770. Kavenel. No. 939,1788, 1791. On *Rhus*
radicans. No. 157.

Sporidia hyaline, cymbjcform, *0015 long.

859. **Melogxamma hoxizontale.** *B. $ C*—Transversim erumpens ; peritheciis subtiliter pulvcmlentis; ascis clavatis amplis ; sporidiis fusiformibus hyalinis.
On *Gossypium.* Car. Inf. No. 1892. Ravenel. No. 588.
Bursting the bark transversely ; perithecia minutely pulverulent; asci large, clavate; sporidia hyaline fusiform.

* **Melogxamma Gleditschiae.** *Schwein.*--Pennsylvania, Michener. No. 3943.

Very distinct from the *Af. rhizogenum.*

* **Melogramma Hibisci.** *Schwein.*—Car. Inf. No. 1486. On
Hibiscus Syriucus.

* **Melogxamma Van Vleckii.** *Schwein.^On Bignonia radicans.* Pennsylvania, Michener. No. 6009.

Sporidia narrow, fusiform, hyaline, -0006 long.

Schweinitz' original"specimen is probably the stylosporous state.

860. **Melogxammagxaphideum.** *B. $ Itav.*—Breve graphideum cortice marginatum ; sporidiis breviter fusiformibus hyalinis.

On *Myrwa cerifera.*

Looks at first sight like a Lichen, as the strata are of various shapes, triangular, sinuated, &c, and surrounded by the rigid border of the bark ; sporidia shortly fusiform, hyaline, -0008 long.

ihere are other allied forms in the collection. On *Cratcegus cordata,* Pennsylvania, No. 3509, with cymbaform sporidia, -0008 long; on *Cercis Canadensis,* No. 795, Car. Sup., with similar sporidia; on *Cyrilla,* Car. Inf., No. 2189, and several which seem

g

861. **Melogramma dichanoidea**. *B. $>* C—Maculis ostiolis
comcis rngosis exasperatis ; sporidiis oblongis obtusis uniseptatis.

On oak. Alabama, Beaumont. No. 4£62.

Looks at first sight like a *Dwhana;* spots bursting out transversely, but generally orbicular, very rough with the conical rugose pulverulent ostiola; asci clavate ; ^poridia hyaline in one or sometimes two rows, oblong, sometimes narrower below, obtuse, -001 long.

862. **Melogramma subaguilum.** *B. $ C*—Peritheciis

externally distinct, but without fruit, especially Car. Inf., No. Ild9 on *Magnolia glauca.*

longitudinaliter erumpentibus ; ascis clavatis ; sporidiis hyalinis uniseptatis angustis.

On *Ace?' stnatum.* Massachusetts. No. 3405.

Perithecia few, bursting through the bark longitudinally ; asci clavate; sporidia narrow, uniseptate, constricted more or less at the septum, sometimes almost biconical, -00083 long.

* Melogramma insidens. *Sch?vein.*—On ash. No. 4394. /Penn sylvania, Michener. No. 4353.

Sporidia oblong, in one or two rows uniseptate, '0003 long.

Car. Inf., No. 1542, 29G0, *Splicena collematoidcs,* B. & C, scarcely differs, except in the stratum being more pulvinate. *Spliceria Gallce,* Schwein, is a *Sphceropsis.*

863. Melogxamma Spxaguei. *B. $ C.*—Massa undulata pulve-rulenta; ascis linearibus; sporidiis clavatis triseptatis verticuliter devibis.

On *Pinus strobus.* Massachusetts, C. J. Sprague.

Undulated, pulverulent, looking like the woik of some burrow-ing larva; perithecia entirely concealed; asci linear; sporidia shortly clavate, with three horizontal and a few vertical septa.

* **Valsa piunastxi.** *Fr.*—On *Cerasus.* Car. Inf. Kavenel. No.
1271.

* **Valsa stellulata.** *Fr.*—Car. Inf. No. 2277. Ravenel. No.
547, 583, 584, G15,1341, 1343, 1430, 1453,1792. Pennsylvania, Michener. No. 3427, 4119, 4176, 4224, 4391, 4412. Texas, C.
Wright. No. 3900. New Jersey. No. 4678, 4693. Ohio. No.
5884. To these might be added fifty more numbers, many of which have been sent out as *Sph. tetraploa*.

* **Valsa Toxici.** *Schwein.*—On *Rims radicans.* Car. Inf. Rave
nel. No. 1424.

* **Valsa** anomia. *Schwein.*—On *Robinia.* Virginian Mountains.
No. 3345.

In the Schweinitzian specimen the sporidia are sausage-shaped, •0004-*0003 long. In the Virginian we have the stylosporcs fusi-forni or slightly curred and obtuse, uniseptate, .0013 long, with **a** long slender pedicel.

* **Valsa haustellata.** *Fr.*—On *Alnusserndata.* Car. Inf. Ravenel. No. 1663, 1764. On *Ostrya virginica.* No. 1805. Santee Swamp.
No. 1815.

* **Valsa** Leaiana. *B.*—Hook. Lond. Journ., 1845, p.
311.

On hornbeam. Car. Inf. Ravenel. No. 1364.

Sporidia sausage-shaped. *In ISphceria carpvni* linear oblong, 3-septate.

* **Valsa fibrosa.** *r.—Mountains of New York. No. 4467.

Sporidia oblong, elliptic, uniseptate, at length fenestrate, *0006 long.

*** Valsa Notaxisii.** *Mont. & Dw.—On Eobinia.* Car. Sup. No.
122. On *Gleditschia.* No. 83. Car. Inf. No. 2594. On oak.

Sporidia uniseptate, constricted at the septum, obtuse at either end, or apiculate.

* **Valsa nivea.** *Fr.—On Poplar.* Pennsylvania, Michener. No. 4248, 5890.

* **Valsa leucostoma.** *Fr.*—Car. Sup. No. 25, 36, 193. Car.
Inf. Ravenel. No. 1590, 1591. Pennsylvania, Michener. No.
4343, 6004. New York. No. 1796.

* **Valsa angulata.** JFV.—Car. Sup. No. 237. On *Ilex opaca.*

* **Valsa dissepta.** *Fr.—On Salix.* Car. Inf. No. 3798. On
Amorpha fruticosa. Car. Inf. Ravenel. No. 1219.

8G4. **Valsa munda.** *B. $ C*—Subcuticularis disco parvo albo-cincto; ascis lanccolatis, sporidiis allantodeis.

On smooth yellow branches of *Cornus.* Alabama, Peters. No. 5196.-

Pustules completely covered by the bark, which is blackened over them, or appears black by transparence, the disc alone, which is bordered with white, being free; asci lanceolate ; sporidia sausage-shaped.

865. **Valsa Pennsyjvanica.** *B.* #• C Transversim erumpens ; pcritheciis incusis; sporidiis oblongis triseptatis.

On *Cerasns pennsylvanka.* Mountains of New York. No. 4434.

Bursting transversely; perithecia in the centre of a facette; sporidia narrow, oblong, sometimes wide at one end, sometimes slightly curved, triscptate, *001 long.

8G6. **Valsa glyptica.** *B. Sf* flwrcy.—Epidermide tecta nigrocincta; sporidiis fusiformibus uniseptatis. On willow. Car. Inf. No. 3011.

Quite covered by the bark, which is merely pierced by the ostiola, , surrounded more or less evidently by a black line; sporidia fusi-form, sometimes sigmoid, uniseptate, *0018-'0022 long.

* **Valsa colliculus.** *Woi«mlt.*—On pine. New York, Sartwell.
No. 3449.

8G7. **Valsa oxbicula.** *B. Sf.* C—Minuta orbicularis nigro-cincta; ostiola albo-cincto, ascis lanceolatis, sporidiis allantodeis.

On willow. Car. Inf. No. 3404.

Minute, orbicular, showing the subjacent perithecia by trans-parence, but not blackened, surrounded by a black line ; asci lan-ceolato; sporidia sausage-shaped, '0004 long. +

* **Valsa subscxipta.** *Fr.*—On *Bobinia.* Car. Inf. No.

3291.
Sporidia sausage-shaped; asci minute.

* **Valsa coxonata.** JV.—On *Castanea.* Virginian Mountains.
No. 3351.

*** Valsa leiphaemia.** *Fr.*—On fallen logs of oak. Car. Inf.
Ravenel. No. 1580. Pennsylvania, Mjchener. No. 4137.

868. **Valsa leiphaemioides.** *B. 8f C*—Pustulis subcorticalibus, ostiolis congestis tandem expositis; pulvere niveo intermixtis, sporidiis allantoideis.

On oak. Car. Inf. No. 2505. New England, Sprague. No. 5415.

Pustules, when the cuticle is stripped off, covered by the brown bark, the ostiola only exposed and mixed with white matter; spo-ridia sausage-shaped, '0004 hong. Closely resembling the last, but with different fruit.

8G9. **Valsa castanicola.** *B. $- C.*—Parva sudepressa, ascis sub-clavatis ; sporidiis biseriatis cymbaeformibus, triseptatis, septis verticaliter divisis.

On small twigs of *Castanea.* Virginian Mountains.

Pustules small, rather flat; ostiola not prominent; asci slightly clavate; sporidia biseriate ; sporidia cymbajform, pointed, trisep-tate, at length vertically divided, -0004 long.

* **Valsa pini.** *Fr.*—New England, Sprague. No. 5296, 5427.

Sporidia sausage-shaped, -0046 long.

* **Valsa viUs.** *Schwcin.*—Car. Inf. No. 2135. Car. Sup. No.
628, 3706. Pennsylvania, Michener. No. 4238.

Sporidia sausage-shaped, '0006 long.

* **Valsa stilbostoma.** i^-.-Car. Inf. On *Acer.* On *Melia.*
Ravenel. No. 557.

* **Valsa salicina.** *h—Car. Sup. No. 4. New England,
Russell. No. 5039, 5955, 3494.

I cannot distinguish No. 4209. Pennsylvania, Michener, on ***Viburnum dentatum.*** **Car. Inf. on *Liquidambar.* No. 2072. All** these agree as to the sporidia with *Scl. Myc.* No. 10, 0006-0007. On *Platanus.* New England, Sprague. No. 6321. The sporidia are-001.. In *Syringa,* Pennsylvania, Michener, No. 4086, they are -0006.

Valsa ambiens. P.—On apple. Pennsylvania, Michener. No. 3980,4089,4095,4118. New York, Sartwell. On *Prunus.* No. 2627, 2628.

* **Valsa suffusa.** *Fr.*—New Jersey. No. 4685.

870. **Valsa fulvella.** *B. & Rav.*—Pustulis cortice arete inclusis,
disco fulvello ostiolis nigris punctato; sporidiis allantoideis.
On *Platanus occidentalis.* Car. Inf. Ravenel. No. 1825.
Pustules closely covered .by the bark, which is raised up, disc

pale-tawny, dotted with the black ostiola ; sporidia sausage-shaped.

871. **Valsa corynostoma.** *B. $ Rav.*—Pustulis cortice abditis ;
o&tiolis clavatis, sporidiis allantoideis.

On *Acer rubrum.* Car. Inf. Ravenel. No. 1587.

Pustules small,/scarcely raising the bark; ostiola fasciculate, club-shaped; sporidia minute, sausage-shaped.

872. **Valsa** caryigena. *B. $ C*— Pustulis seriatis ; ostiolis ma-teric alba intermixtis ; sporidiis allantoideis.

On branches of *Carya.* Pennsylvania, Michener. , No. 5150. ^ Pustules small, in rows, covered below with the smooth bark, disc white, studded with the black ostiola ; sporidia sausage-shaped, •0004 long.

873. **Valsa Americana.** *B. fr* C—Pustulis epidermide tectis, ostiolis congestis necs tellatis ; ascis clavatis ; sporidiis allantoideis.

On branches of various trees from various parts of the United States; almost as common as *Valsa stellulata*. It has the appearance of *V. stilbostoma,* but the sporidia are quite different.

874. **Valsa innata.** *B. fr* £—Pustulis subcorticalibus planis ; ostiolis disco elevato brevi abditis ; aseis filiforinibus ; sporidiis oblongis.

On *Castanea vesca.* Mountains of New York.

Perithecia forming a flat annular ring round the raised disc, within which the ostiola are concealed ; asci filiform ; sporidia in a single row, oblong, slightly narrowed either way from the centre, •0003 long.

875. **Valsa albo-velata.** *B. % Q.*—Pustulis cortice tectis ; disco albo ; ostiolis nigris cylindricis punctato ; ascis clavatis ; sporidiis angustis fusiforniibus quadrinucleatis.

On *Elms copaUinn.* Car. Inf. No. 1885, 2479.

Pustules hid by the bark; disc white, pierced by the cylindrical ostiola; asci clavate; sporidia biseriate, fusiform, or narrowly cymbiform, with four nuclei. The specimens are accompanied by an *Helminthosporium,* with short fusiform, triseptate spores.

* **Valso pulchella.** *V.—Car. Sup. No. 310. Car. Inf. No. 1545, 1890. On peach.

876. **Valsa** gemmata. *B. S{ C.*—Peritheciis paucis, collis una erumpentibus apice stcllatis ; sporidiis fusiformibus brevibus 3-septatis.

On *Rhus radicans.* Car. Inf. No. 3046.

Porithccia few, circulating; necks united ; ostiola stellate; sporidia shortly fusiforms, triseptate.

877. **Valsa tribulosa.** *B. Sf C.*—Peritheciis paucis, collis spicu-losis; sporidiis fusiformibus 3-septatis.

On alder. Car. Inf. No. 5003.

Perithecia few ; necks subcylindrical, projecting ; sporidia fusi-form, triseptate, '0008 long.

878. **Valsa condensata.** *B. Sf C.*—Pustulis parvis ; ostiolis brevi-
bus*; stromate fusco; sporidiis obovatis, 5-septatis, hie illic verti-
caliter devisis.

On *Quercii8 montana*. Virginian Mountains. No. 3364.

Pustules small; ostiola short; sporidia obovate, divided horizontally and vertically, "0008 long.

879. **Valsa mesoleuca.** *B. & C.*—Disco albo, ostiolis cincto vel consperso; sporidiis allantodeis hyalinis.

On *Viburnum dentatum.* Pennsylvania, Michener. No. 4207. Disc white, surrounded by the black ostiola, or sometimes dotted ; sporidia hyaline, sausage-shaped, -0008 long.

* **Valsa quaternata.** *Fr.*—On poplar and *Alnus serrulata.* Pennsylvania, Michener. No. 4102. 4229. Vermont, Rev. J. D. Russell. No. 5888.

Sporidia -0005 long.

* **Valsa aculeans.** *Schwein.*—On *Rhus typhina.* Massachusetts. No. 3376.

Sporidia fusiform, narrow, triseptatc,-0006 long.

* **Melanconis chxysostiroma.** *Tnl.*—On *Quercus alba.* No. 2961.

* **Gibbera pulicaxis.** *Fr.—On Zea.* Car. Sup. No. 301. On wheat. No. 897. Car. Inf. No. 3843, 2126, 2218. Ravenel. No. 1831. On *Hibiscus syriacus.* No. 2726". On *Brassica,* Car. Inf. No. 6017. On *Gourd,* Pennsylvania, Michener. No. 3821. On *Juglans nigra.* No. 3421.

* **Gibbera Saubinetii.** *Mont. Sf Bur.*—On *Zea.* Car. Inf. No. 1412, 1431. New England, Murray. No. 6282. Pennsylvania, Michener. On *Scirpus jwngens.* No. 4381. On willow. No. 4372.

* **Dothidea gxaminis.** *Fr.*—Car. Sup. No. 370, 663, 746. Car. Inf. No. 3205, 3221. Ravenel. No. 1804. On *Scirnus.* New York, Sartwell. No. 3466.

Sporidia -0004 long.

* **Dothidia gangxaena.** *Fi*—On leaves of *Isolejiis capillaris.* Car. Inf. No. 1653. Ravenel. No. 1657.

Sporidia narrow, as in *D. stenospora,* B. & Br., Journ. Linn. Soc. xiv., p. 134.

Alabama, Beaumont. No. 4658. Sporidia -001 long.

* **Dothidea canaliculata.** *Schivein.*—On leaves of *Cyperus Baldwinii.* No. 1755.

* **Dothidea Trifolii-** *Fr.*—On loaves of clover. Pennsylvania, Michener. No. 3489. Canada, Poe. No. 6165.

880. **Dothidea perispoiioides.** *B. &r C*— Superficial reticulata nigra ; ascis clavatis; sporidiis uniseptatis medio constrictis.

On loaves of *Rhyncosia monophylla.* Car. Inf. No. 1263. On *Indigojera Caroliniensis.* No. 1289. Ravenel.

Forming a net work on the upper surface of the leaves; a^ci clavate ; sporidia biseriate, oblong, uniseptate, constricted at the septum, obtuse or slightly pointed at either end, 0012 long.

* **Dothidea Lespedezae.** *ScJwein.*—Car. Inf. Raven el. No.
1977.

* **Dothidia** anemones. *Fr.*—On leaves of *Anemone Virginica,*
Car. Sup. No. 744, 774.

* **Dothidea xibesia.** *Fr.*—Maine, Rev. J. Blake. No. 6302,
5296. New England, Sprague. No. 5309. Russell. No. 5950.
Pennsylvania, Micbener. No. 4071. Without fruit, I cannot
distinguish. On honeysuckle. No. 4326. On *Madura aurantiaca.*
No. 6001. *Dothidea capreolata,* Schwn. Car. Inf. No. 2685.
On *Bignonia capneolata,*

881. **Dothidea Haydeni.** *B. $ C*—Irregularis papillata ; sporidiis linearibus utrinque attenuatis.

On stems of *Aster* and *Erigeron.* Nebraska, Hayden. No. 6404.

Forming elongated, irregular, papillose patches ; sporidia linear, attenuated at either end.

882. **Dothidea Coluteae.** *B. # C*—Pulvinata Isevis, cellulis;
stromate inclusis : ascis clavatis; sporidiis oblongis uniseptatis
centro constricti.
On twigs of *Colutea.* Pennsylvania, Michener. No. 4072. 4250.
Pulvinate, even, containing several cells ; asci clavate; sporidia oblong, uniseptate, constricted at the septum, "0005-"0008 long.

* **Dothidea culmicbla.** *Bchwein.*—On stalks of grass. Car. Inf.
No. 4938. Canada, Poe. No. 5000.

* **Dothidea Berberidis.** *B. Not.*—Murray. No. 6242.

* **Dothidea Sambuci.** *Fr.*—On *Morus multicaulis.* Car. Inf.
No. 2044. *Dothidea Mis sour iensis,* Schwein, Car. Inf., No. 2233,
is not a fungus.

883. **Dothidea seminata.** *B. $ Rav.*—Sparsa granulata centro
demum punctata-; sporidiis biseriatis, cy nib reform ibus uniseptatis.

On leaves of *Desmodium.* Ravenel. No. 1503.

Rather large, scattered, granulated, at length pierced in the centre; asci clavate; sporidia biseriate, cymbiform, narrow, uniseptate, -001 long, much narrower than in *D. perispoioides* or *D. grammodes.*

884. **Dothidea simillima.** *B. & Rav.*—Sparsa minor granulata;
ascis angustis ; sporidiis arcuatis utrinque attenuated.

On leaves of the same plant, and under the same number; scattered, smaller, granulated, asci narrow, sporidia hyaline, arcuate, suddenly attenuated at either end as in many *Veuniculario?*, '0006 long. *Dothidea Desmodii,* Curt., on *D. lineatum,* is apparently the same.

* **Dothidea artemisiae.** *Schwein.* — On *Artemisia abrotanum.*
Pennsylvania, Michener. No. 4348.

ISporidia oblong, uniseptate, constricted at the septum, one divi*-sion being smaller than the other, -001 long.

885. **Dothidea ambrosiae.** *B. 8f C.*—Convexa nitida; ascis linearibus ; sporidiis uniseriatis ellipticis hyalinis.

On leaves of *Ambrosia elatior.* Car. Inf. No. 1387. On *A. artemisiafolia.* Alabama, Beaumont. No. 4GG8.

Convex, shining ; asci linear; shorter than the slender para-physes; sporidia uniseriate, elliptic, hyaline.

886. **Dothidea vorax.** *B. % C*—Culmum circumdans cohgesta; ascis linearibus ; sporidiis filiformibus.

On *Panicum.* Car. Inf. No. 1810. Ravenel. On *Uniola.*

Formiiig a black patch surrounding the stem, £ inch long; asci linear, sporidia filiform. Sometimes very irregular, and then *D. pilulceformis,* B. & C. Car. Inf. On *Uniola.* No. 1809. *D. atramentavia,* on the under side of grass leaves. Car. Inf. No. 1657, is probably a form.

887. **Dothidea eupatoxii.** *B. 8f C.*—Erumpens ; elongata irregularis, ascis brevibus.

On stems of *Eupatoria coronopifolia.* Car. Sup. No. 708.

Forming black, thin, irregujar erumpent, granulated patches, an inch or more long; asci short, obovate.

888. **Dothidea picea.** *JS. & C.*—Maculis minutis orbicularibus ; ascis brevibus ; sporidiis angustis cymbseformibus hyalinis.

On'twigs of *Vitis cestivalis.*

Forming little orbicular papillose patches ; asci short, clavate ; sporidia hyaline, narrow, cymbseform.

* **Dothidea fructigena.** *Schwein.*—On apples, which have been lying out all the winter. Car. Sup.» No. 336.

* **Dothidea Ptexidis.** *Fr.*—Rhode Island. Curtis. Car. Inf. Ravenel. No. 1744.

* **Dothidea alnea.** *Fr.*—On *Alnus sermdata.* Pennsylvania, Michener. No. 3490.

Spores linear, -0004 long. Not a true *Dothidea.*

* **Dothidea geogxaphica.** *Fr.*—On leaves of *Prunus serotina.* Car. Inf. No. "2142. Ravenel. On *Nyssa.* No. 3218.

.

* **Dothidea phytolaccae.** *Schrvein.*—Alabama, Peters. No. 546.

* **Dothidea lineola.** *Schrvein.*—On *Hemerocallis.* New

England.
Russell.

* **Dothidea heliopsidis.** *Schrvein.*—On *Helianthus.*
Missouri,
Dr. Engelmann. No. 3680.

* **Dothidea Rhois.** *Schwein.*—On leaves of *Rhus copallina.*
Car.
Inf. No. 3173.

889. **Dothidea scutula.** *B. Sf C*— Orbiculata applanata, cellulis
plurimis globosis ; ascis brevibus.

On the upper surface of leaves of *Laurus Carohniensis.*
Car. Inf. Ravenel. No. 478.

Orbicular, placentseform, containing numerous cells, asci oblong; sporidia immature.

* **Dothiora pyrenophora.** *Fr.*—On *Pyrus Americana.* Mountains. Car. Sup. No. 4463.

* **Sphaeria corticium.** *Schrcein.*— On oak. Car. Sup. No. 706.
New York, Lcvuille.

In original specimens sporidia cymbaeform ; '0011 long. In the Carolina specimens the byssus is not so red as in the original and Leveille's specimens.

* **Sphaeria aquila.** *Fr.*—Car. Sup. No. 107, 303. On ash. No. 769. Car. Inf. On oak. No. 6022. On *Cornus florida.* No. 4972. Ohio.

* **Sphaeria Besmazierii.** *B. $ Br.*—" Cooke Handb.," p. 854.

On birch. Maine, Iiev. J. Blake. No. 6345. Pennsylvania, Michener. On *Comius florida.* No. 4880,

* **Sphaeria foveolata.** *B. # C.*—" Journ. Linn. Soc," x., p. 387.

On prostrate branches. Car. Inf. Ravenel. No. 1358.
Sporidia shaped like seeds of a *Veronica.*

* **Sphaeria acanthostroma.** *Mont.*—On *Acer,* oak and *Myrtea cerijera.* Car. Inf. Kavenel. No. 1320. 1361, 1638, 1829.
Pennsylvania, Michener.

* **Sphaeria tristis.** *Tode.*—Car. Inf. No. 1599. New England.
Sprague. No. 5843.

* **Sphaeria phaestroma.** *31.* <fc *Bur.*—Car. Inf. No. 1569, 2797.

On *Ulmns Americana.* Ravenel. No. 1857. $_m$ Sporidia triseptate,
the two central articulations dark, '00125.-*00] 6 long.

890. **Spheria pezizula.** *B. $ C.*—Peritheciis cupularibus in byssum floccosam nigram insidens; ascis clavatis; sporidiis oblongo-
linearibus curvis pluriscptatis. Car. Inf. No. 1774: Itavenel.
No. 1344. New Jersey. No. 4694.

Perithecia cup-shaped seated on a thin byssus ; asci clavate ; sporidia linear-oblong, about 7-septate. The New Jersey plant differs in having the sporidia clavate with about seven septa, •0013 long.

891. **Sphaeria papilionacea.** *B. §" C*—Peritheciis minutis in byssimi compactaui tenucm insidentibus apice niveis.

On leaves apparently of some rosaceous plant. Car. Inf. No. 6381. Ravenel. No. 1927.

Perithecia minute, seated on a thin compact byssus, their tips white.

892. **Sphaeria Russellii.** *B.* §* *C*—Peritheciis minutis demum
collapsis in byssum compactam tenuem insidentibus.

On leaves of *Mespilus.* Massachusetts, Russell. No. 6399.

Perithecia minute, at length collapsed, seated on a thin byssus, consisting of intricate threads which cover the whole under surface

of the leaf. Unfortunately I cannot find perfect fruit in either of these species, which are very curious.

893. **Sphaeria parietalis.** *B.* <fc *C.*—Pcritheciis cupularibus in byssum parcam insidentibus; ascis clavatis; sporidiis biseriatis oblongis utrinque sub-attenuatis unis^ptatfa, incdio constrictis.

On the inside of a hollow oak. Car. Inf. No. 2192.

Peritbecia cup-sbapcd, seated on a sparing bya»sus ; asci clavate ; sporidia biseriate, oblong, slightly attenuated at either end, so as to be almost biconical, uniseptate, constricted at the septa.

894. **Sphaeria pannicola.** *B. $ C.*—Peritheciis globosis in stroma crassiusculum pilosum fuscum insidentibus ; sporidiis oblongis arcu ■ atis obtusis triseptatis.

On roots of birch. New Jersey. No. 4583.

Perithecia globose, seated on a rather thick brown pilose stratum consisting of straight acute threads ; sporidia oblong, obtuse at either end, arcuate with three septa, '0008 long.

895. **Sphaeria ranella.** J?. a> *Rav.*—Peritheciis globosis collapsis rugosis in stroma tenue insidentibus ; sporidiis caudatis uniseptatis, sursum coloratis.

On *Phttanus.* Car. Inf. Ravenel.

Perithecia globose, collapsing, rugged, seated on a brown stratum; sporidia of two joints, the upper elliptic or pointed dark, the low elongated and attenuated with several nuclei, '005 long or more.

896. **Sphaexia xestothele.** *B. ty- C.* — Peritheciis congestis urn- brino-lanatis, ostiolo nudo perforato, sporidiis fusiformibus uni septatis.

On *Cornus florlda.* Car. Inf. No. 4972.

Perithecia crowded, connected with brown woolly matter ; osti-olum naked, perfoiated, tinged with rufous; sporidia biseriate, fusiform, uniseptate, '0008 long, hyaline.

* **Sphaexia racodium.** *Fr.*—On *Liquidambar.* Car. Inf. No. 1466, 3247.

* **Sphaeria ovina.** On dead wood. New Jersey. No. 4697.

Spcridia linear, sigmoid, '002 long.

* **Sphaeria hispid a.** *Tode.*—On *Jitglans niyra.* Car. Sup. No. 858. Car. Inf. No. 2705. . .

* **Sphaeria canescens.** *P.*—On *Platanus.* Car. Sup. No. **J** 782.

* **Sphaeria strigosa.** *A. Sf S.*—On damp pine wood. Car. Inf.

No. 1610.

* **Sphaeria exilis.** *A. 8f S.*—Car. Sup. On *Prunus serotina.*
No. 701. On *Quercus montana.* No. 928. Car. Inf. On *Cornus florida.* No. 2896, 2732. Eavenel. No. 1814.

* **Sphaeria mutabilis.** *P.*—Pennsylvania, Michener. No. 4385.

* **Sphaeria lignaria.** *Grev.*—Car. Inf. No. 1594, 1800, 25u8.
Virginian Mountains. No. 2348.

Sporidia elliptic, brown, -0004. This is quite distinct from *Sphceria hispida.*

* **Sphaeria pilosa.** P.—Car. Inf. No. 1183. Under the shingles of a roof. On pine. Car. Inf. No. 2165, 2524.

* **Sphaeria cladosporiosa.** *Schwein.*—On *Agaricus salignus.* Sartwell. No. 3076.

Not a true *Sphceria,* though it has much the appearance of one. * **Sphaeria vermicularia.** *Nee*.*—Car. Inf. No. 1219.

897. **Sphaeria orthotricha.** *B, $* C—Peritheciis gregariis pilis longis rectis vestitis ; sporidiis linearibus fuscis 6-septatis.

On decayed *Ntfssa.* Car. Inf. No. 4927.

Perithecia gregarious, but scarcely crowded, clothed with long, straight, acute hairs; sporidia linear, with 6-septa, dark, -002-*m0o2b* long, sometimes slightly curved.

898. **Sphaeria lanuginosa.** *B. Sf C.*—Peritheciis globosis sursum leviter applanatis; basi lanuginosis; sporidiis uniseriatis sub-biconicis.

On *Robinia.* Car. Inf. No. 2618.

Perithecia globose, slightly flattened above, lanuginous at the base ; sporidia oblong, uniseptate, curved, sometimes pointed at either extremity, so as to be biconical.

899. **Sphaeria ootheca.** *B. $•* C—Congregata globosa glabnrescens nitida in macnlam nigram insidens ; ascis obovatis farctis.

On oak. No. 2110.

Perithecia crowded into little groups, globose, seated on a dark spot; asci obovate, stuffed with numerous sausage-shaped minute aporidia.

This is *Sphceria mucida p. rostellata,* Schwein, on *Rhus,* in whose specimen the asci are *001 long. In No. 2110 they are rather larger.

900. **Sphaeria Berenice.** *B. $ C.*—Minima undique villosa ; "ascis lanceolatis ; sporidiis hyalinis oblongis utrinque leviter attenuatis.

On the under side of leaves of *Magnolia macrophylla.*

Minute, ovate, clothed all over with radiant flocci ; asci lanceo late ; sporidia hyaline, oblong, slightly attenuated at either end, or subcymbiform. \

901. **Sphaeria flavido-compta.** B. *$ C.*—Peritheciis ovatis pilis rigidis flavis ornatis ; sporidiis oblongo-ellipticis triseptatis.

On *Ct/i-tfla.* Car. Inf. No. 5021.

Perithecia ovate, black, clothed with rigid yellow hairs ; sporidia oblong, elliptic, triseptate, *0008-001 long.

- 902. **.Spharia cerea.** *B. $* C—Minuta parasitica fulvella ; ascis lanceolatis ; sporidiis fusiformibus plurinucleatis.

Parasitic, on *Sphastia stigma.* Car. Inf. No. 2315.

Minute, globose, tawny; asci lanceolate ; sporidia fusiform, with many nuclei, probably not mature.

NEW BRITISH FUNGI. *By* M. C. COOKB, M.A. *CContimoed from page* 69J

Puccinia Iiiizulse. *Libert. Exs.* 94.

Spots purplish. Sori scattered, somewhat rounded, girt by the ruptured epidermis, amphigenous. Spores brown, elongated, lower cell pyriforni, upper coll subglobose, quadrate or irregular, with a thickened epispore, pedicels long, hyaline.

On living *Luzula.* Darenth.

This is considered the perfect condition of *Trichobasis oblongata, {See* "Handbook.")

Puccinia Cirsii. *Lasch. Rabh. F. Ear.* 89.

UREDO-SPORES.—Sori scattered, pulverulent, brown. Spores globose, cinnamon-brown, granular, at length delicately roughened.

Uredo Cirsii, Lasch. Rabh. F. E. 90.

On leaves of *Cirsium.* Scotland.

BRAND-SPORES.—Sori scattered, dark-brown, cpiphyllous, encircled by the ruptured cuticle. Pseudospores shortly pedicellate, **obtuse, dark-brown.—*Thumen F. Aust?\, No.* 68. *Sacc. Myc. Ven.,* 128.**

On leaves of *Cirsium.* Dupplin Castle, Perth.

Fuckers Fungi Rhen., No. 340. is *Puccinia syngenesiarum,* and not the species published by Lasch.

Peronospora Violae. *D. By. Ann. 8c. Nat. xx.p.* 125.

Effused. Flocci fasciculate, rather short, 2-6 times dichotomous, ultimate ramuli shortly subulate, denexed; conidia ellipsoid, slightly apiculate.

On living leaves of *Viola.* Fordcn. Rev. J. E. Vize.

Apparently lather too close to *Peronospora effusa.*

Ramulaxia Violae. *Fckl. Sym. Myc.p.* 361, *tA.fig.* 26.

Tufts delicate, in orbicular white spots, with a brownish border; flocci very short, simple, fasciculate ; spores cylindrical, obtuse, simple, hyaline.—*Oidiwn fusisporioides,* Fckl. Fungi. Rhen, No. 134.

On leaves of *Viola.* Forden. Sept., 1875.

Spores -008 X *002 m.m.

Ramulaxia Ulmariae. *Coolie.*

Tufts greyish-white, forming irregular ovate or angular spots, mostly circumscribed by the veins ; flocci very short; spores cylindrical, obtuse, simple, hyaline.

On under surface of leaves of *Spircea Ulmaria.* Near Manchester. T. Brittain.

Spores -03--04 x '007 m.m.

GeoglosBiim mlcxoBporum. *Coolie & Peck.* " Mycographia," fig. 11.

Var. **txemellosum.**

Sporidia biseriate, cylindrical, or subfusiform, hyaline, becoming at length faintly 5-7 septate.

On the ground. Rannoch. Dr. Buchanan White. This is referred to the American species as **a** variety, but it seems to be more tremellose than the typical form, and the sporidia do not flow out and cover the surface of the club ; this may be accounted for in that the specimens were not so fully matured. Sporidia '03 m.m. long.

Feziza (Humaxia) Fhillipaii. *Coolie Mycographia ii.,Jig.* 88. Sessile scattered, fleshy, cap-shaped, at length expanded, externally fuliginous, rough ; hymenium, dark vinous, plane, margin sometimes crenulate, sporidia elliptic, attenuated at each end, ver-rucose, paraphyses clavatc, septate. *Ascobolus amethystinus,* Phillips in part.

On sandy ground Shrewsbury.

Sporidia 025 X "Oil m.m.

Peziza (Humaxia) violascens. *Coohe, Mycographia il., fig.* 83. Subhemispherical, violaceous-brown, whitish at the base, seated on pallid rooting fibrils, hymenium plane or convex, asci cyiin* drical. Sporidia globose, uninucleate, granular. Paraphyses filiform. *Ascobolus Persoonii,* Crouan Flor. Fin., p. 56.

Amongst small mosses. Shrewsbury (W. Phillips). Cups 5-7 m.m. broad. Sporidia -008-'009 m.m. diam.

Peziza (Humaxia) lechithina. *Cooke.*

Gregarious, sessile, egg-yellow; cups (5 m.m. broad), hemi-spherical, then flattened, becoming convex; margin narrow, distinct; asci cylindrical; sporidia elliptical, smooth ; paraphyses septate, clavate above, filled with orange granules. *Cooke, Myco-graphia, it, fiq** 89.

On old trunk crossing **a** stream. Sept. Forden. This interesting species is quite distinct from anything hitherto described. Sporidia -025 X -012 m.m.

Peziza (Humaxia) constellatio. *B.* <£- *Br. Ann. Nat. Hist.* Scattered, sessile, red. Cups (1-2 m m.) hemispherical, soon flattened, di&c at length convex; asci cylindrical; sporidia globose, smooth; paraphyses profuse, filiform, filled with orange granules. —*Peziza humosa, Rehm Ascomy. No,* 4. *Cooke, Mycographia, ii, fig.* 81.

On the ground. Hereford (W. Phillips). Kent (M. J. B.). Sporidia '012--013 m.m. The same species was sent us by Professor Saccardo from Italy, under the name of *Peziza humosa.* There is a slight difference in the size of the sporidia from different localities ranging from -011 to -013 mm. diameter. In all there are the same linear granular orange paraphyses, in great number, curved at the tips. Fuckel's *Crouania humosa* has much larger sporidia ("016 m.m), though it is doubtful whether this is sufficient to constitute it **a** distinct species, in the absence of any other difference.

Feziza (Humaxia) pluvialis. *Coohe.*

Gregarious, sometimes densely crowded, rather soft, flesh-colour, or with an orange tint. Cups Q m.m. broad), soon flat-

tened, and plane or slightly convex, with radiating white byssoid filaments at the base ; asci cylindrical; sporidia elliptical, hyaline, smooth ; paraphyses filiform, numerous, distinct, granular. *Cooke, Mycograj)hia,fig.* 90.

On a damp wall. Eastbourne (0. J. Miiller). On wair paper. Chichester (Dr. Paxton).

Sporidia '018 x '008 m.m.

In both instances this *Peziza* was found after the heavy rains in early summer. There is a little difference in the two specimens. The Eastbourne specimens have more of an orange tint, the cups are less crowded, and the white mycelium is more distinct, but the fruit corresponds in both. The Chichester specimens resemble externally some forms of *Ascoholus carneus;* both are rather closely allied to *Peziza Franzoniana,* Not. (Mycographia, fig. 68), but perhaps distinct in the sporidia, and more profuse and decided paraphyses, as well as some other features.

Peziza fSaxcoscypha) copxinaxia. *Coolie in Grevillea iv.,p.* 91.

On cow dung. Jftannoch.

Peziza (3>asyscypha) comitessae. *Cooke.*

Caespitose or single and gregarious, bright golden-yellow, externally paler, and tomentose, stipitate, common stem branching below. Cups at first clavaie, then expanded and cupulate; asci cylindrical; sporidia minute, linear, straight or curved; paraphyses filiform. *Fungi Britt.,y ii.. No.* 371.

On a fallen tree. Dupplin Castle, Perth.

Asci -05 x #006 m.m.; sporidia #006-"0075 m.m. long.

The branching stem resembles that of *Peziza pygmea,* to which this, species is allied; the tufts contain from two to four cups proceeding . from a common stem, or sometimes single. It is an elegant species dedicated to the Countess of Kinnoull, on whose estate it was discovered.

Peziza (Kymenoscypha) monilifexa. *Fchl. Sym. Myc.* 310.

Stipitate, scattered, or csespitose. Cups seated amongst *Bispora^* at first subclavate, at length dilated; disc concave, patellate when mature, marginate, waxy, externally and rather long stem, smooth, pallid brown; disc slightly darker; asci elongated; sporidia biseriate, oblong, attenuated towards each end, but obtuse, at length uniscptate, hyaline; paraphyses filiform, subclavate.

Amongst *fiisjwra monilwides^on* cut timber. Dupplin Castle.

Cups 1-2 m.m. broad, 1-3 m.m. high; sporidia -012 x -004 m.m.

Puckcl has constituted a new genus under the name of *Bispora* for this species, of which he assumes that- *Bispora monilioides* is the couidia form.

Helotium scopaxium. *Coolie.*

Scattered or subgregarious, pallid, sessile ; disc convex, rather paler, whole plant becoming greyish in drying; asci clavate; sporidia cylindrical, obtuse, straight or curved, binucleate, at

length with the endochrome divided; paraphyses simple, filiform, slightly granular.

On dead twigs of broom. Dupplin Castle, Perth.

Cups 1 m.m. broad ; Asci -1 X '02 m.m.; sporidia -02--025 X •005 m.m.

Ascobolus amethystinua. *Phillip%9 Qrevillea iv.t p.* 84.

On damp sandy soil, near Shrewsbury.

Ascobolus crenulatus. *Kar&t. Fung. Fenn. No.* 763.

Gregarious, sessile, at first sphaeroid, then flattened, nearly plane, greenish-yellow, furfuraceous ; margin crenulate (1-5 m.m. broad); asci clavate; sporidia elliptical, striate, violet, becoming brownish ; paraphyses slender.—*KarsU Myc. Fenn. u p.* 77.

On grouse dung. Rannoch. Dr. Buchanan White.

Sporidia -012--016 X '006--008 m.m.; cups about 1-1J m.m. broad ; disc of the Rannoch specimens, vinous when old, retaining the greenish colour at the base of the cups.

Ascobolus (Saccobolus) obscuxus. *Coolie.*

Subgregarious, sometimes densely crowded, fuliginous, hyme-nium convex, rather paler. Asci clavate. Sporidia elliptical, rough, becoming violet, collected into an elliptical mass. Paraphyses linear.

On old sacking. Forden.

Cups £-f m.m. Sporidia -012--014 X "007 m.m.

Ascobolus (Ascophanus) pilosus. ***Fr.***

Minute, sessile, yellow, testaceous-yellow or tawny-orange, ex-ternally pilose with long hairs; disc papillate ; margin naked ; hairs simple, incrassated at the base; asci clavate ; sporidia hyaline, oblong ovate ; paraphyses slender, septate, simple, or branched, granular. *Boud. Mem. p.* 84.

On grouse dung. Rannoch. Dr. Buchanan White.

Cups TLth m.m. broad; sporidia '02 X *01 m.m.

This is referred to *A. pilosus* as a variety, but the specimens were more minute than usual, scarcely visible to the naked eye, pallid. It differs from any form of *A. papillatus* and *A. aliatus,* in the hairs not being marginal but clothing the surface of the cup; they are also more slender than in the other species. It was ac-companied **by a minute *Ryparobius* and *Sphceria (Spororrnia) Notarisiu***

Xylazia Scotica. *Coolie.*

Suberose; stem very long, pallid, root-like, slender, 1-3 times dichotomously branched above ; branches elongated, or very short and fasciculate ; heads elongated, subcylindrical; apex more or less acute, greyish-brown, then black ; perithecia very numerous, slightly papillate ; asci cylindrical; sporidia uniseriate, elliptical, brown, minute.

On the ground. Meihlouer. Mr. Matheson.

Entire length, including rooting base, 2 to 6 inches. Clubs about 1 inch long ; sporidia -005--006 x "003 m.m.

A most interesting addition to the British Flora. It was exhibited at the Perth Fungus Show, and is wholly unlike any described species. The sporidia are smaller than in any other British *Xylaria*. Commonly 6-8 heads arise from the rooting stem.

Valsa lauro-cerasi. ***Tul. Carp.*** **ii. 196.**

STYLOSPORES= *Ceuthospora lauri.*

ASCOPHORE = Perithecia 6-8, disposed in a circle, raising the cuticle, which is sometimes blackened above the swollen clusters; asci clavate ; sporidia narrowly elliptical, small, hyaline, straight.— *Cooke Fungi Britt.* ii. *ined.*

On branches of cherry laurel. Forden.

Not having seen specimens, which are authenticated as the species intended by Tulasne, it is difficult to determine whether our plant is his species. The sporidia are larger, but for the present it seems advisable to include it under his name.

This is interesting from its association with *Ceuthospora Lauri*, which occurred at the extremities of the twigs; passing downwards it was replaced by the *Valsa*, which resembled the former so closely that the two could scarcely be distinguished by a lens. On the older branches the absence of the blackened cuticle caused the resemblance to be less perfect. Asci '04 m.m. long; sporidia •01--012 mm.long.

Sphceria (Spoxormia)Notarisii. ***Car. Rabh.Fung.Eur.*** **976 b.**

Perithecia black, rather shining, ovoid or rounded; ostiola wart-like or mamillaeform; asci cylindrical, octosporous; sporidia tetra-merous, brown, not apparently surrounded by a hyaline coat.— *Hedwigia,* 1868,/?. 69, *t. l,Jig.* 1.

On grouse dung. Rannoch. Dr. Buchanan White.

Sporidia -022-026 x '004:--005 m.m. ; segments of the Bporidia '005-006 m.m. long.

Sphoeria (Sordaria) curvula. ***D.By. Morph. Pilze,p.*** **209.**

Perithecia scattered, superficial, or rarely semi-immersed, oblong-conical, rngulose, densely clothed with articulate fasciculate brown hairs; asci broad, cylindrical, stipitate ; sporidia ovate or elliptic, dark brown, with hyaline terminal appendage; paraphyses articu-lated, longer than the asci.—*Sphcerta stercorarai*, Fungi Britt. i. "589.

On cow dung. King's Lynn (C. B. Plowright). Rannoch (Dr. Buchanan White).

JSporidia *029 X '015 m.m., without appendage,

Sphceria (Denudatae) ostioloidea. ***Cooke.***

Gregarious. Perithecia minute, black, subglobose, with a slight papillate ostiolum, seated on the stroma of *Diatrype:* asci cylindrical, narrow; sporidia uniseriate, linear, straight, minute, hyaline.

Parasitic on *Diatrype quercina.* Forden.

Quite different from *Sphceria nigerrima.* The perithecia are very

minute, looking like the ostiola of the *Diatrype.* Asci '04 X '004 m.m; sporidia -008 m.m. long.

Xiophium fusisporum. *Coolie.*

Perithecia subsessile, expanded upwards, conchiform, laterally compressed, black, shining, striate. Asci subcylindrical. Sporidia fusiform, multiseptate (about 7) yellowish.—*Lophium mytilinum. Cooke Fungi, Britt. ser. ii.*$_9$ 200.

On fir branches and bark.

Sporidia -05 m.m. long. I have now no doubt that the true *L. mytilinum* has filiform sporidia the length of the ascus, as described in " Handbook." Specimens from Dr. Capron, of Shere, and in Fiedler's " Exsicc." are of this character. Fuckel's No. 762 in my copy is sterile.

DESCRIPTION OF PLATE LXIV.

Fig. 1. Specimen of *Xylcuria Scotica,* natural size. „ 2. Section of portion of club. „ 3. Aacua and sporidia X 500.
„ 4. Asci and sporidia of *Sphceria ostiBloidea* X 600. „ 5. Asci and sporidia of *Valsa lauro-cerasi* X 500. „ 6. Ascus and sporidia of *AscoboVus crenulatus,* with free sporidia X 500. „ 7. Ascus and sporidia of *Ascololus (SaccdbolusJ ohscwrus,* with froe sporidia X 500. „ 8. Threads and spores of a variety of *Helrmnthosporium echinulatum,* on *Ornithogalum* X 500.
„ 9. Spores of *Badhamia fulvescens* X 500. „ 10. Afecus and sporidia of *Pezizo Comitessw* X 500. „ 11. Spores of *Clasteo-isporium vermiculatum* X 500. „ 12. Ascus and sporidia of *Peziza Phillipsii* X 500. „13. Ascus and sporidia of *Helotium scopcuriwn* X 500. „ 14. Threads and spores of *Vertidllium tunwrum* **X** 500.

SOME INDIAN FUNGI.

By M. C. COOKE, M.A.

Septozia Axtocarpae. *Coolie.*

Pcritheciis aggregatis in maculis brunneis orbicularibus insiden-tibus. Sporis minutis lincaribus.

On leaves of *Artocarjnis intcgrifolea.* Mysore.

Spots orbicular, brown ; perithecia dark brown, flattened, with an apical pore; spores minute, linear, about '01 min. long.

Diplodia Catappse. *Cooke.*

Peritheciis globosis, primo tectis, dein erumpentibus; sporis variabilis, demuni septatis, atro brunneis, utrinque subnucleatis.

On nuts of *Terminalia Catappa.* Pondicherry (1862).

The perithecia are soon erumpent. Spores very variable in

shape and size, becoming uniseptate and dark brown, at first with a globose nucleus in each cell.

Hendersonia Lonicerae. *Coolie.*

Peritheciis gregariis, minutis, primo tectis, atris; sporis ovatis, oblongisve, brunneis, endochromatis 2-3 divisis.

On twigs of *Lonicera diversifolia.* Saharunpore (Dr. Jameson).

The perithecia are very minute. Spores not constricted at the septa, 2-3 partite.

Pestalozzia palmarum. *Coolie**

Erumpens, atra, gregaria vel sparsa ; pustulis sphaeriasformibus ; sporis fusiformibus quadriseptatis, pallide fuscis, triaristatis, stipite elongatis, hyalinis.

On dead sprout of cocoa-nut. Bengal (precise locality unknown). Jan., 1870.

Spores *015 x '005 m.m., fusiform, with 4-septa, pale brown, the ultimate cells hyaline, crested with three hyaline setae.

, TTstilago pulveracea. *Coolie.*

Pulverulenta, atrobrunnea; , sporis globosis, granulatis Tel sub-reticulatis, brunneis.

On male florets of *Zea Mays.* Lahore (Dr. J. L. Stewart).

Pulverulent, occupying the male florets, but very different in habit from *U. Maydis*. Spores globose, brown, rather large, with **a** granulated epispore, '015 m.m. diam.

Uxomyces hetexogenis. *Coolie.*

Hypophylla. Soris dense aggregatis in maculis suborbicu-laribus, purpureo-brunneis ; pscudosporis subglobosis, ovatis, obo-vatis, vel pyriformibus, variabilis, pallide fuscis, longe pedicellatis.

On leaves of *Hibiscus.* Kolapore, Bombay (Col. Julian Hobson).

The sori are densely aggregated in suborbjcular patches, of **a** dark purplish-brown colour. Pseudospores very variable, sub-globose, ovate or pear-shaped, -01-#02 X '017--03 m.m., on very long slender peduncles *06 m.m. long.

Uromyces sphaeropleum. *Cootie.*

Hypophylla. Soris parvis, sparsis, orbicularibus, atro-brunneis; pseudosporis globosis, subopacis, longe pedicellatis.

On leaves, apparently of *Ononis*. Kolapore, Bombay (Col. Julian Hobson).

The sori are minute and scattered ; pseudospores globose, rather opaque, dark brown, -017--022 m.m. diam., on long slender pedicels, "05 m.m. long. The dark globose opaque spores are very peculiar, resembling those of *Pileolaria.*

TJxomyces Hobsoni. *Vyse.*

Caulicola. Soris irregularibus, in tuberculis magnis, scleroti-formibus collectis, rubro-brnnneis; pseudosporis compactis, ob-longis, longe pedicellatis.—*Rev. J. E. Vize, in litt.*

On stems of *Jasminum.* Kolapore, Bombay (Col. Julian Hobson).

Forming compact buliate pustules on the stems, with the appear-

ance of reddish-brown sclerotia; pseudospores compact, oblong, brown, on long hyaline pedicels.

PucciniaKur distant. *Coolie.*

Hypophylla. Soris in inaculis suborbicularibus, aggregatis; pseudosporis magnis, elongato-ellipticis, leniter constrictis, fuscis, breviter pedicellatis.

On *Taraxacum glaucum.* Koordistan.

Sori collected in suborbicular spots in a manner similar to those of *P. glomerata ;* pseudospores large, elongated, elliptical, slightly constricted at the septum, brown, -05 X "025, much larger than in ***P. glomerata, P. chondrillce*** **and allied species.**

Puccinia rostxata. *Cooke.*

Published in " Grevillea " iii., p. 75, under the name of *P. cruci-ferarum ;* but as that was previously appropriated by Hudolphi, the present name must be substituted.

On *Cruciferce.* Himalayas.

Kemileia vastatxix. *B. $ Br.* [il] Gardener's Chronicle," Nov. 6, 18G9,

■with fig.

On coffee leaves. Mysore.

This pest was first described from specimens communicated from Ceylon. Although less destructive to the coffee plantations in Mysore, it has now established itself on the Continent of India.

Isaxia stellata. *Qocike.*

Nivea, stellata, incrustans. Floccis tenuissimis, circinatis.

Encrusting dead insects attached to the under surface of mango leaves. Mysore.

Snow white, encrusting minute insects, and assuming the appearance of stellate bodies, about 1 line in width. Threads very delicate circinate, sigmoid or variedly curved. (Spores not seen.)

Pellicularia. *Gen. Nov.*

Parasitica. Floccis repentibus ramosis, septatis, in pelliculciin sub-gelatinosam intertextis. Sporis sessilibus, simplicibus, hyalinis. Hab. On living plants.

Pellicularia koleroga. *Cooke.*

Hypophylla, effusa, griseo-alba, sporis globosis, hyalinis, echinulatis.

On under surface of leaves of *Coffea arabica.* Mysore.

Effused in large greyish white patches, sometimes nearly covering the under surface of the leaves; threads creeping, branched, septate, interwoven into a subgelatinous pellicle, which can be' stripped from the leaf when moist. Spores sessile, scattered over the threads, globose, hyaline, echinulate "0075 m.m. diam. Very destructive in coffee plantations, wliere it is known under the name of " Kole-roga," or black,rot. Probably allied to *Amphiblistrum.* . Corda.

Clasterispoxium maculatum. *Coohe,*

Epiphylla. Maculis orbicularibus, velutinis ; sporis fasciculatis, arete clavatis, ad basim attenuatis, supra atro-brunneis, inferne hyalinis, multiseptatis.

On leaves of *Ficus cordifolia.'* Kolapore, Bombay (Col. Julian Hobson).

Forming orbicular spots J inch broad. Spores fasciculate, narrowly clavate, *'08* X "006 m.m., dark brown above, hyaline below, seated on the creeping mycelium, with from 7-9 septa, which at length become obscure. Clearly congeneric with *Clasterisporium* *caricinum,* Schw.

Glenospoza didyma. *Cooltc.*

Epiphylla. . Maculis atris, irregularibns, subconfluentibus; floccis repentibus, ramosis, divaricatis, lateraliter papillatis ; sporis ellipticis, brunneis, endochromate bipartitis.

On fading leaves of some undetermined plant. Kolapore, Bombay (Col. Julian Hobson).

Forming irregular black patches on the upper surface of the leaves. Threads creeping, brown, branched, divaricate, with lateral papilla[1], to which the spores are. attached ; spores elliptical, *016-•018 X "009 m.m., brown ; endochrome bipartite.

In the original diagnosis of this genus the spores are characterized as globose ; but the Rev. M. J. Berkeley does not regard this as an essential character of his genus, which will have to be modified accordingly, as all the features of the present species indicate its close affinity with *Glenospora melioloides,* B. & Curt. ; even to the curious discoid bodies composed of radiating flocci, the relation of which to the creeping threads has not yet been accurately determined. Probably they are the early stages of the sporiferous threads.

Bothidea pexispoxioides. ***Berk. $ Curt.*** **" North American Fungi,'[1] *Grerillea* iv.**

On leaves of some leguminous plant. Bombay (Col. Julian Hobson).

Sporidia brown, uniseptate, constricted, each extremity attenuated.

Chaetomium Indicum. *Cor da.*

On paper. Burmah.

Eurotium herbariorum. ***LinL***

Common, on various substances. Bengal. Chittagong. Burmah.

Capnodium mangifefum. ***O. 8f Broome.***

Effusum, velutinum; poridiis ovatis pyriformibus vel lageni-formibus; sporidiis arete ellipticis, hyalinis, uniseptatis. On leaves of *Mangifera Indica.* Mysore.

Effused, forming, a velvety stratum on both surfaces of the leaves. Peridia ovate or pear-shaped, or flask-shaped '075--08 m.m. long; sporidia hyaline, uniseptate about '0125--015 m.m. long.

DESCRIPTION OP PLATE LXIII.

Fig. 1. Threads and spores of *Pellicularia Koleroga* X 500. „ 2. Portion of thread and spores further magnified. „ 3. Pseudospores of *Uromyces sphceropleum* X 500. „ 4. "Pseudospores of *Uromyces heterogenvm* x 5G0. „ 5. Spores of *Ustilago pulveracea X* 500. „ 6. Pseudospores of *Puccinia Kurdistani* X 500. „ 7. Pseudospores of *Puccinia rostrata* X 500. „ 8. Portion of stem with sori of *Uromyces Hobsoni.* „ 9. Pseudospores of *Uromyces Hobsoni* X 500. „ 10. Spores of *Clasterisporium maculatum* X"500. „ 11. ThreadR and spores of *Glenospora didyma* X 500. „ 12. Discoid body accompanying the threads of *Glenospora X* 500. „ 13. Conidia and peridium of *Capnodium-Mangiferum X* 500. „ 11. Asci and sporidia of same X 500. „ 15. Free sporidia of *Capnodium mangiferum* X 500.

NEW AND RARE BRITISH FUNGI. *By*

WM. PHILLIPS and CHARLES B. PLOWRIGHT.

{Continued from Vol. III., p. 126, *with plate* 62.]

31. **Hygrophorus mucronellus.** *Fr. Hymen, Erwrop. p.* 418. *Fr. Ep.*

p. 331.

Fragile, pileus submembranaceus, conico-campanulate, acute, smooth, bright-red, becoming pale, stem fistulose, thin fibrous, somewhat silky, base white, gills decurrent, triangular, thick, yellow.

In a grass field by the sea bank. Kings Lynn. Dec, 1875, in company with //. *russo-coriacem*. Probably not uncommon.

32. Paxillus paxadoxus. *(Kalclib.) Berk. Kalclib. Fung. Evvg. t.* 16,

***fig-* 1.**

Spores *0006 x '0002 in., with a nucleus at each end.

The Rev. M. J. Berkeley considers this a *Paxillus.*

Wrekin, Salop, Sept, 1875. * **Sistotxema confluens.** *Pers.*

A curious and interesting form of this plant occurred at Hereford this year, it was for the most part stemless, incrusting sticks, leaves, fragments of earth, etc., extending into the holes made by the bun-owing of some animal, either a mole or a rat,' some of the best developed specimens growing subterraneously upon the roof of the burrows.

33. Stereum pint. ***Fr. Hymen. Evrop. p.* 643. *Fr. Fp. p.* 5C3.**

Resupinate coriacco-cartilaginous peltato-ndnate submarginate, smooth beneath, pallid, at length bullate, hymenium purple, flesh-coloured, then brownish, pruinose.

Growing upon the under side of dead branches of *Pinus*

sylvestris, while they were still attached to the tree. North Wootton.

34. Corticium typhae ***Fckl. Symbol. My col. p.*** **27. Athelia typhas,** ***Pers.***

My col. Uurop. p. 8 K

Longitudinally effused, thin, then quite smooth, very pale tan-coloured.

On *Typha latifolia.* North Wootton, 1874.

Almost invisible when dry.

• **Solenia fasciculata.** ***Fr.***

, This occurred on dead Salix, near Shrewsbury, Jan., 1876.

*** Phallus iosmos.** ***Berk.***

This plant occurred abundantly on the sand hills by the sea shore at Scratby, near Yarmouth, in November, 1874, from whence the Rev. Kirby Trimmer kindly sent us specimens; after a very careful examination we were unable to differentiate these specimens from various forms of P. *impudicus* we have met with either by habit, colour, or odour ; one specimen only had a reddish tinge upon the stem, several of the older ones were blackened by some *Cladosporium.* Mr. Trimmer, however, says—'* I have had the opportunity of testifying to the appropriateness of the specific name of [c] iosmos,' though, in the midst of these specimens, I found them by sight and not by scent. In getting them up from the sand, they yielded a pleasant violet odour, and it was not until the third day after gathering that they became offensive." Rev. M. J. Berkeley, to whom specimens were sent, says, " doubtless the plant of *Curtis*[9] *Entomology* [y] but it is very doubtful whether it is a species."

35. Dinemaspoxium fimeti. ***n. sp.***

Excipulum subrotund, superficial, black. Spores appendiculate, •0003 exclusive of appendage. Smaller and more compact than *D. graminum,* Lev., with much smaller spores.

On rabbits[1] dung. Kings Lynn, 1874.

PI. *62* fig. 1. Spores.

36.Excipula petiolicola. ***Fckl. Symb. Mycol.p.*** **400.**

Perithecia scattered, minute, hemispherical or oblong; black cup-shaped when dry.

On the petioles of Tilia. Ringstead, Ap., 1872.

37. **Torula pinophila.** *Chev. Ilabh. F. E., No.* 1668. *Cooke's Funa*

Brit. 2nd edit. fas. IV. No. 335. On *Abies pectinata.* Dolgelly, North Wales. June, 1875.

38.Gymnospoiriuni Physcise. ***Kalclibr. Szep. Gomb. Jeb. No.*** **856.**

On the apothecia of *Physcia parietina.* Common about King's

Lynn, but we have, never seen it upon any other lichen.

39. **Puccinia acuminata.** *Fckl. Symb. Mycol. p.* 55.

On *Galium saxatile.* Montgomeryshire. Rev. J. E. Vize.

40. Uzomyces Betas. *Kuhn in But.Zeitg.* 1869, *sp.* 540. *Fuckel.*

Symb.

Mycol. 64. On *Beta vulgaris*,
doubtless the advanced condition of *Tricho-*

basis betce, Lev., from^which it may readily be distinguished by the naked eye from the darker colour of its pustules. Kings Lynn, October, 1875.

41. Fusidium cylindricum. *Corda Fucltel 8t,mb. Mycol. p.* 371.

On green but fading leaves of *Lapsana communis,* Mr. T. .Brit-tain, 1875. Agreeing with Continental specimens from Dr. Geo. Winter, etc.

42.' **Fusisporium Kiihnii.** *Fckl. Symb. Mycol. p.* 371.

Mycelium arachnoid, white, effused. Hypha thin, branched, septate, matted, then vanishing ; conidia in little heaps, subregular, lunate, uniseptate, hyaline.

Overrunning mosses, lichens, etc., on the bark of trees, frequently about Kings Lynn, but by no means always in a fruitful condition.

43.**Ramularia vairiabilis.** *Fckl. Symb. Mycol. p.* 361.

Csespitose, spreading, thin, white, on a brownish or greenish spot. Hypha fasciculate, flexuous, very short; conidia hyaline, very various, ovate, obovate, elliptical or cylindrical.

On fading leaves of *Digitalis purpurea.* Mr. T. Brittain.

44.Vibrissia Guexnisaci. *Or. Ann. des Sc. Nat. Vol. vii.,* 1857, *e. i.* ^

Very small, 1-3 millm. in diameter, sessile, gelatinous, lentiform or turbinate, slightly brown beneath; hymenium plane or convex, white, greenish-yellow or ochery-yellow, pale grey or bluish-grey; asci /usually straight, containing 8 uncoloured Bporidia, which are longr filiform, curved, much attenuated, and excessively slender; paraphyses numerous, articulated, presenting one to three chain-like bifurcations, the terminal cells being round or pear-shaped, and larger than the others ; sporidia about •0038 in. long.

On the inner side of dead bark of willow. Shrewsbury. Nov., 1875.

45. **Peziza (Humaxia) semi-immersa.** *Karst. Myc. Fenn. I., p.* 45.

Phillips, EL Brit., No. 60.

Sub-gregarious, sessile, half immersed in the earth, at first sub-sphacrical, then hemisphserical, at length expanded, applanate, very slightly pubescent, or becoming glabrous; margin crenulato-unequal, pallid, ochraceous, or incarnato-tcstaceous, epithecium darker; asci cylindracio-clavate; sporidia ellipsoid, one or two nucleate, *016-'024 X '09--011 m.m. ; paraphyses articulated; apices curved and unequal.

On damp earth. Shrewsbury.

* **Peziza (Sarcoscyphae) melastoma.** *Sow.*

A single specimen was found at Whitfield," near Hereford, in May, 1875.

* **Peziza (Sarcoscyphae) sepulta.** *Fr.*

Terrington, St. Clements, Norfolk (C. B. P.). Nov., 1874.

46. Peziza (Dasyscyphee) palearum. *Desm. Ann. Sc. Nat.* 184G. *Crypt de Fr. Exs.* U., *No.* **917.** ***Phillips, El. Brit., No.*** **68.**

Minute, scattered, stipitate, whitish-tawny, acetabuliform, then plane, externally furfuraceo-tomentose, ciliated round the margin; disc ivory; stipes rather long, dark brown at the base ; asci small, cylindrical; paraphyses large, acute at the summits; sporidia "01-•013 X "002 m.m.

On straw. King's Lynn (C. B. P.). On *Psamma arenaria*. Towyn, North Wales. June, 1875.

47. **Peziza (Dasyscypha) luzulina.** *Phillips. Grevillea^VolAv^pl.* 51, *fig.* 266.

Gregarious or scattered, shortly stipitate, minute, white, pubescent ; disc pale yellow, plane, margined; asci clavate; sporidia 8, fusiform, straight or slightly curved, -0005--0008 x -0002--00025 in.; paraphyses linear.

At the base of dead leaves of *Luzulina sylvatica*. Conway, North Wales.

48. **Peziza (Dasyscypha) friabilis. n.s.**

Scattered or congregated, sessile, when young globose, then hemispherical,, externally whitish, minutely pubescent, concave, brittle; margin fractured, uneven; disc testaceous ; asci cylin-draceo-clavate; sporidia, 8, filiform, -06 X '001 m.m., multiscptate; paraphyses slender.

On dead oak branches, growing on the woody fibre only. Dol-gelly, North Wales. . June, 1875.

PLATE 62, FIG. II.—1, natural size of plant; 2, a cup magnified; 3, asci and paraphyses"; 4, sporidia.

49. **Peziza (Dasyscyphae) flam me a.** *A. $ 8. Consp.p.* 319, *t.* 11,/. 7. ***Phillips, El. Brit., No.*** **72.**

Gregarious or scattered, sessile, hemispherical, strigoso-villous, dull red throughout; sporidia oblong, simple or spuriously uni-septate, '01--016 X "OO25-'OO35 m.m.; paraphyses slender.

On *Salix aurita.* Aviemore, N.B. (Rev. J. Keith).

50. **Peziza (Dasyscypha) miliaris.** *Wall?:*

Sessile, scattered, minute, becoming pallid, externally thinly pruinose, immarginate, same colour as the disc, which becomes somewhat convex; asci clavato-cylindrical, '002 x -0003 in. ; sporidia 8, oblong-ovate, '0004 **x** '00015 in.

On the upper side of *Peltigera canina*. North Wootton. Nov. 15, 1875.

* **Peziza (Tapesia) Bloxami.** *B. fy Br.*

On dead wood. Near Barmouth, North Wales. June, 1875.

We were unable to find fruit in our specimen, and are indebted to Dr. Cooke for confirming our determination.

51. **Peziza (Mollisea) litoralis.** n.s.

Sessile, scattered or crowded, minute, black ; disc dark brown, concave ; margin incurved, fractured ; asci subclavate ; paraphyses

linear ; sporidia cylindrical, narrow, enucleate, straight, or slightly bent, -025 X '002 m.m.

On dead wood washed up from the Loch. Lynwilg, Scotland (Rev. J. Keith).

PLATE *62,* FIG. IV.—1, natural size of plant; 2, cups magnified; 3, asci and paraphyses ; 4, sporidia.

52. Feziza (XVEollisea) mauxa. n.s.

Scattered, sessile, at first globose, becoming patellatc, sooty-black ; margin raised, crenulate; asci clavate, elongated, and narrow below; paraphyses curved at the summits ; sporidia narrowly fusiform, with five to scven,nuclei, 'OS-'OSS X •OO5-'OO6m.m.

On dead wood. Dinmore, Hereford. Oct., 1875.

PLATE 62, FIG HI.—1,natural size of plant; 2, cups enlarged; 3, cells of exterior of cup x same as sporidia; 4, asci and paraphyses; 5, sporidia.

53. **Feziza (Mollisea) retrusa.** n.s.

Minute, scattered, at first concealed by the epidermis, then erumpent, sessile, hemispherical, or oblong, straw-coloured, smooth; asci clavate ; sporidia eight, biseriate, oblong-ellipsoid, •017 --019 X '005-*006 m.m. ; paraphyses not visible.

On needles of larch. Trefriw, North Wales. May, 1874.

When dry this is found with difficulty, as it becomes contracted, and conceals itself under a kind of lid formed of the ruptured epidermis; but when moist it is sufficiently conspicuous under a pocket lens. It should stand near *Peziza erumpens*$_v$ Grev.

PLATE 62, FIG. VI.—1, natural size of P. *retrusa;* 2, the same, much enlarged; 3, ascus ; 4, sporidia.

54. **Peziza (BXollisia) ulcer at a,** n.s. *Phillips, El Brit., No.* 83.

Scattered, erumpent, stictieform, then patellate; margin fractured ; disc dirty-orange ; asci clavate, tetrasporous ; paraphyses enlarged at the summits, simple or forked, often-contorted; sporidia ovate, granular within, *015 x *008 mm.

This is allied to P. *fusarioides,* Berk., and P. *assimilis,* C. & P.; but differs from both in the much larger sporidia, and having only four in each ascus.

On *Aster tripolium.* Kings Lynn (C. B. P.). Sept., 1875.

PLATE 62, FIG. V.—1, natural size of plant; 2, the same magnified ; 3, asci and paraphyses ; 4, sporidia.

Since the foregoing was in type, we have discovered that the same species is described by Berk. & Br. in Ann. Nat. Hist, as *Pez. Tripolii.*

55. **Feziza (Mollisia) arenevaga.** *Desm. Ann. Sc. Nat.* 1852. *PL*

Crypt, "i/., *No.* 517. *Phillips*[1] *El Brit,, No.* 84.

Erumpent, minute, scattered, of a soft waxy consistency, glabrous, sessile, when young globose, then plane, externally

tawny, with a somewhat tumid tawny elevated margin, which is black when dry; disc watery, nearly white, when dry brown ; asci

clavate, subcylindrical, erect amongst simple paraphyses ; sporidia eight, oblong-ovoid, hyaline, obtuse at the ends, '015 X '005-'01 m.m.

On *Psamma arenaria*. North Wales, 1874. Scotland (P. Currey, Esq.).

56. **Stictis sexiata.** *IAb. Phillips, El Brit., No.* 100.

Cups innate, punctiform, orbicular, plane or but slightly concave, disposed in approximate series, rubro-fuscous; asci linear, in-.cluding 6-8 globose, minute, hyaline sporidia.—*Fckl.*

On *Carex ampullacea*. Forres, North Britain (Rev. J. Keith).

* **Stictis lichenicola.** *Mont.*

The Rev. W. A. Leighton received specimens from Ireland of this doubtful *Stictis,* and kindly communicated them to us.

57. Hypocxea contort a. *Berh. $ Curt.* Sphaeria contorta, *Schiveinitz*

Synopsis, p. 191, *No.* 1224.*

Subrotund, fixed to the matrix by the central portion, spreading, becoming thin towards the margin, where it is free and variously lobed, dark olive-green externally, yellowish-white within ; peri-thecia minute, globose, confined to the upper surface; asci "003 in. long; sporidia, 16, sphaerical, with a central nucleus, '0002 in.

On a rotten oak stick. Foxley Woods. Oct., 1875.

A very interesting addition to our flora, and agreeing exactly with American specimens received from Mr. J. B. Ellis.

58. **Hypocreopsis pulchra.** *Winter. Hcdtrigia,\&lf>yp.2Q. Sphariacei*

Britannici Cent, ii.. No. 100.

Compound. Perithecia 1 to 3, immersed in the elliptical verru-cseform, or irregular, fleshy, red stroma, which is covered on the surface by a reddish down; ostiola erumpent, darker; asci oblongo-ventricose, subsessile, 4 to 8 spored ; sporidia crowded in the ascus, broadly elliptic, simple, hyaline, -002 X '0008 in.

Near Shrewsbury, on sheep dung, 1874 ; on cow and sheep dung, Terrington, St. Clements, 1875.

59. **Nectria peltigerae.** *Ph. % PI.*

Nectriella carnea, Fckl. Symb. Mycol. p. 176. *Cryptodiscus Lichenicola,* Ces. in Kl. Herb. Myc. ii, 523.

On the living thallus of *Peltigera canina,* in company with and usually following its conidia, *Illiosporium cameum,* Fr. Castle Kising, Nov., 1875.

Fuckel is undoubtedly right in classing this plant with the *Nectriece,* both on account of the perithecium and also by reason of the fruit.

60. **Sphaeria (Sordaria) merdazia.** *Fr. Fr. Elench.il. p.* 100.

Copvolepa merdaria, Fckl. Symb. Mycol. p. 240. *Sordaria merdaria,* Winter. Sord. p. 13, t. 7. f. 1. Sphaeriacei Brit. ii. No. 56.

Perithecia single or in groups of 2 or 3, surrounded by a stroma,

which is black, shining, and semi-immersed m the matrix;

perithecia rugulose, dark brownish-black, shortly conical; ostiola obtuse; asci elongato-cylindrical; sporidia 8 ovate, simple, or with a nucleus, opaque, black, surrounded by gelatin, •001 x -0004 in.

On horse dung, Terrington St. Clements, 1874. On rabbits' dung, Kings Lynn, 1875.

61. **Sphaeria (Sordaria) Equorum.** *Winter. Sord. p.* 13,*. 7. *fig-* 2. *Goprolepa Equorum*, Fckl. Symb. Mycol. p. 240. Sphseriacei Britannici ii. No. 57. Cooke Fungi, Britt. ii., 241-2.

Perithecia scattered, in a thin subcoriaceous crust-like stroma on the surface of the matrix, covered with a dark brown villosity; ostiola black, somewhat conical; "*asci cylindrical, octosporous ; sporidia uniseriate, ovate, or oblong, black, simple, surrounded by a gelatinous envelope, -0007 X '0003 in.

On horse dung. North Wootton, Shrewsbury. Grevillea vol. ill., t. 42, fig. 7.—a, section of fungus enlarged ; *bj* sporidia ; c, ascus and paraphysis. 62 **Sphaeria parmeliarum.** n. sp.

Superficial perithecia, small, black, crowded, somewhat shining, smooth ; ostiola minute but distinct, papillreform; sporidia eight, triseptate, elongated, somewhat constricted, pale brown, usually uniseriate, rarely 4-septate, 001 X '0005 in.

Growing parasitically upon *Parmelia saxatilis,* on a living spruce fir tree, Dolgelly, North Wales. June 22, 1875 (Rev. W. A. Leigh ton).

PLATE *62,* FIG. VIII.—I, natural size; 2, asci; 3, sporidia.

63. **Sphaeria (Diaporthe) resecans.** *Nice. NitscJike Pyren. Germ. p.* 314. *Sjfhceriacei Brit. ii.f No.* 43.

Elongated, bursting through the bark longitudinally ; perithecia, minute, globose, or slightly depressed; ostiola very small, short; asci clavate or oblong, octosporous; sporidia biseriate, obtusely fusiform, straight, hyaline, bipartite, 2-4 septate, somewhat constricted, -0004 in. x "0001 in.

On *Syringa vulgaris.* Terrington St. Clements, 1874.

64. **Sphaeria (Diaporthe) pinophylla. n. sp.**

Perithecia scattered, sometimes two or three in a group, seated beneath a widespreading black crust, immersed in the,.matrix; ostiola elongated, abruptly truncate at the apex; asci -001 in. long; sporidia biseriate, hyaline, acute, quadrinucleate, then uni-septate, -007 x -0002 in.

On decaying fir needles *(Pinus sylvestris),* Belmont, Hereford. May, 1875.

PLATE 62, FIG. VII.—1, natural size ; 2, a perithecium magnified; 3, ascus ; 4, sporidia.

ON PEZIZA BRUNNEA, *A. $ S.*

By M. C. COOKE.

It is very difficult to determine with accuracy many of the species of fungi described by old authors in the absence of authentic specimens. When specific characters depend nearly entirely on microscopic features, the difficulty becomes almost an impossibility. Since the species of *Peziza* have been subjected to microscopical examination, the limits of species have been more clearly defined, and it is by no means unusual to find that two or three forms, greatly resembling each other in external features, but widely different in fruit, have been confounded togetheT under one name. An instance of this kind we had occasion to point out a short time since in the case of *Peziza caJycina,* and now a difficulty presents itself as to the *Peziza brunnea,* Alb. & Schw.

In this instance we have a *Peziza* belonging to the group *Sar-coscypha* and a close ally of *Peziza hemispherical* but much smaller. A careful perusal of the description given in the Conspectus, combined with the coloured figure, will convey a pretty accurate idea of the external features of this *Peziza.* It is from one to three lines broad, of an elegant brown colour, clad externally with scattered fascicles of hairs, but not truly ciliate, of a csespitose habit, expanded when mature, with the margin inflexed. For a long time, and by many authors, a small *Peziza* has been referred to this species, which Dr. Rehm has called *Peziza gregaria,* and Dr. Nylander *Peziza liemisphcerica* var. *minor.* Doubtless it was this which was published by Desmazieres (No. 1312) as *Peziza brunnea,* and since then many have followed his example. It was this form which we had in view as *Peziza brunnea* when the " Handbook of British Fungi" was written.

There are some features in which the above-named species corresponds with the *Peziza brunnea,* A. & S.; but sufficient attention was not paid to their figure, which has a brown hyme-nium, and, also, to that important phrase in the description, " uni-color, eleganter brunnea," whereas, in the *Pezizd gregaria,* Rehm, the disc is of a livid or pale watery grey, and not in the least brown. At a period when the colour of the disc in *Peziza* was regarded as alone of specific value, it would not have been possible for Schvveinitz to have described and figured a species with a brown disc, when it really had a pallid one. Hence we cannot regard the *Peziza gregaria,* Rehm, as the *Peziza brunnea,* A. & S

It is very probable that the *Peziza proximella;* Karst. (Monogr, p. 125), *Peziza hcemispherica* var. /3, *proximella,* Karst. (Myc. Fenn. p. 69), is the same as the *Peziza bmnnea, Desm.* (not A. & S.), and the *Peziza gvegaria,* Rehm, A comparison of the figure given by Sowerby (pi. 369, ^*g.* 1) as *Peziza hybrida* will be found to correspond with Alb. & Schw. figure of *Peziza brunnea,* and not with *Peziza gregaria.*

Recently another *Peziza* has been referred to *Peziza brunnea,* A. & S., with some greater reason, since it has a bright clear brown disc, and is about the same size as that indicated in the *iC* Conspectus." It is this which Dr. Nylander (ObseiT. p. 21) names *Peziza biiinnea;* and ^ilso Karsten (Myc. Fenn, p. 75), with spherical sporidia from '013-p017 m.m. diameter. We received the same species from the United States, and applied thereto the name of *Peziza confusa* (U.S. Discomycetes), under the impression that there was no evidence to show that this species was known to Albertini and Schweinitz, or that it exists in any old collection, or has been met with at all until very recently. Although in colour this species approaches the figure given in the *• Conspectus," this feature cannot be accepted alone; for we have received from Hungary, through the kindness of Professor Hazslinzzky, a brown terrestrial *Peziza* under the name of *Peziza brunnea,* which has elliptical sporidia, somewhat incurved margin, but not distinctly hairy externally, and much smaller than 1-3 lines.

Until more distinct "evidence can be afforded of the identity of Karsten's species with that described by Albertini and Schweinitz, we deem it much more consistent to retain the name of *Peziza con-fusa>* which we applied to it provisionally, than to take for granted that it is the true *P. brunnea* of which we still have grave doubts. As far as we are awarejio brown hairy *Peziza* corresponding with Sowerby's figure has been found in Britain since his time. The nearest approach to it is a pale condition of *Peziza umbrorum,* which is sometimes found with a flesh-coloured disc. Hitherto we do not find that *Peziza confusa* has Beon recorded at all in the west of Europe, or any where near where the *Peziza brunnea,* Alb. & Schw., was found and figured.

We are, therefore, content to hold the true *Peziza brunnea* in abeyance, and not to accept any of the species which have been referred to it in recent times, in the hope that some more conclusive evidence will be forthcoming in the future to identify and establish this lost species.

LICHEN PILULABIS,' DAV.

Can any lichcnist inform me what this lichen really is ? The Hook. Herb, at Kew has two specimens under this name, which once belonged to Dr. Withering. One of them, which externally admirably Tescnibles the fig. of *L. pilularis,* in " Linn. Trans.," Vol. ii, p, 283, tab. 28, fig. 1, proved, on microscopic examination, to be undoubtedly *Lecidea contigua,* Fr., and the other as certainly to be *rl raclnjlia-tympanella,* Fr. The genuine *L. pilularis,* Dav., remains yet to be deciphered. Is the Eev. Hugh Davis's herbarium in existence; and, if so, where preserved ?

W. A. LEIGHTON.

PUBLISHED FASCICULI.

The great number of published Fasciculi of Cryptogamia which have been issued during the past year, and are being continued in the present, has caused us to come to a decision as to the publication in this Journal of lists of species contained in such fasciculi. With every desire to assist the energetic cryptogamists who are issuing these fasciculi, it would be clearly impossible to publish lists extending to at least a thousand species in one number of " Grevillea;" and to publish some and exclude others would be manifestly unjust. Hence we have resolved not to publish lists of any of the Fasciculi which are issued on the Continent; but, professing as this does to be a British Journal devoted to the interests of British Cryptogamists primarily, we reserve to ourselves the liberty of publishing lists of the Fasciculi published in Great Britain, should we at any time consider such a course desirable. This explanation is necessary in order that it may be understood by our correspondents abroad that the publication of British lists cannot be accepted as a precedent for the insertion of lists of the species contained in Fasciculi *not* issued in Great Britain.

RABENHORST'S LICHENES EUROPCEI EXSIOCATI.—We would call attention to the publication of the xxxvth fasciculus of this work, which has recently appeared, and contains numbers 926 to 950.

REHM'S CLADONIEX, Fasc. ii., has also just appeared; and the Rev. W. A. Leighton informs us that the specimens are, as in the former fasciculus, exceedingly excellent, both in quantity and preservation, and are carefully mounted and named after the latest authorities and revisions. The reactions are noted as found. The fasciculus contains fifty specimens, from number 51 to 100.

PROF. GUDEMAN'S FUNGI NEERLANDICI, Cent, i., has appeared since our last issue, and is valuable as illustrating the Mycologic Flora of a portion of Europe, from whence no collection has previously issued.

SACCARDO'S MYCOTHECA VENETA, Cent. iv. to vii., have also been published, equalling the previous centuries in quality and quantity. Although we cannot agree with Professor Saccardo as to the advisability of adopting a host of the modern genera, and holding peculiar views as to the limits of some others, in such a work as the present, where he has no means of explaining his views, his collection will be acceptable. We need go no further for an illustration of our meaning than the first three specimens: No. 301, *Periconia chlorocephala,* Fres.; No. 302, *Periconia pycnospora,* **Fres. ; No. 303, *Sporocybe byssoides,* Bonord (non Berk.). It is not every mycologist who has so strong a faith in Bonorden's infallibility.**

LECANORA ANGULOSA, (SCHREB.) ACH.

This lichen has lain hid amid *L. subfusca* and *L. albella,* but may be distinguished by the epithecium of the apothecia becoming of an opaque yellow with hydrate of potash, precisely similar to the reaction of *L. glaucoma.* This peculiar reaction in *L. angulosa* was pointed out by Dr. Nylander in his Lich. Pyren. Or. in the " Flora." It must, therefore, be separated from *L. subfusca* and *albella,* and rank as a distinct species in the section with *L. glaucoma.* Two varieties of it have been made by Acharius and others, distinguished by the apothecia being distinctly margined, or with the margin obliterated and the apothecia becoming convex or even hemispherical. But the original describerof the lichen (Schreber) in his " Spicilegium," p. 136, evidently includes both varieties as only states, and, indeed, the transition may be readily traced on many specimens. Mr. Roper sent me (Nov., 1874) a specimen gathered by him at Eastbourne, for determination, which proved on testing to be *L. angulosa.* This set me to an examination of my herbarium, and I discovered that I possessed specimens from Norway, Sweden, Lombardy, Eastern \Pyrenees, Italy, and Tasmania. In " Exsiccata" it is represented by Sommerf. Crypt. Norv., 64; Anzi Langol., 103 ; Anzi Ital. Sup., 178 (left hand specimen) and 179; Coemans, 322; Mudd. 114 and 115; Nyl. Pyren. Orient., 19 ; Borrer's Herb, at Kewhas it from Sussex and United States of America, but, with these exceptions, it is absent from the " Hook. Herb." I gathered it in 1850 at Loppington, Shropshire, and in 1873 at Nesscliffe Hill, Shropshire. Mr. W. Phillips collected it in 1875 at Westbury, in Shropshire. No doubt it will now be detected generally throughout England.—W. A. LEIGIITON.

NOTE UPON THE RIMULARIA LIMBORINA, NYL.

M. Leighton supposes, relying upon the authority of M. Th. Fries, that this lichen is only the *Lecidea troches,* Tayl., and that the *Lecidea inconcinna,* Nyl., also belongs to the same species. Having at hand the specimens upon which these two species and the genus Rimularia itself have been established by M. le Dr. Nylander, in the interest of truth I feel called upon to interfere, as M. Leighton contends with an opinion which I believe to be quite erroneous. Thus, as two cryptogamists, also versed in the 6tudy of the lichens, having committed this error, it must be admitted that the specimens submitted to their examination were not authentic, nor like mine, as I concluded immediately on the first look at the figure of a cut of the apothecia of *Rimularia limborina* given by M. Leighton; because in this genus the thalamium is completely enclosed in a conceptacle, the superior part of which is

cloven in an irregular manner, in place of opening by a rounded pore as in the *Verrucaria,* or by a radiated star, as in the genus *Limboraria.* But after the rimular dehiscence, the superior parts of the conceptacle, although divided into angles sometimes slightly regular, are none the less continued in a very evident manner, and without any line of demarcation with the inferior part of the same conceptacle. It is not, therefore, necessary, in order to explain the origin, to have recourse to a pretended epithecium which may be formed by the summits of the thecse and of the paraphyses swell ing, altering, and bleaching. A similar epithecium exists at times upon the disc of the apothecia of the *Lecidea inconcinna,* as M. Nylander has remarked, but not in the *Rimularia limborina.*

Bourges. **DR. RIPART.**

FORM OF RHYNCOSTEGIUM.

A very beautiful form, not, I think, recorded as British, occurred in Derbyshire. *Rhyncostegium rusciforme*$_{y}$ var. *inundatum,* Bry. **Eur. It is probably only a form of *Hypnum ruscifolium,* Dil. Right bank of the Wye, in a clear spring near Chee Tor; July, 1875.** **H. H. HIGGINS.**

STENOGRAMME INTERRUPTA, Ao.

A note has been published by Dr. Perceval Wright, in correction of the notice of this species by E. M. Holmes, in "Grevillea" for December, 1874, on four points, (1) that the tetrasporic fruit had not been recorded as occurring in Britain ; whereas in Harvey's " Nereis Bor. Amer." (part ii., Mar., 1853) it is described from specimens (a) from Somersetshire, *(b)* from Cork Harbour. (2) That it is not described in any recent works on Algaa in Britain; whereas a description will be found in Harvey's " Phycologia Australica," as well as the work above alluded to. (3) That no figure of the tetraspores had been published ; whereas, in pi. cexx., figs. 2, 3, 4, 5 of Vol. iv. of Harvey's " Australian Algee," they will be found. (4) That no notice was taken by Dr. Harvey of specimens sent to him by Miss Gifford, in 1848; whereas the letter and specimens are in the Herbarium of Trinity College, Dublin, and the priority of Miss Gifford's discovery of the tetraspores is fully acknowledged at p. 169 of Part II. of the " Nereis Boreali-Americana." Finally, as the specimens figured in " Grevillea," pi. xxxvii. are stated to have been gathered in Scotland, it would be interesting to know from what part, as this would be the most northern habitat as yet known.

" FUNGI BRITANNICI."'

MEMORANDA ET CORRIGENDA.

18. Diplodia Syring®. *Awd.* with *Sphceria.* **Niessl remarks in Hedwigia (1876, p. 2), that this belongs to FuckeFs genus *Otthia,* one which we see no grounds for accepting as a tenable genus-.**

72. **Ustilago Candollei.** *Tul. '*

This Niessl also states in Hedwigia (1876, p. 2), is *Ustilago Candolleu* The spores of *U. utriculosa* are rough, whilst those of *U. Candollei* are smooth, as in specimens published in No. 72.

133. **Puccinia amphibii.** *Fold.*

There appears to be good grounds for the separation of the form of *Puccinia* which occurs on *Polygonum ampliibium* from that which is found on *Polygonum convolvuli,* retaining for the latter the name of *Puccinia Polygonorum,*

141. **Tzichobasis Primulce.**

(Lev.) 142. **Tzichobasis Xxidis.**

(Lev.)

146. **Uromyces Ulmaziae (?).**

This is clearly not an *Uromyces.* It requires examination in a fresh state, for which we have not yet had an opportunity, but suspect that it will be found to be a *Coleosporium.*

162. Cezcospoxa Resedce. *Fckl.*

187. Peziza hixta. *Sch.*

Issued in error as *P. scutellata,* for which see " Mycographia," part ii.

200. **Iiophium* fusisporum. C.**

True *Lophium mytilinum, Fr.,* has quite different fruit.

206. **Physazum. tussilaginis. *B. 8f Br.***

Berkeley and Broome (Ann. Nat. Hist, xvii^ (1876), p. 139), having found what they regard as the genuine *Badhamia cap-sulifera*$_y$ have applied to this species the above name.

323. Tfredo ozchidis. *A. $ 8.*

Clearly not the same species as the *Uredo confluens* which occurs on *Mercurialis.*

360. Helminthosporium variabile. *C.*

This is very closely allied to *Helminthosporium echinulntum*$_y$ B. & Br. The Rev. M. J. Berkeley regards it as the same species.

ATLAS DER DIATOMACEEN-KUNDE.

Since our last notice of this work, three more parts (6, 7, 8) have been published. Part 6 is occupied by various forms of Surirella (many of them new species), and as far as we have means of judging by comparison with our examples, they are accurately delineated, some of them particularly so. We especially note the following:—*S. elegans,* E. *(Campy lodiscus elegans,* Ralfs = *S. slesvicensis,* Granow, *S. alpina,* Donkin), *S. robusta (S. nobilis,* Smith), *S. cardinalis,* Kitton (this species is referred to *S. guate-malensis,* Ehr., by Professor H. L. Smith and Herr Q-runow; according to the former authority this species is also identical with *S. limosa,* Bailey (not Bright well).

S. pyrifoimis, n. sp., Kitton, is a British species, first detected in a gathering from the Firth of Tay, by Mr. Kattray, of Dundee.

S. hastata — S. contorta, Kitton. Several very curious and beautiful new forms, obtained from Demarara river mud, are figured on plate 23, figure x. ; plate xxii. is not *S. turgida* of the Synopsis.

Plate xxiv. contains some excellent figures of *S. striatula* from various localities.

The total number of forms figured in the six parts is 872.

Part 7 contains 299 figures of *Amphora,* these, on the whole, are not satisfactory; they - will, however, enable the student to identify many species of this genus.

Part 8, pi. xxix. is a continuation of PI. 1, and contains the following figures of *Actinoptychi:—A. Pfitzeri, A. heterostrophus, A. areolatus*$_{\gamma}$ *A. boliviensis, A. hexagonus, A. JSimbirsTcianus, A. seduc-tilts, A. campanulifer.* There are also several figures given, of what the author terms " Regeneration valves " (our secondary valves), he considers these to belong to *A, areolatus.* Mr. Roper originally described these valves as a new species under the name of *A. hircidiatus,* but a further examination of them, as occurring in a gathering from Gorleston, Suffolk (Herr Schmidt's drawings are made from specimens found in this material), satisfied him that they were portions of *A. undulatus,* of British observers. *A. areolatus,* as given in the " Atlas," seems to be only a more robust state of figure 8, which the author calls an inner valve.

In plates 30, 31, 32, we find 62 figures of species of that very beautiful genus *Aulistus,* many of them very characteristic, but the most skilful draughtsman is unable to do full justice to the exquisite sculpturing of these tiny discs. No drawing has ever represented faithfully the beautiful markings on *Auliscus racemosus,* or the parted appearance of *A. pruinosus.* The former species was figured and described by Herr Janisch in his work on the microscopic forms in guanos, under the name of *A. Stockhardtii,* and as this is the older name, it must be retained. A good figure is given of this species in the « Atlas," as is also of *A. Orevillei,* also figured and described in the before-mentioned work. Whether

this specifically is distinct from *A. Moronensis* is, perhaps, questionable.

Amongst the new species given is the very curious *A, Clevet,* and several figures of Grunnow's *A. confluens,* a form very near to *A. *pruinosus.*

The author has constituted a new genus (Pseudauliscus) for the reception of those forms with the central smooth space (" zu Pseudauliscus rechne ich alle Auliscen ohne sculpturlose Area.") To this genus would therefore be referred the following forms:—
Auliscus Peruvianus, „ radiatus, „
notatus, „ ovalis, „
Ralfsianus, and perhaps Fenestrella
Barbadensis.

F. KITTON, Norwich.

CARPOLOGY OF PEZIZA.

***By* M. C. COOKE.**

***[Plate* LXV.]**

Fig. 275. Peziza tuberosa, *Bull,* Cooke Fungi Britt. ii. 183.
„ 276. P. ciborioides, *Fr.,* Rabh. Fungi Eur., 619.
„ 277. P. sclerotionun, *Lib.,* Libert exs., 326.
„ 278. P. Bclerotiacea, *Ces.,* Erb. Critt. Ital., 339.
„ 279. P. gracilipes, *ElUs,* ex. herb. J. B. Ellis.
„ 280. P. Curreyana, *Berk.,* fide Currey.
„ 281. P. Fncheliana, *D'By.,* fide Dr. Bary.
„ 282. P. imberbis, *Bull,* Fckl. Fungi Rhen., 1148.
„ 283. P. albumina, C. *fy P.,* ex. herb. Peck., No. 292.
„ 284. P. hymenula, *Fckl.,* Fckl. Fungi Rhen., 2470.
„ 285. P. sepium, *Desm.,* Desm. exs., No. 2006.
„ 286. P. sordida, *Fckl.,* Fckl. F. R., 2078.
„ 287. P. echinophila, *Bull,* Cooke Fungi Brit, ii., 367.
„ 288. P. pseudo-tuberosa, *Relvm.,* Rehm. Ascomy, 106.
„ 289. P. caucuB, *Reb.,* Rab>u F. Eur., 1222.
„ 290. P. bulgarioides, *Rablu,* Rabh. F. Eur., 1008.
„ 291. P. renispora, *Ellis,* ex. herb. J. B. Ellis.
„ 292. P. luteo-virescens, *Desm.,* Desm. exs., 1541.
„ 293J P. cyathoidea, *Bull,* Erb. Critt. Ital., 587.
„ 294. P. coronata, *Bull,* Cooko Fungi Britt. ii., 379.
„ 295. P. campanula, *Nees,* Rabh. H. M., 419.
„ 296. P. nana, *Sacc,* ex. herb. Prof. Saccardo.
„ 297. P. albida, *Lesm.,* Desm. exs., 2004.
„ 298. P. Persoonii, *Mong.,* ex. herb. Greville.
„ 299. P. minutissima, *Blox.,* ex. herb. Bloxam.
f, 300. P. fucata, C. *8f Ph.,* ex. herb. W. Phillips.
„ 301. P. denigrans, *Fckl.,* Fckl. F. Rhen., 2193.

MYCOGRAPHIA.

The second part of " Mycographia " is nearly ready, and will contain coloured figures and descriptions of and following species, VIZ

81. **Peziza** (Humaria) constellatio, *[B. $ Br.* var.
82. " Fuckelli, C.
83. " violiacen9. C.
84. " endocarpoides. *B.*
85. " hepatica. *Batsch.*
86. " viridibrunnea. *Oes.*
87. " Jungermanniffl. *Nees.*
88. " Phillipsi. C.
89. " lechithiua. *G.*
90. " pluvialis. *O.*
91. " axillaris. *Nees.*
92. " pilif era. C.
93. Wynnea gigantea. *B.*
94. " macrotis. *B.*
95. **Feziza** (Sarcoscypha) coccinea. *[Jacq.*
96. " occidentalis, *Schw.*
97. " floccosa. *Schw.*
98. " mirabilis. *Bors.*
99. " radiculata. *Sow.*
100 " ammophila, *D. R. Sf [Lev.*
101 " **alphitodes, *B.* <fc 0.**
102 " **tomentosa. *Schw.***
103 " **melastoma2 *Sow.***
104 " hirtipes. 0.
105 " stygia. *B. $* C.
106 " pusio. *B. $ C.*
107 " radiculosa. *[B. $ Br.*
108 " Colensoi. *B.*
109 " **semitosta. *B.* <fc *G.***
110 " pubida. JB. # C.
111 " *l&nnginom .Bicll.* var. *[Sumneriv* B.
112 " sepulta. *Fr.*
113 " fusicarpa. *Gerard.*
114 " geaster. *B $ Br.*
115 " hemispLaericd. *Wiaa.*
116 " tenuis. *Fckl.*
117 " arenosa. *Fckl.*
118 " **areaicola, *Lev,***
119. **Feziza XSarcoacypha) pellita, r *a.* <t p.**
120. " nigrella, P.
121. " arenosa. var. [Bloxami, C
122. " flavovirens, *Fckl.*
123. " gregaria. *Rehrn.*
124. " confusa. *C.*
125. " f uscoatra. *Reb.*
126. " brunnea. *A. $S.*
127. " miniata. *Fckl.*
128. " birta. *Schum.*
129. " trechispora. *Carr.*
130. " geneospora. *B.*
131 " scutellata. *Linn.*
132. " Margaritacea. *B%*
133. " setosa. *Nees.*
134. " Kerguelensis. *B.*
135. " stictica. *B.*
136. " cameo sanguinen. *[Fckl.*
137. " umbrata. *Fr.*
138. " umbrorum. *Fckl.*
139. " livida, *Schum.*
140. " eriuaceus. *Schw.*
141. " albospadicea. *Grev.*
142. " olivascens. O.
143. " vitellina. P.
144. " Cubensis. *B.*
145. " Texensis. *B.*
146. " Lusatiae. *C.*
147. " Btercorea. P.
148. " alpina. *Fckl.*
149. " coprinaria. O.
150. " scubalonta. C.
151. " theleboloides. *A. $8.*
152. " rubra. C.
153. " Dalmenienaia. C.
154. " pulcherrima.Crouan.
155. " albotecta. *B Sf C.*
156. " luteopallens. *Nyl.*
157. " albocincta. *B & G.*
158. " monilifera, *B,*

The third part is intended to be published about the first week in September next.

The following corrections should be made in Part i, *fig.* 68 :—

Page 38—for *Peziza Fa/rnzoniana,* read Feziza (Hmnaria) Franzoniana.
Page 22—under *Peziza convexella,* for "glabra, convoxiuscula," read "glabra, subcitrina, convexiuscula."

AFFINITIES OF PELLICULARIA.

In the present number (pp. 116) we have briefly characterised and described a new genus, and type species, of parasitic fungi, without any detailed account of either, or the reasons which have led to this step. The parasite in question is found on the under side of coffee leaves, and is known to natives as " Koleroga," or " black rot." It appears as an effused greyish-white patch or spot, often covering half the under surface of the leaf. When moistened the whole fuugus may be removed by a knife, and stripped off like a thin film of goldbeater's skin. It consists of an interwoven layer of hyaline, branched, septate threads, on which are sealed, at irregular intervals, globose, echinulate spores. The whole is invested with a kind of gelatinous medium, which compacts it into the above-mentioned film. The threads are from *005 to '0075 of a millemetre in diameter, and the spores are about equal in diameter to the threads on which they are borne. Owing to the investing medium, it is exceedingly difficult to separate one thread from another, or to obtain a free spore. By the use of a colouring medium they can be discerned *in situ,* and sometimes a thread may be disengaged so that tho spores may be seen attached ; but this is of rare occurrence. This constitutes a new form of Coffee Disease. \The principal scientific question which presents itself in relation to this disease is tho relationship and alHnity of tho fungus which we have described. Two or three suggestions have already been offered on the subject; although made without any microscopical examination of the plant itself, they are worthy of a passing notice. One suggestion is that the supposed fungus may be an imperfect condition of some Lichen. It may be true that low forms, or imperfect states, of Lichens are sometimes found on the living leaves of growing plants ; yet the structure is hardly such as those Lichenoid bodies assume. Considerable emphasis is sometimes placed on the presence of gonidia in the lichen thallus as distinguishing it from fungi. There is no manifestation of such bodies in the present instance, and it would be more satisfactory for such an objection if a similar authentic instance could be adduced of a destructive leaf-parasite, which is an undoubted Lichen. Another suggestion has been offered, that it may be a low form of Hymenoniycetous fungi. If so, it should at least give some indication of its relationship. As spores are undoubtedly present, there should also be basidia, bearing these spores in pairs or quarternate; at least, there should be some evidence of an approach to such low H\menomycetal forms as *Exobasidium* or *Hymenula.* Probably it was some such organism as *Exobasidium* which was thought of when this suggestion was made, and, certainly, we can observe no relationship whatever between them.

The conclusion at which we have arrived, appears to us the most tenable one, that the fungus in question belongs to the *Hyphomy-*

cetes or moulds. In habit, and external appearance, it strongly reminds one of the white mould which precedes many species of *Erysiphe,* such as the one so common on peas in the autumn, or that which precedes *Uncinula* on the leaves of the maple. Even under the microscope, there seems to be some kind of relationship ; the interwoven, septate, colourless branched threads are present, but there is an addition of a somewhat gelatinous medium which binds the threads together into a pellicle. The spores and their mode of production is different, and this, in the *Hyphomycetes,* is a most important distinction. In *Oidium* the spores are produced in chains, in the present species singly. It is very true that the structure, as seen in a drawing, resembles closely that of some species of *ZygodesmuSy* but there is a peculiarity in the threads of many of the species in that genus that the threads are cut, as it were, nearly through at short distances, or abruptly bent, of which there is not the slightest indication here. The spores are very similar in size and form, but there are two or three features, which appear to us conclusive for rejecting the coffee rot from this genus. In all the species of *Zygodesmus* the threads are free from any investing medium, the spores are pulverulent, and, moreover, the threads are more or less coloured. Further than this, all the species occur on dead wood or leaves, and in no instance is a species parasitic on living leaves. Although too much reliance is not to be placed on this fact, it is nevertheless noteworthy that genera in which species are parasitic on living plantB, thcro is seldom an excoption to this rule, and so in genera which contain species fqund on dead substances, parasitic species are not found. In illustration of the **former, we may cite *Peronospora, Bamularia*$_f$ and *Erysipke;* and of the latter, *Dactylium, Sporotrichum,* and *Zygodesmus.***

The presence of the gelatinous element which binds together the threads and spores into a thin pellicle, which is easily separable from the matrix when moist, is an important feature in determining the affinities of the " Coffee Rot." In the genus *A7nphiblis-ti-um* of Gorda, there is said to be such a gelatinous" medium. In many species of *Fusisporium* there is something of the same kind. In *Alytosporium,* as constituted by Link, and in some other genera, allied to *Sporotrichum.* Still from all these, there are such manifest points of divergence, that no one would venture to associate the present species with any of them. Hence no other course appeared to be open to us but to constitute *Pellicularia Koleroga*-the type of a new genus allied to those just alluded to, but distinguished therefrom by its parasitic h,abit, sessile, echinulate, globose spores, and the freedom with which it separates from the matrix. Whether or not mycologists will accept this as a sufficient distinction, the present course has not been adopted without much consideration.

GERMINATION OF THE SPORES OF *HEMILEIA VASTABRIX*.

The germination of this curious fungus has not as yet been observed in Europe; but Dr. G. H. K. Thwaites, of Ceylon, has given the results of his experiments on germination. He says that it is not difficult to induce germination. Mature spores removed from a diseased leaf, and laid upon charcoal, kept constantly moist, commence to germinate in a few days. This process consists in the spore becoming somewhat enlarged, and its contents converted into one or more globose translucent masses. From each of these a filament is developed, which grows very rapidly, and becomes more or less branched. At the termination of some of these branches secondary spores are produced in the form of radiating necklace-shaped strings of little spherical bodies of uniform size, and this form closely resembles the fructification of an *Aspergillus*. Another observer in Ceylon (Mr. Abbay) has seen another form of secondary spores arranged in simple rows of spherical bodies—a good deal larger than those radiately arranged, but still exceedingly minute. These inconceivably numerous secondary spores may be easily transported by the slightest breath of air from place to place, and from plantation to plantation. Messrs. Berkeley and Broome have intimated that this fungus seems to hold an intermediate place between Uredines and Moulds. The germination, as well as structure of the species, is thus seen to be very unique and interesting.

BOTANICAL YEARBOOK.

The issue of the commencement of the " Botanischer Jahres-bcricht" for its second year, offers an opportunity for calling attention to a work which combines an immense amount of labour in a most useful form for all botanists, but it is the Cryptogamical portion which it is our desire more especially to commend to the attention of our readers. The second volume before us is for the year 1874, containing the Botanical Literature for that year, arranged under different heads, each under the special direction of an expert. The first section, Algae, consists of forty-one large octavo pages, containing an enumeration of works, papers^ communications, and the names of species published during the year. The second section is devoted to Lichens, and consists of 143 pages, grouped under Literature, Systematic Lichenology, Lichenography grouped under countries, Morphology, and New Genera and Species. In fact a much more extended and complete subgrouping is adopted under these heads than we have space to enumerate. The third section is occupied with Fungi, extending to about 170 pages, with a similar sub-classification to that adopted with the Lichens'

and of this section more especially, as the one with which we are practically best acquainted, we must speak in terms of strong commendation. The fourth section includes Mosses, thirty pages; and the fifth section, the higher Cryptogams, completes 426 pages of compact information on the Cryptogamic Literature of the year. It could hardly be expected that such a work could be produced "within a less period than one year from the completion of the year included within its scope. The whole of the year 1874, for instance, has been put into shape, classified, arranged, analysed, tabulated and printed during 1875, so that it may be distributed to subscribers as early as possible in 1876. It is a book which no one, who would attempt to keep pace with the Literature of any group of Cryptogamia, could afford to do without, and a sovereign thus expended, would save a vast amount of individual labour, which it is presumed all specialists would employ, in keeping a record of such papers and communications as came to their knowledge, with the additional advantage of its being better done. It is under the general editorship of Professor Leopold Just, and Js published in Berlin.

THKEE FUNGI FROM KASHMIR.

By REV. M. J. BERKELEY, M.A.

The following three Fungi were sent to the Kew Museum by Dr. Aitcheson :—

1. **Russula alutacea,** *Fr. Bp.p.* 362.

Gulmarg, Kashmir. In the woods during the rains. August 1875.

2. **Lentinus Lecomtei,** *Fr. Ep. p.* 388 *(Agaricus Lecomtei.* Schwein Car. No. 794.)

On decomposed wood during rain. Eaten by the natives. Gulmarg.

The specimen sent in its dry state is about 21 inches across but it is stated to grow in large masses, and is sometimes twenty times as large. The species occurs in the United States, and has been gathered by Leveille in Hungary, who has described it under the name of *Agaricus Sainsonii* (Deinid. Voy, tab. 1, fig. 3). I have a specimen gathered by my son in Hungary. The vernacular name is Silry.

3. **Hydnum Aitchesoni,** i?.—Pilcis imbricatis pallidis subtiliter tomentosis glabratis; margine inflexis lobatis fissis; stipite com-muni centrali crassis, quandoque obsoletis; acuteis tenuibus longis fuscescentibus, decurrentibus.

Gulmarg, 8500 feet. ^ Sept., during **the** rains. Esculent. Vernacular name, Ryle-gub.

About three inches across when fresh, extremely polymorphous ; pilei at first minutely tomentose, at length quite smooth, often much* imbricated, with the margin inflexed and split; stem sometimes quite obsolete, sometimes distinct, ^-J inch high, \ iuch thick, pallid like the pileus ; aculei ^ inch long, acute and slender, somewhat decurrent when the stem is present. Not so common as the last.

It is curious that the *Eussvla* is not considered esculent, though an esteemed culinary species in Europe.

FAIRY RINGS.

In a recent communication to the Linnean Society Dr. J. H. Gilbert draws attention to the fact that, according to published analyses of various fungi, generally from one-fourth to one-third of their dry substance consists of nitrogenous matters. In fact, fungi would appear to be among the most highly nitrogenous of plants, and to be also very rich in potass. Yet the fungi have developed in " fairy rings " only on the plots *poorest* in nitrogen and potass in such conditions as to be available to most other plants. They flourish strikingly on two plots only, in neither of which either nitrogen or potass is applied as manure, on which the development of grasses is extremely restricted, and their limited growth is due to a deficient available supply of nitrogen, or of potass^ or of both, and, where the completion of the Legu-minosae is also weak, in the absence of a more liberal supply of potass.

The questions obviously arise whether the greater prevalence of fungi under such conditions be due to the manurial conditions themselves being directly favourable for their growth, or whether other plants—especially grasses—growing so sluggishly under such conditions, the plants of the lower orders are the better able to overcome the competition and to assert themselves. On this point the further questions arise, whether the fungi prevail simply in virtue of the absence of adverse and vigorous competition, or whether to a greater or less extent as parasites, and so at the expense of the sluggish underground growth of the plants in association with them ; or, lastly, have these plants the power of assimilating nitrogen in some form from the atmosphere, or in some form or condition of distribution within the soil* not available (at least when in competition) to the plants growing in association with them.

NEW FORMS OF BRITISH LICHENS.

In the " Transactions of the Glasgow Society of Field Naturalists," Dr. James Stirton has described the following new species and varieties of British Lichens :—

Physcia retrogressa.
Physcia tenella var. fimbriatula.
Lecanora atra (*) sub-byssoidea.
Lecanora mammillifera.
Lecidea aniptila.
Lecidea confertula.
Lecidea phyllodisca.
Lecidea asperella.
Lecidea Braedalbanensis.
Lecidea corollidia.
Lecidea calpodes.
Lecidea restricta.
Lecidea relicta.
Lecidea hemipolielld (Nyl.) semialbula.
Opegrapha atricolor.
Arthonia insinuata.

In addition to which are some extra-European species from Canada, Tasmania, Australia, &c.

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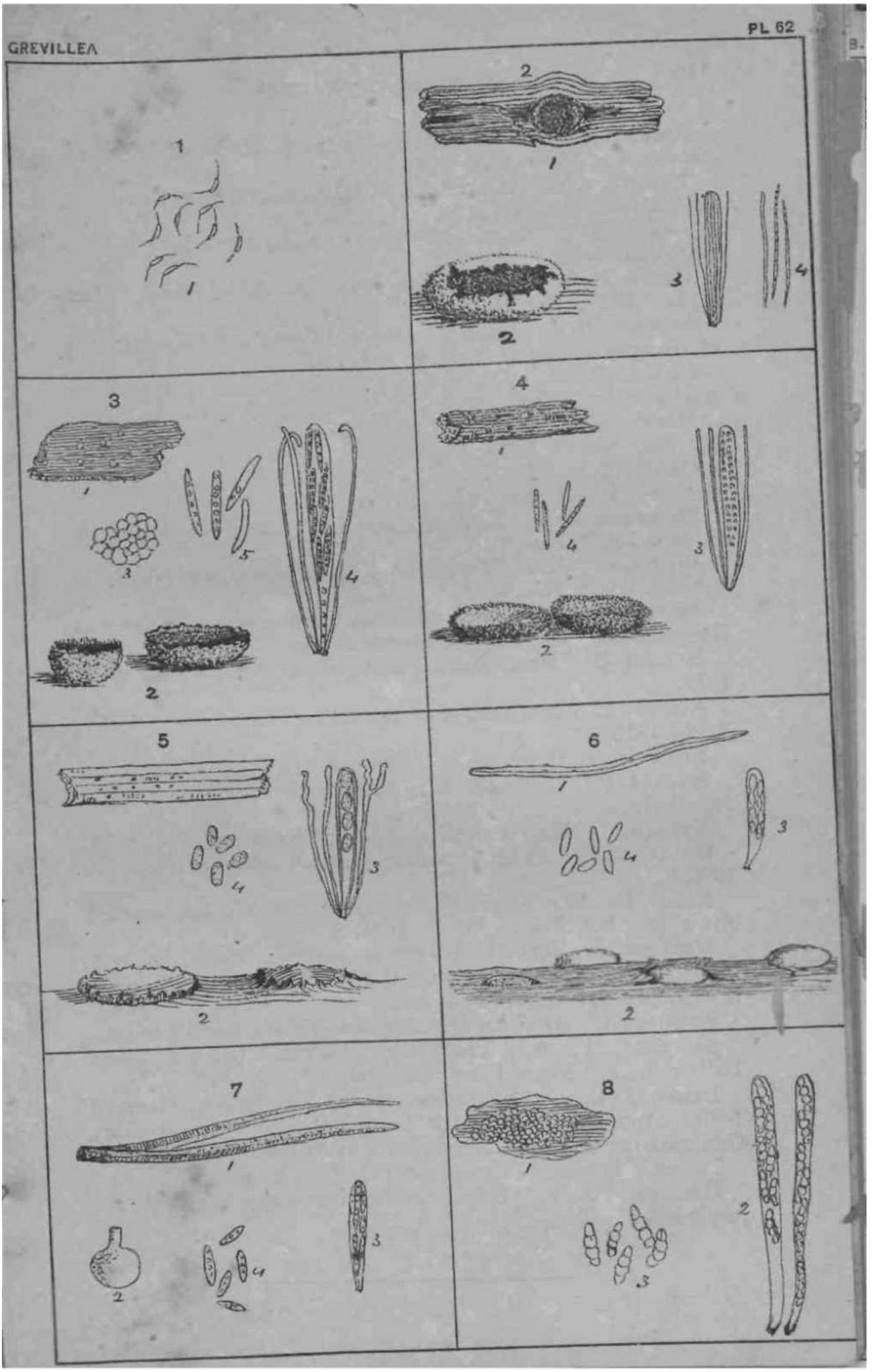
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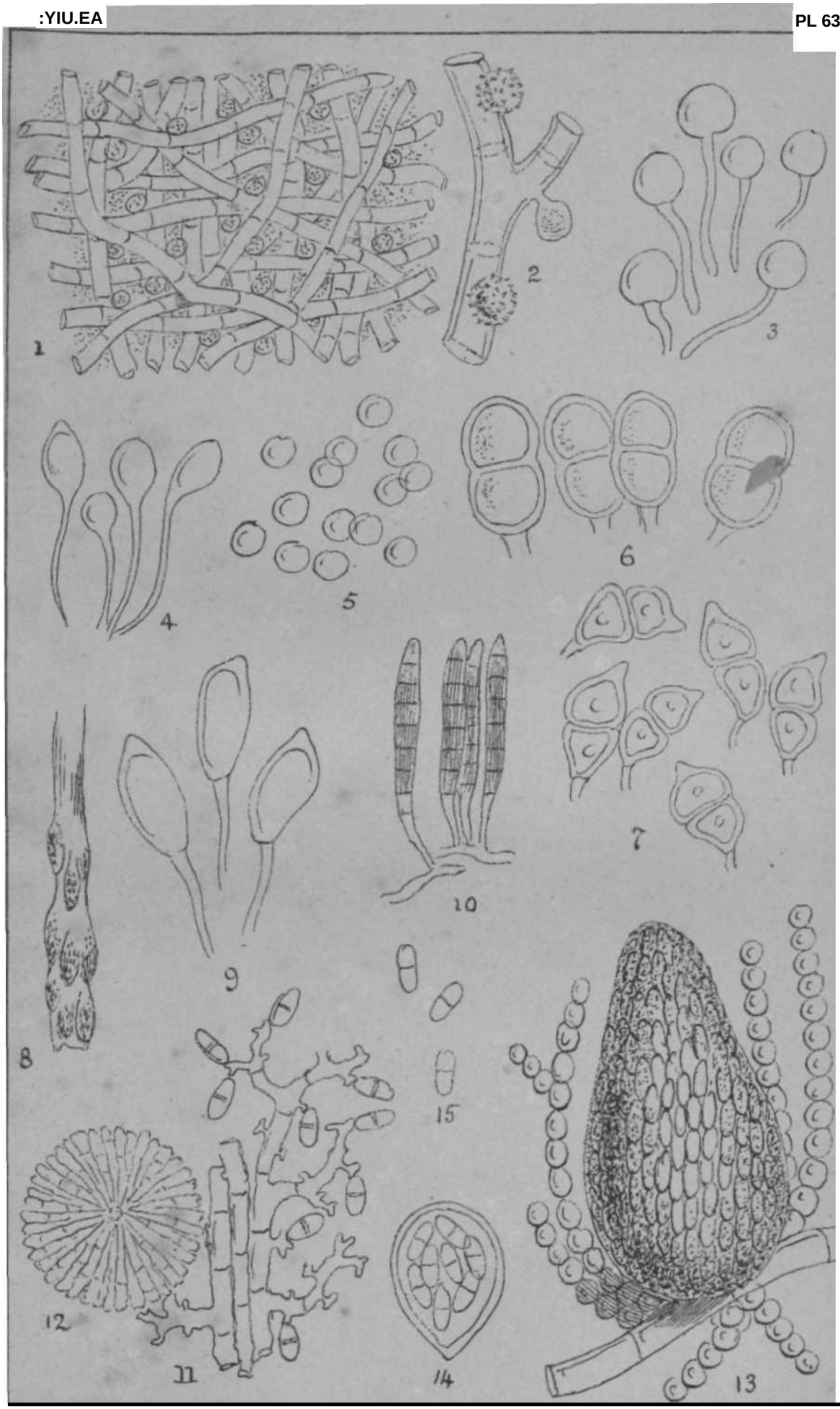
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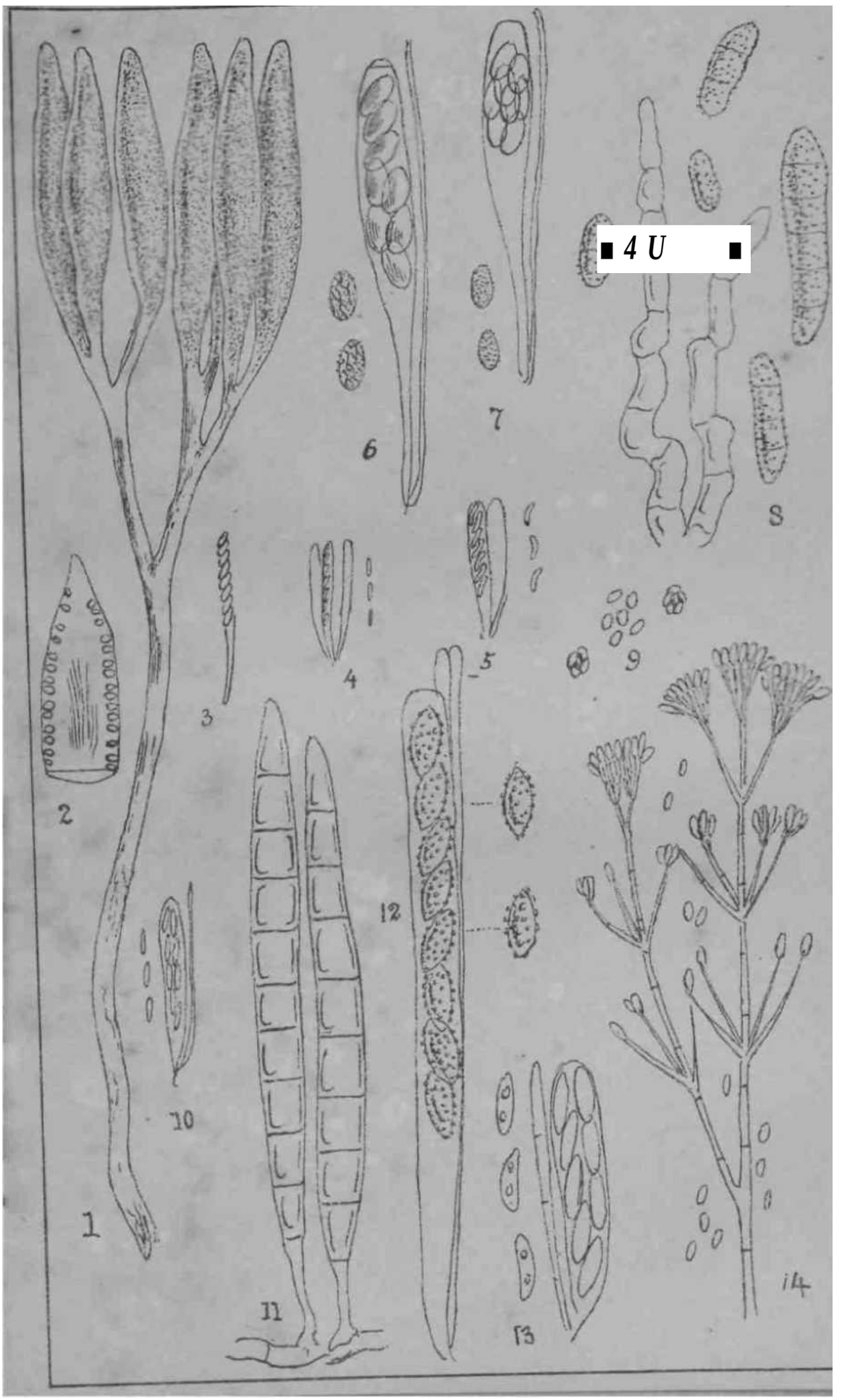

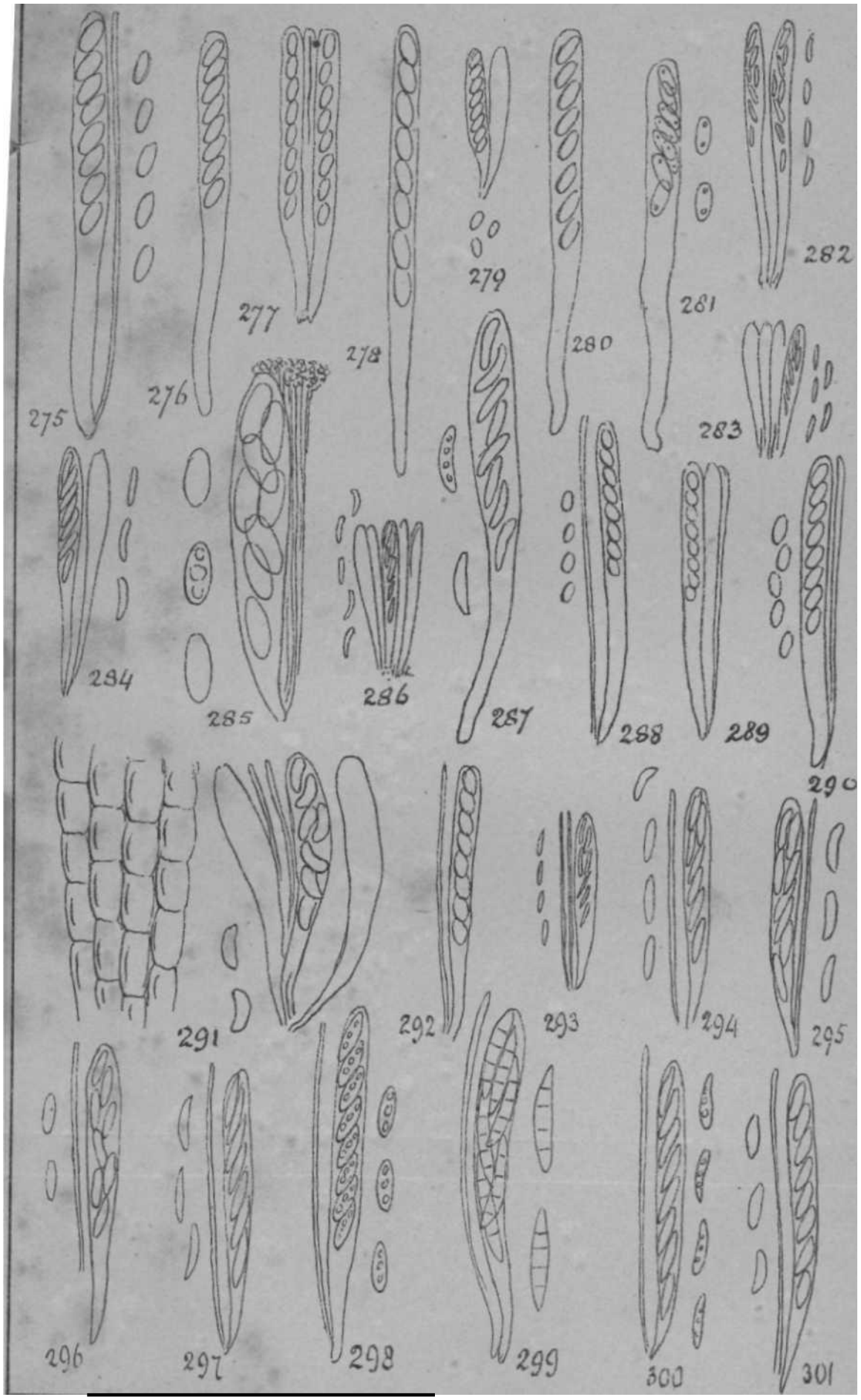
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No. 32.] **[June, 1876.**

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A QUARTERLY RECORD OF CRYPTOGAMIC BOTANY AND ITS LITERATURE.

NOTICES OF NORTH AMERICAN FUNGI. *By the* REV. M. J. BERKELEY, M.A., F.L.S.

***(Concluded, from Vol. III., Page* 108.)**

*** Sphaexia moriformis. *Tode.*—New York, Sartwell. No. 2654.**

903. Sphaeria segregata, *2?. $ C.*—Peritheciis ovatis apice acutis sporidiis angustis elongato-biconicis.

On decayed wood. Car. Sup. No. 884.

Perithecia scattered over the bleached surface, free, orate, acute at the apex ; sporidia hyaline, narrow, uniseptate, elongato-biconical.

904. Sphaeria euoznphala. *B. 8f* C.—Peritheciis cupularibus congestis; ascis clavatis ; sporidiis hyalinis subellipticis.

On fallen branches in damp places. Car. Inf. No. 1550. On ash. Ravenel. No. 1347.

Perithecia cup-shaped, rugose, crowded; asci clavate ; sporidia biseriate, hyaline, subelliptic.

905. Sphaeria subconnata. *B. $ C.*—Peritheciis hemisphaericis dopressis subconnatis ; ascis clavatis farctis ; sporidiis allantoideis.

On *Liquidambar.* Car. Inf. No. 2737,

Scattered over the bark, subconnate, hemispherical, depressed ; asci clavate, stuffed with the minute sausage-shaped sporidia.

906. Sphaeria chiliopyxis. *B. & C.*—Minutissima gregaria nitida globosa; sporidiis hyalinis leviter allantoideis.

On putrid logs. Car. Inf. Ravenel. No. 1705. Extremely minute, gregarious, globose, bright; sporidia hyaline, slightly sausage-shaped.

907. Sphaeiria rhodospila. *B. & C.*—Peritheciis convexis in crustam nigram insidentibus, apice lateritiis; sporidiis oblique fusiformibus triseptatis.

On *Cyrilla.* Car. Inf. No. 5026.

Perithecia convex, seated on a black crust, the apex brick-coloured ; bporidia between cymbseform and fusiform, hyaline, tri-Beptate, -0008 long.

908. Sphaexia txames. ***B. $ C.*****—Peritheciis seriatis globosis subtiliter tomentosis ; ascis clavatis ; sporidiis cynibaeformibus hyalinis.**

On *Acer.* Car. Inf. No. 2787.

Perithecia arranged in lines, three inches or more long, globose, minute, obscurely tomentose ; asci clavate ; sporidia hyaline, cym-bsefonn, resembling those of *Sphceria quercuwn* and its close allies.

*** Sphaexia mammaefoxmis. P.—On oak and beech. Car. Sup. No. 918, 945.**

909. Sphaexia pxinicola. ***B. $ C.*****—Erumpens subglobosa; peritheciis subtiliter granulatis perforatis ; ascis linearibus; sporidiis oblongis fnscis.**

On *Prinus verticellata.* Pennsylvania, Michener. No. 4239.

Perithecia erumpent, rather large, subglobose, very minutely granulated, very obtuse, pierced at the apex ; asci linear ; sporidia uniseriate, oblong, siibcymbiform, *0005 long.

910. Sphaexia obtusissima. ***B. Sf C.*****—Peritheciis ovatis ; ostiolo papillseforini ; ascis linearibus; sporidiis ellipticis obtusissimis fuscis.**

On bleached rotten wood. Pennsylvania, Michener. No. 4198.

Perithecia ovate, with -a papillaeform- orifice half buried amongst the fibres ; asci linear ; sporidia in a single row, brown, elliptic, very obtuse, -0005--00057.

911. Sphaexia disseminata. ***B. $r C.*****—Minuta sparsa ovata semi-imersa; apice attenuata; sporidiis biserialibus breviter fusiformibus triseptatis apud septa constrictis, quandoque verficalitcr divisis.**

On bleached wood of *Liquidambar.* Car. Inf. No. 2149. Car. Sup. On oak posts. No. 837.

Minute, scattered, half immersed, when free ovate, attenuated above; sporidia biseriate, shortly fusiform, triseptate, constricted at the septa, sometimes divided vertically.

912. Sphaexia poxothelia. ***B. Sf C.*****—Peritheciis minutis sparsis in foveolo sitis; sporidiis uniserialibus oblongo-fusiformibus tri-eeptatis.**

On the hymenium of some *Stereum.* Car. Inf. No. 2379^

Perithecia minute, scattered, each seated in a little facette; eporidia uniseriate, shortly ob Ion go-fusiform, rather obtuse at either end, triseptate.

*** Sphaexia obducens.** ***Fr.*****—Mountains of New York.**

On *Sassafras.* No. 4420. On alder. No. 4444.

*** Sphaexia pulvis pyxius. P.—On pear. Car. Inf. Rav. No. 1249. No. 3296, Virginian Mountains, on chesnut, is a small form.**

*** Sphaexia millegxana. *Schwein.*—On *Liriodendron.* Car. Sup. No. 770, 797. Car. Inf. No. 397, 1118, 1878. Ravenel. On *Gossypium*$_y$ oak, and plane. No. 616,1670,1806. Pennsylvania, Michener. No. 6012, 6018.**

Rporidia broadly elliptic, dark, -0006--0005.

*** Sphaezia myziocazpa.** *Ih*\—Car. Snp. On *Acer rubrum.* JL^JO.
397. Mountains of New York. No. 4442. . . \
Sporidia narrow, shortly fusiform, triseptate, *0006-'00057 long.

913. **Sphaezia leucoplaca.** *B. 8f Eav.*—Minuta in stratum album floccosum insidens ; ascis linearibus ; sporidiis ellipticis fujscis.
On cow dung. Car. Inf. No. 1800.
" Minute, black, seated on a broad white floccose spot; asci linear; sporidia uniseriate elliptic.

914. **Sphaezia multifeza.** *B. $ Bdw*—Minuta nigra subglobosa ; ascis brevibus farctis ; sporidiis subglobosis.
On cow dung. Pennsylvania, Michener. No. 3998. Minute, black, subglobose; asci short, oblong, blunt, filled with numerous subglobose, brown sporidia, '00025 long.

* **Sphcexia latericolla.** *DeC*—Car. Inf. No. 3219. Pennsyl
vania, Michener. No. 3824.
Sporidia clavate, hyaline, '0013 long.

915. **Sphaezia zhizophila.** *B.* <$■ *C.*—Sparsa nigra ostiolo brevi lineari; sporidiis fusiformibus curvatis brevibus triseptatis demum fuscis.
On exposed roots. Pennsylvania, Michener. No. 4125.
Scattered, ovate; ostiolum short, transverse, linear; asci clavate ; sporidia shortly fusiform, curved, pointed, '000 G long, triseptate, at length brown.

916. **Sphaezia cyzillicola.** *B. $* C.—Sparsa nigra ovato-conica ; ostiolo papillseformi; asci linearibus; sporidiis lanceolatis leviter curvis 4-septatis.
On *Cyrilla.* Car. Sup. No. 4962.
Scattered, black, ovate, with an acute apex; asci elongated, linear; sporidia lanceolate, slightly curved, quadriseptate, '0008 long.
No. 3598, Pennsylvania, Michener, scarcely differs, except that the sporidia are a little stouter, but of the same length.

* **Sphaezia putaminnm.** *Schtvein.*—On peach stones. Car. Sup.
No. 387. Ohio.
Sporidia about two in an ascus biconical, '002 long, attenuated suddenly at either end.

* **Sphaezia mycophila.** JV.—-On *PolyporL* Car. Inf. **No.** 1071,
2235. Pennsylvania, Michener. No. 4220.
Sporidia elliptici brown uniseriate.

917. **Sphaezia Nysscecola.** *B. % C*—Semiimmersa ; collo elon-
gato ; sporidiis ellipticis, vel brevissime cytnbceformibus.
On *Nyssa*. Pennsylvania, Michener; half immersed, subglobose, with an abrupt at length elongated neck; spores elliptic or shortly cymbseform, *0003 long.

918. **Sphaezia aethiops.** *B% $ C.*—Nigerrima, peritheciis subgloboso ostiolo papillaeform sporidiis biseriatis clavato-oblongis uniseptatis.

Mountains of New York. On old logs. No. 4414, 4455. r Jet black ; perithecia subglobose, with a little nipple, asci cla-[1] vate or oblong; sporidia clavato-oblong, uniseptate, sometimes with a gelatinous coat, #0013 long.

919. **Sphaexia phellogena.** *B. 8f C*—Peritheciis semiimmersis subglobosis. Ostiolo minuto papillseformi ; sporidiis biserialibus enestratis.

On corky bark of oak. No. 5895.

Half immersed, subglobose, with an obscure papillaefortn ostio-lum; sporidia biseriate, shortly fusiform, fenestrate, *0013 long, nearly hyaline.

* **Sphaexia papilla.** *Schwein.*—On bark which had been covered with earth. Car. Sup No. 268.

Sporidia shortly fusiform, oblique, uniseptate, '0013 long.

* **Sphaexia mastoidea.** i^V.—On ash. Car. Sup.

Sporidia shortly fusiform, triseptate, -0006--0005 long.

* **Sphaexia pexicaxpii.** *Schrvein.*—On *Gary a.* Car. Inf, No. 3702.

* **Sphaexia caxyophaga.** *Schrvein.*—On *Carya.* Car. Inf. No. 6032.

* **Sphaexia dxupivoxa.** *Schwein.*—Pennsylvania, Michener. No. 3957. On hickory nuts.

* **Sphaexia asseda.** *Bchweiii.*—Car. Inf. No. 4949. On *Cyrilla.*

Asci scarcely -002 long ; sporidia sausage-shaped, *0 0025 long.

920. **Sphaexia micxoloncha.** *B, $ C.* — Sparsa ovata echinata ostiolo brevi ; ascis clavatis ; sporidiis ellipticis 4-septatis, subdi-yisis.

On the inside of bark of *Liriodendron.* Car. Inf. No. 2459.

Scattered, superficial, ovate, with a sbort neck, sprinkled with short setaB; asci clavate; sporidia biseriate, with about four horizontal septa, and a few oblique or vertical.

921. **Sphaexia fissuxaxum.** *B. $ C.*—Peritheciis par vis globosis breviter villosis, collo crassiusculo sursum attenuato ; ascis parvis, sporidiis minutis oblongis.

On pine rails. Car. Inf. No. 3708.

Perithecia globose, covered with short villosity ; ostiolum rather thick, attenuated upwards ; asci lanceolate, short, sporidia minute, oblong, hyaline.

* **Sphaexia apiospoxa.** *Mont.*—On *Arundinaria.* Car. Inf. No. 2742. Alabama, Peters. No. 6076. Sporidia -001 long.

922. **Sphaexia oxthogxammi.** B. ^ *C.*—Uneata epidermide, ni-
grefacta ticta, sporidiis oblongo-fusiformibus triseptatis.

On *Tea.* Pennsylvania, Michener. No. 5151. On *JErianthus alopecuroides.* Car. Inf. No. 3748, 4979, 4999.

Forming parallel black lines surrounded on each side by the

cuticle ; asci clavate ; sporidia oblongo-fusiform, triseptate, the two middle articulations shorter than the two terminal ones. No. 3748, 4999. Car. Inf. On *Erianthus alopecurvides* appears to be the same, but it is without fruit.

923. **Sphaeria eumorpha.** *B. Sf* C—Linearis chidermide arete
cincta, rima angusta aperta; ascis linearibus, sporidiis oblongis
uniseptatis.

On *Arundinaria*. Car. Inf. No. 5014. Linear, closely surrounded by the cuticle, opening with a narrow slit; asci linear ; eporidia uniseiiate, shortly oblong or subcymbiform, '0005 long, nnisoptate. A broader and stronger species than the last. There is another distinct species on *Arundinaria* from Alabama, but indes-eribable, without sporidia.

* **Sphaeria arundinacea.** *Sow*.—On *Arundinaria.* Car. Inf.
No. 493.

Sporidia biseriate, obliquely fusiform, 5-septata, #001 long.

• **Sphaeria Zeae.** *Schrvein.*—On *Zea.* Car. Sup. No. 372.

Sporidia oblong or narrower below, uniseptate, '001 long.

924. **Sphaeria Zizaniaecola.** *B. $ C.*—On onenino sepulta leviter turn ens ; ascis ellipticis-, sporidiis linearibus rectis vel sigmoideis, 5-6-septatis. *S. ?'imosa,* Schwein. Herb.

On *Zizania,* forming little swollen patches, slightly discolouring the cuticle ; asci elliptic, containing four linear straight or sigmoid 5-6 septatetsporidia, -0013-005 long.

925. **Sphaeria Beaumontii.** *B. $ C.*—Lirreario brevis erumpens, axis elongatis clavatis, sporidiis biserialibus linearibus multiseptatis.

On stalks of some grass. Alabama, Beaumont. No. 5112.

Forming little short black lines, bursting through the cuticle; asci elongated, clavate; sporidia linear, sometimes oblique, with about nine septa, and a nucleus in each joint, '002 long.

926. **Sphaeria Pteridicoli.** *B.* <$• *C.j*— Linearis subcuticularis ascis clavatis, sporidiis oblongis curvulis uniseptatis.

On stalks of *Pteris,* forming little grey parallel lines, covered with the cuticle ; asci clavato; sporidia oblong, slightly curved, obtuse at either end, uniseptate, -0006 long.

927. **Sphaeria juncina.** *B. &* i?.—Irregularis ostiolis punctata,
pporidiis oblongis uniseptatis, medio subconstrictis.

On *Juncus.* Car. Inf. Raven el. No. 1217.

Forming little discoloured patches, which are studded with the ostiola ; sporidia oblong, uniseptate, constricted slightly at the septum. Very different from *S. J'unco,* with its elliptic binucleate sporidia, -0003--0004 long.

* **Sphaeria Junci.** *Fr.*—Car. Inf. No. 3061. *S. longi&sima,* **Fr. On**

Archemora ternata. **Car. Sup. No. 957, and** ***S. nebulosa,*** P. On *Ambrosia tripida*. Car. Sup. No. 788, are apparently ***Phomata.***

* **Sphaeria pilifera.** *Fr.*—On pine rails. Car. Inf. No. 2317.
On oak. Alabama, Peters. No. 5232. Pennsylvania, Michener.
No. 4075. Sporidia sausage-shaped, -0002 long.

* **Sphaeria rostrate.** *Fr.*—On *Acer.* Car. Inf. No. 2490.

928. **Sphaeria sepelibilis.** *B. $ C*—Hysteriiformis cuticula nigre-
facta tecta ; sporidiis ellipticis, 1-2 nucleatis.

On *Smilax'laurifolia.* Car. Inf. No. 4877.

Hysteriiform, covered by the blackened cuticle ; sporidia elliptic, with one or sometimes two nuclei, -0005 long.

928* **Sphaeria inordinata.** *B. Sf C.*—Epidermide tecta prominens ; ascis clavatis sporidiis allantoideis.

On *Rosa laevigata.* Car. Inf. No. 2501.

Covered by the cuticle, which is raised by the subjacent peri-thecia into little prominences, which make the whole surface like a raspte ; asci clavate; sporidia sausage-shaped.

929. **Sphaeria brachytheca.** *B.* <£• *C.*—Peritheciis minutis cuti
cula circumdatis; a^cis obovatis brevibus; sporidiis clavatis, 6-septatis.

On *Rosa.* New England, Russell. No. 5874.

Perithecia minute, surrounded by the cuticle; asci obovate, very short, sporidia clavate, with about 6 septa, '001 long, resembling **those of *Patellnria atrata.***

* **Sphaeria scoriadea.** *Fr.*—On bark of *Be tula lent a.* Penn
sylvania, Michener. No. 4091. Arctic America, Drummond.

930. **Sphaeria celtidis.** *B. $ C*—Gregaria minuta, ostiolo prominulo ; ascis brevibus ; sporidiis oblongis uniseptatis.

On branches of *Celtis.* Car. Inf. (Ravenel, No. 1422).

Perithecia closely packed, but distinct, covered by the bark which is slightly raised, so that the whole looks like fine shagreen ; ostiola rather prominent, asci short, with four sporidia which are oblong, obtuse, uniseptate. Allied to the last.

* **Sphaeria livida.** *Fr.*—On bleached wood. Texas, C. Wright.
No. 3781, 3902. Mountains of New York. No. 4469.

Sporidia oblong, elliptic, 5-septat'e, fenestrate, '001 long.

931. **Sphaeria Polynesia.** *B. $* 6*.—Oblong a peritheciis conditis ; ascis filiformibus, sporidiis fuscis oblongis.

Mountains of Virginia. No. 3347.

Forming little oblong black spots, which are studded with the ostiola ; asci very slender ; sporidia oblong, brown, -00028 long.

* **Sphaeria spiculosa.** P.—Car. Sup. No. 33.351. Car. Inf.
No. 1406.

932. **Sphaeria semiimmersa.** *B. % C.*—Deorsum immersa, sursum
subcylindrica, sporidiis oblongis, curvis quadrinucleatis.
On dead herbaceous stems. Connecticut, C. Wright. No. 5628.
Perithecia immersed below, above sub cylindrical or subconical; sporidia linear, oblong curved, "0006 long.

933. **Sphaeria dosterium.** *B. $* ft—Minnta erumpens ; sporidiis inedio ellipticis utrinque appendice longa curvata.

On *Spiraea opulifolia.* Mountains of New York. No. 4428.

Bursting through the cuticle, which at first is closed and is black and shining; asci lanceolate ; sporidia elliptic in the centre, with a long attenuated curved appendage at either end, "002 long. Sometimes the elliptic part is divided into two elliptic joints. A very curious species.

934. **Sphaeria Murrayi.** *B. &* C—Pcrithcciis epidermide tectjs
prominulis ; ascis lanceolatis ; sporidiis oblongis centro constrictis quadrinucleatis.

On apple. New England, Murray. No. 5706.

Perithecia covered by the cuticle, rather prominent; asci lanceolate ; sporidia oblong, constricted in the middle with four nuclei, probably septate when older; each perithecium is surrounded externally with short white hairs, but it is uncertain whetner they belong to the plant.

* **Sphaeria salicella.** *Fr.*—Pennsylvania, Michener. No. 3487.

***Sphaeria palmaxum.** *Mont.*—On *Sabal.* Alabama, Beaumont.
No 4645.

935. **Sphaeria sabaligera.** *B. Sf C.*—Sparsa minuta epidermide
nigrefacta tecta, ascis clavatis, sporidiis biseriatis.

On *Sabal,* with the former.

Scattered, minute, covered by the blackened cuticle; sporidia biseriate; sporidia fusiform, curved, triseptate, *001 long. No. 4889 on *Sabal,* is unfortunately without fruit.

* **Sphaeria yuccae.** *Schwein.*—On *Yucca aloifolia.* San tee TJiver.
No. 1588.

I find asci, but at present no certain sporidia.

936. **Sphaeria combulliens.** *B. 8f C.*—Peritheciis ostiolo minuto
excepto abditis ; sporidiis oblongis uniseriatis uniseptatis.

On stems of *Arundinarta,* accompanied by some other seriate species; scattered, covered by the cuticle, with the exception of the minute ostiolum ; sporidia uniseriate oblong, uniseptate.

* **Sphaeria pruinosa.** *Fr.*—On *Fraxinus sambucifolia.* Penn
sylvania, Dr. Michener. No. 8574. Car. Sup. No. 787.

Sporidia sausage-shaped.

937. **Sphaeria semitecta.** *B. $ C*—Peritheciis semitectis; spori diis clavatis, triseptatis.

On Plane. Virginian Mountains. No. 3340.

Perithecia raised, half covered by the cuticle, which forms a little ring to each perithecium, sporidia clavate, triseptate, slightly

constricted at each septum, -0013 long, clothed at first with a thick gelatinous coat.

938. **Sphaeria citrispora.** *B. $ C.*—Omidno tecta ; a^cis clavatis,
sporidiis hyalinis citriformibus.

On *Tilia glabra,* Virginian Mountains. No. 3356.

Quite covered by the cuticle, asci clavate; sporidia biseriate, either lemon-shaped or narrower, "0013 long.

* **Sphaexia velata.** P.—Pennsylvania, Michener. No. 4052.

939. **Sphaexia Eunotia.** *B. % C*—Peritheciis emmpentibus; ascis clavatis ; sporidiis oblongis utrinque medio tumidis hyalinis.

On stems of Ivy. Carolina. No. 6382.

Bursting through the cuticle; asci clavate, sporidia oblong, hyaline, swelling in the middle on either side like the frustules of *Eunotia,* -001--0008 long.

940. **Sphaeria cupxessi.** *B. & C.*—Peritheciis epidermide tectis
prominulis applanatis, ascis clavatis, sporidiis hyalmis clavatis vel breviter fusiformibus.

On *Cupressus tlwjoides.* Car. Inf. No. 3287. Perithecia covered by the cuticle, but prominent, with a distinct ostiolum ; asci clavate ; sporidia hyaline, clavate or shortly fusiform.

941. **Sphaexia gxiseo-tingens.** *B. 8f* C—Minuta sublineari- prominula, ascis clavatis, sporidiis fusiformibus hyalinis.

On *Juniperus virginiana.* Pennsylvania, Michener. No. 6029.

Gregarious, forming little detached or continuous short linear prominences, marked with the ostiola; asci clavate; sporidia obliquely fusiform, 0008 long.

942. **Sphaexia olivaespoxa.** *B. & C.*—Peritheciis epidermide tectis prominulis: ascis linearibus, sporidiis oblongis, utrinqne subito
angustatis triseptatis.

On *Cornus florida.* Car. Inf. No. 2078.

Perithecia covered by the cuticle, but rather prominent, marked in the centre with the black'ostiola ; asci linear, sporidia oblong, pointed at either extremity with three septa about four times longer than broad.

* **Sphaexia nigxo-annulata.** *B. # C.*- Journ. Linn. Soc, x. p. 388.

On *Yucca aloifolia.* Car. Sup. No. 4915. Cuba.

943. **Sphaexia eliminata.** *B. <$•* O.—Peritheciis epidermide nigre-
facta tectis; ostiolo albo ; ascis linearibus; sporidiis anguste ob longis uninucleatis.

On *Smilax.* Alabama, Peters. No. 4570.

Perithecia covered by the jet black cuticle, which is the more conspicuous from the unoccupied parts" being white, marked in the centre with white above the ostiolum ; asci linear; sporidia unise-riate, oblong, '00057 long, from four to five times longer than broad.

* **Sphasxia lonicexae.** *Sow.*—Car. Sup. **No.** 813.

*** Sphaexia sepincola.** *Fr.*—On *Spircea opulifolia.* Mountains
of New York. No. 443.

Sporidia fusiform, triseptate, *0004 long.

On *Lonicem.* Car. Inf. No. 1269.

» **Sphaexia syxingae.** -F?\—Car. Inf. No. 3756. On *Syringa* ***vulgar is.***

Asci linear; sporidia uniseriate; sporitlia oblong, "0002 long. The original specimens from Schweinitz and Fries are stylosporous.

944. **Sphaeria stictoides.** *B. $ C.*—Peritheciis applanatis depressis epidermide cinctis; sporidiis 5-septatis; apud medium septum constnctis subbiconicis.

On *Liriodendron.* Car. Suj3. No. 72.

Forming little irregular depressed spicules surrounded by the cuticle; sporidia nearly biconical, one division larger than the other, 5-septate, constricted at the middle septum.

* **Sphaeria subsimplex.** *8c7twein.—QwRhus glabra.* Mountains
of New York. .No. 4425.

Sporidia elliptic, hyaline, *00057 long.

945. **Sphaeria polysticta.** *B.* <fc *C.* — Ostiolo excepto cuticula
tecta; ascis linearibus ; sporidiis oblo^gis uniseptatis fuscis.

On *Smilax.* Beaumont. No. 4874*

Perithecia scarcely raising the cuticle, visible chiefly from the black dotlike ostiola ; asci linear; sporidia oblong, uniseptate, •0003 long, rather more than twice as long as broad.

946. **Sphaeria disrupta.** *B. 4 C.*—Peritheciis cuticula tectis* tumentibus, ostiolo punctiformi ; ascis obovatis; sporidiis biseriatis ellipticis hyalinis.

' *On Smilax.* 'Car. Inf. No. 2141.

Perithecia causing little swellings in the unaltered cuticle, which are pierced in the centre by the ostiola; asci broad, obovate, with two rows of hyaline elliptic sporidia, accompanied by brown elliptic binucleate stylospores in different perithecia.

* **Sph&ria cucurbitacearum.** *Schrvein.*—On gourds. Car. Sup.
No. 276. Car. Inf. No. 1731, 1733.

Sporidia oblong, -0003 long. I have not, however, seen asci.

* **Sphaeria Xlicis.** *SciileicK*— On leaves of *Ilex opaca.* Car. Inf.
No. 1084.

Sporidia biseriate, swollen on either side like the frustules of ***Eunotia.***

947. **Sphaeria hypercina.** *B. X C.*—Stictoidea epidermide cincta ; ascis clavatis; sporidiis cymbaeformibus hyalinis.

On *Hyperica.* Car. Inf. No. 3701.

Perithecia depressed, surrounded by the cuticle; asci clavate; sporidia cymbseform, hyaline, "001 long. Looking somewhat like *S. stictoides,* but with very different fruit.

* **Sphaeria Kalmiarum.** ***8ch?vein.*—On *Rhododendron arboreum***
and *Kulmia latifolia.* Car. Sup. No. 420, 421.

* **Sphaeria epidermidis.** *FT.*—On *Sambucus.* Car. Sup. No.

923.

* **Sphaeria acuta.** *Movg.*— Car. Sup. No. 17, 331, 356. Car. Inf. No. 6046. Virginian Mountains. No. 3315.

* **Sphaeria acuminata. &w.—Car.** Inf. No. 1888. Virginian Mountains. No. 3360. Pennsylvania, Michener. No. 4311. Alabama, Peters. No. 5237. No. 563*i.*, Connecticut, wnght, is probably a young state, before one of the joints becomes swollen ; sent out as *S. vibriospora*, B. & C.

* **Sphaeria complanata.** *Tode.*—Virginian Mountains. No. 3300.

* **Sphaeria herb arum.** *Fr.*—Car. Inf. No. 2518, 3710, 6174. Virginian Mountains. No. 3310. Alabama, Beaumont. No. 5080.

* **Sphceria Ogilviensis.** *B. 8f* JBr.—On *Cimicifuga racemosa.* Virginian Mountains. No. 3293.

Sporidia biconical, 5-septate, constricted at the middle septum, •0015 long.

No. 3304, on *Eupatorium purpureum,* seems the same thing in a younger state, as also No. 3304.

* **Sphaeria Doliolum.—**Car. Sup. **No.** 758, 896, 29.

* **Sphaexia rubella.** *Fr.*—Car. Inf. No. 3232. Sporidia very long, filiform.

* **Sphaeria phomatospora.** *B.* " Cooke Handbook," p. 884—On *Andropogon.* Car. Inf. No. 4944, 4985.

Sporidia oblong, elliptic, -0004, binucleate.

* **Sphaeria Dematium.** P.—Car. Inf. On *Phlox pnniculata.* Car. Inf. No. 1759. On *Allium Cepa.* Car. Sup. No. 460.

More properly *Vermicularia Dematium.*

* **Sphaeria Verbascicola.** *Schivein.*—Car. Inf. Ravenel.

* **Sphaeria Brassicae.** *Schwein.*—New England, Murray. No. 5370.

* **Sphaeria tenebrosa.** *B.* <fc *Br.* " Cooke Handbook," p. 898.—On *Vernonianovcebovacensis.* Pennsylvania, Michener. No. 4132.

* **Sphaeria culmifraga.** *Fr.*—On *Panicum.* New England, Sprague. No. 5810. Scarcely mature.

* **Sphaeria phaeocomes.** *Reb.*—Car. Inf. No. 1413.

948. **Sphaeria olericola.** *B.* <£• C.—Congregata ; peritheciis conicis ; sporidiis oblongis curvulis 3-septatis.

On stems of *Brassica.* New England, Murray. No. 5426.

Perithecia gregarious, conical; sporidia oblong, slightly curved, triseptate, *001 long. A curious diseased state occurs in which the sporidia turn black and lose all trace of septa.

949. **Sphaeria ceratispora.** *B. fy C.*—Congregata conica ; spo
ridiis elongatis utrinque acuminatis pluriseptatis apud septa prominulis.

On some thick herbaceous stem, possibly *Zea.* Car. Inf. No.
2217.

Perithecia gregarious, conical; sporidia long, curved, acuminate

at both ends, with 12 or more septa, projecting at the septa like the horns of some antelopes.

950. Sphaexia incommiscibilis. ***B. 8f C*****—Minuta epidermide tecta ; ostiolis papillaeformibus ; ascis linearibus; sporidiis fusiformibus angustis demum uniseptatis.**

On stalks of some herbaceous plant. Virginian Mountains. No. 3313.

Minute, covered with the cuticle; ostiola projecting, papillae-form; asci linear; sporidia shortly fusiform, acuminate «t either end, at length uniseptate, #0008 long.

951. Sphaexia stictostoma. ***B. % C.*****—Peritheciis epidermide tectis tumidulis demum liberatis subconicis ; ascis oblongis; sporidiis biseriatis cymbasformibus 5-septatis apud septa constrictis.**

On some herbaceous plant. Connecticut, C. Wright. No. 4655.

Perithecia covered by the .cuticle forming little corresponding prominences pierced by the ostiola, at length free, subconical; asci oblong ; sporidia biseriate, cymbaeform, 5-septate, constricted at the commissures, *0008 long. No. 916, on inflorescence of *Plantago*7 scarcely differs.

952. Sphaexia oenothexae. ***B. $ G.*****—Minutissima ; ostiolo puncti-formi prominnlo; ascis clavatis ; sporidiis hyalinis breviter fusi-formibus obtusis.**

On *CEnotherce sinnata.* Car. Inf. No. 2243. Very minute, black ; ostiola rather prominent; asci clavate; sporidia shortly fusiform, obtuse at either end, hyaline.

953. Sphaexia phlyctanoides. ***B. fy C,*****—Irregularis fusca deplanata; ascis late lanceolatis brevibus ; sporidiis biseriatis cymbae-forinibus endochromate utrinque retracto.**

On stems of *Dolichos.* Alabama, Beaumont. No. 4858.

Forming little brown irregular specks on a white ground; asci short, broadly lanceolate ; sporidia cymbaeform, with the endo-chrome retracted at either end, #0005-'00057 long.

*** Sphaexia Berkeleii.** ***Desm.*****—On *Phytolacca.***

954. Sphaexia sepnlta. ***B. 8f C.*****—!Peritheciis sepultis ostiolo enier-gente; sporidiis allantoideis.**

On *Smilax.* Car. Inf. No. 1882. >

Perithecia buried as in *Sphceria Berkeleii;* sporidia minute sausage-shaped.

955. Sphaexia mesoedema. ***B. fy C.*****—Peritheciis demum denu-datis conicis; sporidiis utrinque acuminatis, 8-septatis**

articulo
medio tumido colorato.

On *Eupatorium coronopifolium*. Car. Inf. No. 3727. On *Cirsium muticum.* Ravenel. No. 640.

Perithecia at length liberated, conical; sporidia elongated, acuminate at either end with about 8-septa, the central joint swelling, •0025 long.

056. Sphaeria Lophanthi. 2?. *$ C*—Miimta epidermide tecta; ascis oblongis ; s|joridiis fusiformibus, 6-septatis.

On *Lophanthus,* Pennsylvania, Michener. No. 4013.

Perithecia minute, covered by the cuticle ; asci oblong ; spondia fusiform, slightly curved, 6-septate, '002 long.

957. Sphaeria glomus. *B. $ C.*— Convexa medio perforata; sporidiis linearibus sigmoideis; stylosporis obovatis prirnum per paria connatis.

On *Amhrosih.* Alabama, Beaumont. No. 4612.

Perithecia convex, perforated ; sporidia linear, sigmoid, -001-"002 long. Stylospores are produced within flat dark specks, seated on forked threads, and at first joined in pairs so as to make an obovate mass, then separating and still obovate, but narrow, •001 long.

958. Sphaeria Dioscoreae. *B. & C*—Minutissima ; ascisbrevibus ; sporidiis oblongis uniseptatis paucis.

On stems of *Dioscorea.* Car. Inf. No. 5041. Very minute ; asci short, with few sporidia, which are oblong and uniseptate, about three times longer than broad, '0008 long.

959. Sphaeria lathyrina. *B. #•* a—Minutissima ; ascis oblongis ; sporidiis octonis oblongis uniseptatis, apud septum constrictis.^

On *Lathy}-us latifolia.* Pennsylvania, Michener. No. 4247. _ Very minute; asci oblong; sjoridia biseriate, oblong, uni-Beptate, constricted at the septum, '0003 long.

960. Sphaeria incarcerata. *B.* <fr C—Abdita, rima longitudinali aperta; sporidiis torulosis 5-septatis.

On stems qf *Spartina.* Car. Inf. No. 6176.

Perithecia under a little clouded speck of the cuticle opening by a little longitudinal fissure ; sporidia torulose, straight, with 5 septa, '002 long.

961. Sphaeria sarcocystis. *B. %* C—Brevis convexa; peri- theciis parietibus carnosis conjunctis ; ascis oblongo-tumidis ; sporidiis quarternis triseptatis, articulis demum longitudinaliter divisis.

On wheat. Carolina. No. 6358.

Forming little oblong prominent black bodies, which consist of a few closely joined perithecia with fleshy walls ; asci rather short, oblong, but tumid, containing four oblong obtuse sometimes clavate sporidia, with three horizontal articulations and a few vertical, •002 long. Perhaps more properly placed in *Dothidea.*

9G2. Sphaeria ulxnaticolor. B. *fy C.*—Maculis effusis umbrinis ;

ascis linearibus; sporidiis ellipticis fuscis.

On decorticated smooth branches. Car. Inf. No. 4982.

Effused, continuous, umber-brown ; perithecia minute ; asq linear; spondia uniseriate, elliptic, brown, *0003-*00314.

963. Sphaeria umbrinella. *B. 8f C.*—Peritheciis umbrinis, ostiolo papillaeformi nigro ; ascis linearibus ; sporidiis ellipticis fuscis.

On *Eupatorium coronopifolium.* Car. Inf. No. 4959.
Perithecia umber, with a black papillaeform ostiolum; asci linear; sporidia uniseriate, brown, elliptic, bhmcleate.

* Sphaexia dendroides. *Schrvein.*—Car. Sup. No. 690. On
leaves of *Quercus alba.*

* Sphaexia myxiadea. *B.C.*—On leaves of *Uvaria trploba.*
Ohio. No. 162. On oak leaves. Car. Sup. No. 39.

* Sphaexia maculaefoxmis. *P.*—On beech leaves and *Fraxinus*
Epipterus. Car. Sup. No. 95. Car. Inf. On various leaves,
3225, 3736, 3836. Texas, Lindheimer. No. 3642.

* Sphaexia punctifoxmis. P.—On *Quercus aquatica, obtusiloba,*
Carya, Lyonia ligustrina. Car. Sup. No. 91. jCar. Inf. *Cornus*
fiorida. No. 689, 3695. Ravenel. No. 1616, 1603, 813.

* Sphaexia oxbicula. *Scliwein.*—On *Quercus tinctoria.* Car. Sup.
No. 677.

964. Sphaexia leucospila. *B. Sf C.*—Peritheciis in maculas nervis parallelas; ascis Hnearibus ; sp'oridiis filiformibus.

On leaves of *Platanus.* Car. Inf. No. 1957.

()n narrow pallid spots parallel with the nerves on the under side of the leaves; asci linear ; sporidia filiform.

9G5. Sphaexia caxectoxum. *B. fy_ C.*—Minuta punctiformis sparsa prominula ; ascis clavatis ; sporidiis breviter fusiformibus quadri-nucleatis.

On leaves of *Carex folliculata.* Car. Inf. No. 2153.

Minute, dotlike, scattered, rather prominent; asci clavate; sporidia shortly fusiform, quadrinucleate.

966. Sphaexia inter cellular is. *B. Sf* C,—Peritheciis in cellulis di-
latatis, basi radiatis ; ascis brevibus sursum angustioribus; sporidiis breviter cymbiformibus uniseptatis.

On *Typha.* Massachusetts, Russell. No. 5438.

Perithecia contained in the larger or dilated cells, about -002 in. diameter, with a few radiating threads ; asci short, thicker at the base ; sporidia shortly cymbseform, uniseptate, *0005 long.

967. Sphaexia appendiculosa. *B. Sf C*—Perithecia hie illic congestis, basi epidermide arete cinctis; ascis oblongis; sporidiis
biseriatis fusiformibus utrinque appendiculatis.

On leaves of *Sapinda.* Texas, C. Wright. No. 3887.

Perithecia collected two or three together, closely surrounded at the base by the cuticle ; asci oblong; sporidia biseriate, fusiform,

quadrinucleate, with a filiform straight hyaline appendage at either end, #0005 long without the appendages.

*** Sphaexia Andromedae.** ***Schweui.*****—On leaves of** ***Andromeda nitida.*** **Car. Sup. No. 718.**

*** Sphaexia Sarraceniae.** ***Scfwuein,*****—On** ***J$a?Tacenia rubra.*** **Car. Inf. No. 1192. On** ***S. flava.*** **No. 1216.**

Asci very short, obovate ; sporidia oblong, uniseptate, '0004 long.

* **Sphaeria Solidaginum.** *Sciiwein.*—On *Solidago Canadensis.*
Car. Sup. No. 582, 601.

* **Sphaeria 'Fotentillae.** *Schroein.*—Cotoosa Springs, Georgia (Ravenel. No. 1723).

* **Sphaeria petiolorum.** *Schweiti.*—On petioles of *Liquidambar.* Car. Inf. No. 1120.

Clearly the same as *S. amcpna,* Nees.

968. **Sphaeria Janus.** B. # C.—Peritheciis in maculas orbiculares congestis, folia ad superficiem alteram penetrantibus ; ascis brevibus oblongis ; sporidiis breviter fusiformibus angustis 4-septatis.

On leaves of *Quercus virens.* Texas, C. Wright. No. 3908.

Perithecia collected in orbicular spots on the under side of the leaf, and penetrating to the upper surface; asci short, oblong; sporidia narrow, shortly fusiform, with 4-septa.

9G9. **Sphaeria Nebraska.** *B. # C.*—Minuta ; subhysteriiformis, ascis oblongis, sporidiis ellipticis nniseptatis.

On leaves of grass. Nebraska, Hayden. No. 6405.

Minute, shortly hysteriform; asci oblong, slightly swollen; sporidia in two rows, elliptic, uniseptate, '00057 long, hyaline.

970. **Sphaeria Wrightii.** *B.* <fc *C.*—Subcnticularis cupulari-col-
lapsa; ascis lanceolatis, sporidiis biseriatis oblongis curvulis.

On leaves of *Statice limoniwh.* California, C, Wright. No. 5456.

Covered with the cuticle collapsing, and then cup-shaped ; asci lanceolate obtuse; sporidia biseriate ; sporidia oblong, slightly curved, *001-*0013 long hyaline, with a narrow gelatinous border.

*** Sphaeria plantaginicola.** *Schivcin.*—On *Plantago lanceolata.*
Pennsylvania.

***Sphaeria ulmea.** *Schmein.*—Michener. No. 4107. Car. Sup. On *Ulmus americana.* No. 571, 2213. Car. Inf. Montreal, Dr. Maclagan. No. 548. Canada, Poe. No. 6142.

* **Sphaeria coryli.** *Batsch.*—Carolina, Buckley.

* **Sphaeria fimbriata.** P.—On Hornbeam. Rhode Island, Olney. No. 1840

* **Sphaeria fraxinicola**—*Schwein.*—Car. Inf. No. 4939.

* **Sphaeria convexula.** *ScUwein**— On leaves of *Carya.* Car.
Inf. Ravenel. No. 813.

971. **Sphaeria philoprina.** *B. $ C.*—Peritheciis nitidis centro e

cuticula albis ; ascis oblongis ; sporidiis biseriatis cymbajformibus
hyalinis.

On leaves of *Ilex*. Car. Sup. No. 327.

Perithecia shining black, white in the centre from the cuticle ; asci oblong, short; sporidia biseriate,. hyaline, cymbaeform.

972. **Sphaeria nigzotecta.** *B. $ Rav.* — Perithcciis nitidis centro e cuticula albis ; ascis lincaribus, sporidiis ellipticis fuscis.
On leaves of *Ilex.* Car. Inf. (Eavenel, No. 1243.) Externally like the last but smaller, asci linear, sporidia in **a** single row, brown, elliptic.

973. **Sphseria Lycopodii.** *B, <b C.*—Punctiforinis epidcrmide condita; ascis clavatis, sporidiis biseriatibus, breviter fusiformibus biseptatis.

On *Lycopodium.* New Jersey. No. 4686.

Punctiform, quite covered by the cuticle, not the least projecting ; asci clavate; sporidia biseriate, shortly fusiform, hyaline, biseptate.

* **Depazea cruenta.** *Kze.*—On *Smilacina.* Rhode Island. Car.
Inf. No. 1744a.

* **Depazea kalmicola.** *Schrvein.*—Car. Inf. Car. Sup. No. 89.

974. **Depazea bxunnea.** *B. 4- C.*—Maculis orbicularibus brunneis; ascis clavatis; sporidiis angustis fusiformibus quad rinucleatis.

On leaves of *Acer rub rum.* Car. Inf. No. 2260.

Spots dark brown, orbicular, about ^ inch across ; asci clavato, sporidia biseriate, narrow, fusiform, sometimes slightly curved, with four nuclei.

975. **Depazea concentrica.** *B.* <fc *C.*—Maculis annul is concen
tric is albis brunneisque variegata, peritheciis in annulispallidis sitis.

On leaves of *Asarum virginicum.* Alabama. No. 3987.

Spots more than an inch in diameter, orbicular, consisting of about seven alternate white and brown rings; perithecia numerous, situated on the fallen rings. Unfortunately I could not find perfect fruit.

* **Depazea smilacicola.** *Schroein.*—Car. Sup. No. 253. Car.
Inf. No. 1514.

976. **Massaria seiridia.** *B. % C.*—Peritheciis paucis, in pustulis parvis conditis; ascis tetrasporis; sporidiis oblongis utrinque obtusis triseptatis; endochromatibus connexis.

On *Robinia.* New England, Russell. No. 5871. Sartwell. No. 3073. On Peach. New York, Sartwell. No. 2620. Mountains of Virginia, on *Robinia.* No. 3353. Car. Inf. On *Acer,* 1789, 2783.

Perithecia few, hidden by the bark; disc small, pulverulent; asci containing four sporidia, which in the three first numbers are oblong, obtuse at either end, in the three latter more spindle-shaped, in all about '005 long, triseptate, with the endochromes united by a little cylindrical process. *Sphceria ocellata,* Schwein. Herb.

977. **Massaria vomitoria.** *B. Sf* C.—Peritheciis ostiolo

excepto
abditis; ascis octosporis; sporidiis oblongis magnis obliquis, 3-
septatis.

On *Acer* and *Robinia.* Car. Inf. No. 1789, 2342.

Virginian

Mountains. No. 3325. New York, Sartwell. No. 2656. >Tew England, Sprague. No. 5306.

Perithecia covered by the cuticle, with the exception of the ostiolum, which pours out the dark oblcmg or cymbiform triseptate sporidia, with connected endochromes, '003 long; nearly related to the last, but with eight sporidia, which are longer.

978. Massaxia atzoinquinans. B. <fc C—Peritheciis abditis ostiolo punctiformi tantum erunipente ; sporidiis oblongo-ellipticis 3-6-septatis.

On *Platanus*. Car. Inf. No. 1897. Ravenel. '544. Pennsylvania, Michener. No. 5169.

Entirely concealed by the bark, with the exception of the minute ostiolum ; sporidia oblong-elliptic, sometimes pttenuated below with from three to six septa, at first surrounded by a gelatinous border, *002 long.

979. Massaria epileuca. *B. fy C*—Peritheciis depressis tomentosis, in stratum album insidentibus; cstiolo demum insigniter perforato ; sporidiis cymbiformibus triseptatis, apud septa constrictis.

On *Morus rubra*. Car. Sup. No. 31. Oar. Inf. No. 1146, 2212,3591. Pennsylvania, Michener. No. 3524.

Perithecia depressed, tomentose, ostiolum at first papillarform, then opening widely; sporidia large, cymbiform, triseptate, constricted at the septa, at first surrounded by a gelatinous border.

* Massaria gigaspoxa. *Dcsm.*—On *Viburnum prunifolium*. Penn sylvania, Michener. No. 4126. On *Viburnum dentatum*. No. 4067. In 4128 I find the sporidia -003 long, with connected endochromes.

980. XKEassaxia sudans. *B, 8f C.*—Omnino tfecta ; peritheciis circinantibus ; ascis linearibus, sporidiis oblongis uniseptatis.

On bark of *Acer*. Car. Inf. No. 3866.

Perithecia circinating, covered by the bark, pouring out the dark oblong uniseptate obtuse sporidia, -0016 long.

* **Capnodium elongatum.** *B. 8f Ifesm.*—On *Alnus serrulata*. Car. Inf. No. 3803. On Peaches. No. 4030. On *Smilax*. Ravenel. No. 1659. On *Populus angulata*. On *Lbiodendron*. Pennsylvania, Michener. No. 3579. On *Bignonia** Alabama, Peters. No. 6335. On *Rubus*. New England, Sprague. No. 5779.

981. Capnodium pelliculosum. *B. fy[1] Rav.* — Floccis mycelii erectis apice trifidis ; peritheciis elongatis brevioribus.

On leaves of *Pninus.* Car. Inf. Ravenet No. 1345.
Threads of the mycelium erect, trifid at the apex, after the fashion of *Triposporium,* shorter than the oblong constricted perithecia.

* **Capnodium quercinum.** *B. fr Desm.*—On *Quercus obtusiloba.*
Car. Inf. No. 2051.

* **Capnodium avellanum.** *B. fy Z>esm.—0n Populus angulata.*
Car. Inf. No. 1639.

9S2. **Capnodium pini.** *B. 8f C.*—Mycelio laxo floccis in peri-thecia rcpentibus et cum iis cbnjunctis, sporidiis oblongis quadri-septatis.

On pine bark. Maine. No. 5689.

Mycelium loose, the threads running up the perithecia, and at length connate with them; sporidia 6blong, quadriseptate, with occasional vertical septa.

983. **Capnodium** pomoxum. *B. §- C.* — Mycelio obsoleto; peritheciis kevibus variis ovato-lanceolatis vel obovatis furcatisve pedicellatis.

On decayed apples. Car. Inf. No. 3274. Mycelium obsolete ; perithecia various, smooth, sometimes ovato-lanceolate and divided at the base, sometimes obovate or saddle-shaped, with a cylindrical dark pedicel.

984. Isothea nyss®. *B. fy c.*—Nitida in maculam vix latiorem sita ; ascis oblongis, sporidiis breviter fusiformibus, demum fenestratis.

On leaves of *Nyssa aquatica*. Shining, penetrating the leaf, seated on a little brown spot not much wider ; asci oblong; sporidia shortly fusiform, not three times' longer than broad, at length fenestrate.

985. **Perisporium fimeti.** *B. §* C—Minutum sparsum, ascis
ellipticis ; sporidiis oblongis ellipticisque plurimis.

On rabbits' dung. Car. Inf. No. 2318,2318 bis.; very minute, scattered; asci broadly elliptic, sporidia numerous, oblong or shortly elliptic, brown.

986. **Pexisporium Zee.** *B. & C.*—Peritheciis seriatis basi subtilitcr tomentosa, ascis lanceolatis, sporidiis breviter fusiformibus angustis triseptatis.

On *Zea.* Car. Inf. No. 3030.

Forming short black lines ; perithecia surrounded by short villous hairs; asci lanceolate ; sporidia shortly fusiform, triseptate, slightly constricted at the septa.

987. **Pexispoxium Wrightii.** *B. Sf C* — Congestum nigerrimum, ascis brevibus obovatis ; spovidiis subglobosis.

On *Opuntia macrorhiza.* Texas, Wright. No. 3783.

Perithecia crowded into suborbicivlar patches, jet black ; granulated ; asci short, obovate ; sporidia subglobose ; endochrome lilac, forming a cloud at the edge ol the water.

* **Wicrothyrium smilacis.** *D'Not.* — On *Smilax rotnndifoh'a.*
Pennsylvania, Michener. No. 4130. Car. Inf. No. 2365 2104
15G2.

* **Microthyirium microscopicum.** *Eesm.*—Pennsylvania, Michoner. No. 3946. On *Symphoricarpv.8.* No. 3567. On *Chelone glabra.* No. 3559.

On *Bhus glabra*. Michener. No. 3497. Sporidia narrow

'

oblong, triseptate, '001 long. There are several other species in the collection but without fruit.

* **Dichaena faginea.** *Fr.*—On bark of beech. Car. Sup. No. 939. Ohio.

* **Dichama quercina.** *Fr.*—On oak bark. Car. Inf. No. 2360 (Ravenel. N. 1607). There is also a Dichaenaon *CyriRa racemi-Jlora* and *Vaccinmm*. Car. Inf. No. 1108 (Ravenel. No. 1601), and a very similar one, Alabama, Peters, No. 4006, on oak, which I take to be a form of *D. quercina*. No. 4854, Alabama, Beaumont, on *Magnolia*, is *Strigula Feei*, Mont. Nicaragua, Wright, No. 5478, some species in an incipient condition.

* **Meliola amphitzicha.** *F?*\—On *Rhyncospora miliacea.* Car. Inf. No. 982, 1636. Nicaragua, Wright. No. 5480. On *Garrya*. Texas, Lindheimer. No. 3644. On *SabaL* Alabama, Beaumont. No. 4618, 4875bis. 4875.

* **Meliola fuzcata.** *Lev.*—On leaves. Nicaragua, Wright. No. 5486.

988- **Meliola Bacchaxidis.** *B. § Raw*— Peritheciis globosis laevibus floccis flexuosis quandoque furcatis ; sporidiis oblongis angustis uniseptatis.

On leaves of *Baccharis*. Car. Inf. (Ravenel. No. 1355).

Perithecia globose, even; threads waved, sometimes forked; sporidia oblong, narrow, uniseptate.

There are several other numbers which cannot be exactly-defined. No. 6365, on *Galax rotundifolia*, witliout perithocia. On *Arundinaria*, Car. Inf. No. 1804, Ravenel, No. 675, with *Puccinia Awmdinaria*, Schwein. On *Laitrvs Caroliniensis*. Car. Inf. No. 2069, 1028, 1189. On *Mitchella repens*. No. 1614.

* **Phyllactinia guttata.** *Lev.—On-Grossularia*. Car, Sup. No. 4458. On *Barberry*. New England, Russell. No. 5969. Pennsyl vania, Michener. No. 3474. On chesnut. No. 3473. On *Cowius fiorida*. No. 3472. On *Celastrus scandens*. Pennsylvania, Michener. No. 3484. Amherstberg, Dr. Maclagan. No. 433. On beech. Alabama, Beaumont. No. 5088.

* **Phyllactinia Candollei.** *Lcr.*—Canada, Poe. No. 6164.

* **Podosphcera Kunzei.** *Lev.*—On *Cefasns*. Dr. Maclagan.

No.
256. Alabama, Peters. No. 4556.

* **Sphaexotheca Mozs Uvae.** *CSchrveinj*—On grapes. No. 5416.
Sporidia -0006 long.

* **Ezysiphe graminis.** *B.C.—On* wheat. Car. Inf. No. 3083.

* **Erysiphe Maztii.** *Lev.*—On *Eupatorivm Ageratoideum.* Car.
Sup. No. 4427. Canada, Poe. No. 6151. On pea leaves.
Massachusetts. No. 3383. Pennsylvania, Michener. No. 3569.

* **Eiysiphe Montagnei.** *Lev.—On Xanthium stmmarium.* Car
Inf. Ravenel. No. 1136.

*** Erysiphe communis.** *Lit.*—Canada, Poe. No. 6147, 6150, 6156-. On apple leaves. No. 6148. On *Cratcegus.* Alabama, Peters. No. 4540. On *Galium.* Mountains of Virginia. No. 3334. On *Ranunculus acris.* Massachusetts. No. 2390. On *Senecio hieraciifolia.* Pennsylvania, Michener. No. 3522. On *Clematis Virglnica.* No. 3528. On *Senecio auriculata.* Car. Inf. No. 3400. On *Scutellaria lateriflora.* Pennsylvania, Michener. No. 3550. On *Verbena urticifolia.* No. 3289.

989. **Erysiphe spadicea.** *B. 8f C.*—Peritheciis spadiceis, appendicibus flexuosis ; sporidiis quaternis.

On leaves of *Xanthium.* Car. Inf. No. 2984. Perithecia scattered, rich brown, appendages flexuous, three times longer than their diameter; sporidia four.

990. **Erysiphe polychaeta.** *B. & C.*—Maculis orbicularibus ; appendicibus brevibusplurimus rectis; ascis elongatis clavatis.

On leaves of *Celtis.* Alabama, Peters. No. 3876.

Spots orbicular, yellow-brown in the centre from the young perithecia ; appendages about equal to their diameter, straight; asci elongated, clavate.

* **Erysiphe horridula.** *Lev,*—On leaves of *Xanthium.* Pennsylvania, Michener. No. 3471. Car. Inf. No. 3231.

* **Erysiphe Phlogis.** *Sclmein.*—Massachusetts, No. 3684.

* **Erysiphe Chelones.** *Sclmein.*—Pennsylvania, Michener. No. 3498.

991. **Exysiphe fuscata.** *B. $ C.*—Tot a fusca; appendicibus quandoque furcatis; sporidiis octonis.

On leaves of *Bidens frondosa.* Pennsylvania, Michener. No. 3526.

Perithecia bright brown , appendages tiark, sometimes forked at the apex; sporidia eight.

* **Uncinula adunca.** *Lev.*—On *Populus.* Canada, Poe. No. 6152, 6166. On *JEsculus Pavia.* Car. Inf. No. 4035. On elm. Alabama, Peters. No. 4597.

992. **Uncinula spiralis.** *B.Sc C.*—Appendicibus longis flexuosis apice spiralibus.

Qn leaves of *Vitis Labrusca.* Pennsylvania, Michener. No. 36i0.

Forming thin white patches, in which the younger perithecia are

pale, the older dark brown; appendages long, flexuous, with two spiral turns at the apex; sporidia about six, rather narrow, elliptic.

993. **Uncinula polychaeta.** *B. Sf* C.—Peritheciis sparsis ; appendicibus multis.

/ On leaves of *Celtis occidentalis.* Car. No. 5619. (

Perithecia scattered ; appendages about 28, li longer than the diameter of the perithecia, hyaline.

994. Uncinula subfusca. ***B. Sf C.*****—Peritheciis in maculas albas farinaceas insidentibus ; appendicibus longioribus basi subfuscis.**

On leaves of *Ampelopsis quinquefolia,*

Peritbecia seated on mealy spots, smaller than in the last; appendages more than twice as long as their diameter, brownish below, almost spirally twisted at the apex, about 16 ; asci short; sporidia about six.

995. Uncinula intermedia. ***B. Sf C.*****—Peritheciis in maculam latam candidam insidentibus ; appendicibus plurimis; sporidiis majoribus.**

On leaves of elm. Alabama, Beaumont. No. 4853.

Spots broad, white; perithecia black, surrounded by numerous appendages (more than 30), spiral at the apices; sporidia three, elliptic.

*** Micxosphaexia Gxossulaxise.** ***Lev.*****—On *Sambucus Canadensis.* Pennsylvania, Michener. No. 3482.** >

*** micxosphaexia Fxiesii.** ***Lev.*****—On lilac leaves. Car. Inf. No. 3208. Missouri, Engelnian.**

*** Micxosphaexia IMEougeotii.** ***L6i*****—On leaves of *Desmodium Dillenii.* Pennsylvania, Michener. No- 3517.**

996. Micxosphaexia semitosta. ***B. $ C.*****—Mycelio parco ; peritheciis sparsis; appendicibus deorsum abrupte fuscis; sporidiis quaternis.**

On leaves of *Cephalanthus.* Car. Sup.

Mycelium sparing; appendage forked three times, more than twice as long as the diameter of the perithecia; abruptly brown at the base ; sporidia four.

997. Micxosphaexia Euphoxbiae. ***B. §• C.*****—Mycelio effuso ; appendicibus lougissinris furcatis apicibus furcato-lobatis.**

On leaves of *Euphorbia.* CaT. Inf. No. 2983. Ravenel. No. 1125.

^ Mycelium ample; appendages many times longer than the diameter of the perithecia, once or twice forked, then lobed at the tips.

*** Micxosphaexia penicillata.** ***L6i*****—On oak leaves. Car. Inf. No. 3745. Hporidia from four to eight. On *Quercus nigra* with *Cronarthmi.* Car. Inf. No. 3078. Ravenel. No. 1324. On *Quercus aquatica.* On *Lonicera sempervirens.* Pennsylvania.**

No.
3423. On *Andromeda ligustrina.* Car. Inf. No. 2985. On *Viburnum acerifolium.* Pennsylvania, Michener. No. 3476.

998. Micxosphaexia Ravenelii. .B.—Mycelio effuso albido; appendicibus pluries furcatis.

On leaves of *Gleditechia.*

Mycelium effused, dirty white; appendages repeatedly forked towards the apex,much more so than in the last.

* **Micxosphaexia Hedwigii.** *Let:*—On oak leaves. Alabama, Beaumont. No. 5105.

* **Acxospexmum** compressum. *Todc.*—On cow pea. Car. Inf. No. 6179.

999. **Acrospemum Ravenelii.** *B. fy* C—Clavatuin breve ascis elongatis; sporidiis filiforrnibus.

On leaves of *Cei-cis, Vitis* and *Fraxinus.* Car. Inf. Tso. 1928, 2021.

Minute, short, slightly attenuated downwards, at length somewhat clavate; asci long, linear, flexuous ; sporidia long, filiform.

1000. **Acxospexmum foliicolum.** £.—Elongatum clavatum pulvevulentum, ascis elongatis ; sporidiis filiformibus.

On fallen leaves of elm. Car, Sup. No. 1786. Car. Inf. On *Celtis.* No. 1957. Ravehel.

Much larger than the last, distinctly clavate, slender below, pulverulent ; asci and sporidia the same.

1001. Acrospermum **vixidulum.** *B. $ C.*—Breve, virescens obtusum ; ascis brevioribus.

On decayed herbaceous stems. Car. Inf. No. 1135. Very short and obtuse, greenish; fruit as in the neighbouring species, but the asci are shoiter.

* **Euxotium hexbaxioxum.** *Lit.*—On Wood. Pennsylvania, Michener. No. 4360. On *Polyporus.* Massachusetts, C. J. Sprague. No. 4896.

* **Chaetomium elatum.**s *Kze.*—On herbaceous decayed stems. Car. Inf. No. 5022. On *Carex.* Sartwell. No. 3260.

* **Chaetomium chart arum.** *Ehrb.*—On damp paper. Car. Inf. No. 3712.

Glenospora. *B. % Cvrt.*—Flocci fastigiati fasciculati parce arti-culati, hie illic sporangia globosa sessilia vel pedicellata ferentibus.

1002. **Glenospora Curtisii.** *B. ds Desm.*—On *Nyssa, Quercus,* and *Cyrilla.* Car. Inf. No. 2088, 2776, 3059, 3060.

Forming black hispid patches, consisting of fascicles of fastigiate threads, which bear here and there globose sporangia.

* Antennaxia semiovata. *B. Sf Br.—On* leaves of *Kahnia latifoUa.* Car. Inf. No. 2032. Ravcnel. No. 844.

The sporangia are more free than in the British specimens, but there seems to be no essential difference.

On *Magnolia glanca.* Alabama, Beaumont. No. 4017, is another form.

ADDENDA.

1003. **Lenzites Cookeii.** *Berk.*

- Pileo duro tenui, cervino zonato lineato-rugosulo; margine tcnui; contcxtu ex albo subceivino; hymenio albido; poris elongatis radi-antibus.

In trimGOS einortuos *Salicls* et Betulaj.
New York, Aug , Oct. (Peck, 391.)

1004. Lenzites pxoxima. *Berk.*

Pileo tenai applanato, subtiliter tomentello umbrino ; contextu molli concolore; hymenio pallido ; poris elongatis radiantibus.
New York, Sartwell. No. 5176. Same size* as the last.

1005. Hymenochaete **Ellisii.** *B. 8f Cooke**

Tcnuis papyracea, a matrice separabilis, primam pallida, deiu ccntro cinnamomeo ; margine tenerrimo.
On pine boards. New Jersey, U.S. (J. B. Ellis.)

[NOTE.—A larger amount of space than usual has been devoted to these descriptions of North American Fungi in order to complete the series in the present volume of *Grevillea,* which has now been accomplished. To the Kev. M. J. Berkeley our thanks are due, for undertaking the large amount of labour involved in the description of upwards of 1000 species, many of which have borne their MSS. names for years.—ED. *Grevillea.*~\

ON THE SPERMATIA OF THE ASCOMYCETES.

By M. MAX. CORNU.

(Translated from " Comjptes Rendus de VAcade'mie des Sciences,[n] *3rd April,* 1876.

The polymorphism of Fungi has hitherto been considered an indisputable fact; the magnificent works of M. Tulasne have established this upon buch solid bases that no one has since been able to shake it. The splendid work which includes these researches, extending through several years, is the " *Selecta Fun-goi*[y]*um Carpologia"*

We see here that the *Ascomycetes* possess four modes of reproduction ; 1st, by the asci, containing spores, generally eight in number ; 2nd, by the stylospores; 3rd, by the spermatia ; 4th, by the conidia.

The spermatia have been regarded by M. Tulasne as fecundative corpuscles ; their immense number, their small size, the presence of other spores which germinate with rapidity, the facility with which water dissolves the gum which unites them, and allows of their separation, the necessity of a fecundatory act, evident for the formation of the perithecia, have caused this hypothesis. That which supported this view was principally their refusal to germin-ate,under conditions where the three other sorts of spores were easily developed.

A work submitted, three years ago, to the judgment of the

Academy,* showed that this theory might be combatted by some solid reasons. M. Tulasne, likewise overthrew it, so to say, with his own hands, by showing the development of *Pyronema confluens* and other *Discomycetes,* a development due to the conjugation'of two sorts of organs, the one male and the other female.

I have been able to obtain, in a very complete manner, in certain cases, the germination of the spermatia, hitherto considered devoid of the germinative faculty ; in other cases, the considerable modification of these small bodies under the action of water and warmth united to that of the oxygen in the air, although these agents were reputed as without effect, showed that the spermatia are probably capable of producing a mycelium, like the other spores. At times, the action of pure water sufficed to make them vegetate; in other cases, and more often, it is necessary to add some nutritive element. In studying the *Carpologia* with care, it is easy to see that the author had already sometimes obtained this germination *(DoJiidea 7nelanops7 Cenangium Bibis,* &c.) ; whence some terms are derived which represent it, called by the names of *microstylospores, micro-conidia* or spermatiform *stylospores.* In many genera, spermati-form stylospores exist among certain species, whilst among other allied species they are exclusively veritable spermatia; I am attacking myself in this last case, and I have been able *(Valsa amhiens, V. salicina)* to obtain a development of these small bodies which ought theiefore to be considered as of the same order as the otheis. When the stylospores are not enclosed in cavities, their homologous **form takes the name of *chlamy do spores* or *macroconidia ;* the** *microstylospores* are designated simply under the name of *conidia.* In support of what has been said above, one sees that the conidia are the representatives of the spermatia which would be free and not contained in a special cavity. If one studies with care the different forms of conidiferous or spermatiferous apparatus, one sees that they present a great number of forms which pass from one to the other in an insensible manner. The more important transitions are furnished by the genus *Ilypomyces,* which leads from a form imitating the dendritic spermatisphores to the complicated form of the Mucedines *(Selenosporium* and *Fusispnrium) :* it suffices to study //. *ochraceus* and //. *rosellus* in order to be easily convinced. These conclusions will be demonstrated in detail, with figures, in a special Memoir which will soon be published. It is to the spermatiferous form that the conidia of *Verticillium, Acrosla-**lugmus, Penicillium, Acremonium, Cylindrophora,*** **etc., apply ; which** are probably not all forms of *Ascomycetes,* as some have stated. It is also as spermatia that the conidia of *Nectria, Nummularia, **Toriubia, Xylaiia, Poronia,*** **etc., may be considered.**

The germination of the spermatia permits the formation of two interesting conclusions: the first is relative to the old theory of fecundation, which ought now to be abandoned ; the second is more

* " Oomptes Rendus," 21 June, 1875, p. 1468.

important. It allows us, in fact, to adopt a considerable'simplifi-cation of the study of the great group of *Ascomycetes;* it unites into one two reproductive forms, rather alike in appearance, but which, physiologically, would not be compared : they may be so now. These are two homologous forms, and a crowd of intermediary ones uniting them. That which distinguishes the *true* sper-niatia, is their smallness : they appear to have been caused by a reserve of nourishment, which the whole spore bears in general with it in order to provide for its ■ first development in the humid air. They ought to fall upon an appropriate substratum, without which they would not develop. The conidia, on the contrary, easily germinate; but what unites them to the preceding, is their acro-genous production, their slight and simple envelope, the immense profusion with which they are produced, their role of dissemination, so evident among the mucedinous forms of the *Ascomycetes,* a dissemination which, as to the conidia, may be accomplished by the aid of the wind, as are the true spermatia by water and birds.

This simplification of the number of reproductive organs gives a great unity "to the polymorphism of the Ascomycetes ; it will be henceforth possible to compare the asexuous forms with them. Useless for classification and the allying of genera and species (which was united hitherto, in general, uniquely by the opening or the disposition of the ascophorous conceptacles), the conidia or spermatia will give some valusible indications in certain cases ; the morphological studies will furnish many data for the *Mucedines* which will cause them to be ranged among the Ascomycetes, and to quit their heterpgenous group, which still contains too great a number of representatives. It was singular, in the hypothesis of a fecundative role, to see the spermatia wanting in many of the genera, and notably among the more numerous species, *Ilypocrea, Xylaria, Torvubia,* etc.; the spermatia and the conidia are morpho logically identical, these are two homologous forms having the same role, and scarcely differing from one another : these two terms ought to be held as synonyms. » - *

With this explanation, the word *spermatia* can, and ought, to subsist in this part of the science which M. Tulasne has enriched with such remarkable discoveries.

[We think that had M. Cornu at once discarded the term " spennatia," when convinced that they had no fecundative function, his communication would have been more lucid. We cannot agree with him that the term should be retained with a *new* interpretation, which is only likely to create confusion. If *spennatia* do not possess the function usually attributed to sper-matia it is better not to call them by that name.—ED. *GrevilleuJ]*

NEW BRITISH FUNGI. *CQontinuetiL from p.* **114.)**

The following enumeration will include the species recently published by Messrs. Berkeley and Broome : —

Agaxicus (Axmillaxia) bulbigex. *A. $ S. Fries Epic. p.* 4O.f

Pileus fleshy, convex, then expanded, obtuse, even ; stem stuffed, equal, marginate bulbous, pallid, fibrillose, ring oblique, fugacious, gills emarginate, pallid.—*Fries Icon. t.* 26,/. 2. *Klotsch, Floi\ Bor., t.* **373.** ***Berk. & Br. Ann. N.H., No.* 1501.**

In pine woods. Hereford. Oct.

Bulb very distinct. Pileus grey, rufescent, or pallid, at first fibril-lose, then naked, soft.

Agaricus (Axmillaxia) xobustus. *A. $ 8. Fries Epic,* 41.

Pileus fleshy, compact, convexo-plane, unequal, smooth, margin and stem solid, short, attenuated downwards, rooting, fibrillose above the ring, white below, gills emarginate, attached, whitish.— ***Berk. & Br. Ann. No.* 1502.**

In woods. Rannoch.

Flesh very firm. Taste and smell exactly that of *Polyporus squamosus.*

Agaxicus (Tricholoma) loxicatus. *Fries. Ep. p.* 60.

Cartilaginous, tough ; pileus campanulate, then convex, some-what undulated, rather inclined to be viscid when moist, subpa-pillose, cuticle distinct, horny, stem somewhat hollow, equal, rooting, striato-fibrillose ; gills attenuated, then free, crowded, pallid. ***—Fries Icon. t.* 35, /. 2. *Berk. & Br. Ann., N.II. No.* 1503.**

In woods. Glamis.

Viscid. Remarkable for the thick coat of the pileus. Pileus 1 -2 in. broad ; stem 2-3 in. long. $_m$ Odour nauseous.

Agaxicus (Txicholoma) vixgatus. *Fries Ep. p.* 62. *Icon.t.* 34,/. 1.

Rigid ; pileus fleshy, convexo-plane, somewhat umbonate, very dry, becoming smooth, streaked with innate black lines and scales, margin at fiist naked ; stem solid, stout, striate, smooth, white; gills emarginate, crowded, becoming greyish.—*Berk. $ Br. Ann. N. H., No.* **1504.**

In woods. Forres.

Solitary, large. Pileus cinereous.

Agaxicus (Txicholoma) leucocephalus. *Fr. Ep. p.* 71. *Icon. t.* 43., /. 2.

Wholly white; pileus fleshy, thin, convex, then plane, even, moist, veil silky, evanescent, smooth, margin patent, naked ; stem

hollow, cartilaginous, tough, rooting, even, smooth ; gills rounded behind, free, crowded.—*Bet k. $• Br. An. N. H.*$_{y}$ *No.* 1505. On the ground. Bowood. Oct. Odour strong of fresh meal.

Agaxicus (Tricholoma) militaris. *Lasch. Fr. Ep.p.* 71.

Pileus compact, flexuous, becoming smooth, viscid, cinnamon ; margin even ; stem solid, squamulose, fibrillose, pallid, rather bulbous at the base; gills emarginate, somewhat crowded, whitish, at length with lurid spots and lacerated.—*Berk. & Br.* ***Ann., N. H.,* 1506.**

In woody places. Glamis.

Stem 4^ in. long. Pileus 4-7 in. broad. Odour and taste unpleasant.

Agaxicus (Tricholoma) civilis. ***Fr.** Ep.p.* **71.**

Pileus fleshy, soft, convex, then plane, smooth, moist, ash-coloured, becoming pallid; cuticle separable; stem solid, soft, fragile, fibrillose or squamulose, whitish ; gills deeply emarginate, crowded, white then yellowish, not spotted.—*Fries Icon. t.* 42,/. 1. ***Berk, & Br. Ann., N. H., No.* 1507.**

In pine woods. Epping. Oct. **Agaricus (Clitocybe) subalutaceus.** *BatscK Fr. Ep.p.* 84.

Yellowish, growing pallid ; pileus fleshy, soft, convexo-plane or depressed, obtuse, unequal, smooth ; stem stuffed, firm, elastic, naked ; gills adnato-decurrent, broad, rather distant, becoming **whiter.** ***Batsch,fig.* 194.—*Berk. $ Br. Ann. N. H.*9 *No.* 1509.**

Under *Ilex.* Oxton. Exeter. Nov.

Smell like that of *A. putridus* and *A. rancidus*, peculiar.

Agaricus (Clitocybe) gilvus. *P. Fr. Ep. p.* 95.

Pileus fleshy, compact, convex, then depressed, obtuse, smooth, moist; stem fleshy, solid, stout, smooth, nearly equal ; gills de-current, very much crowded, thin, branched, and as well as the flesh pallid, then ochraceous.—*FL Dan.* ***t*** 1011. *Berk. $f Br. Ann.* ***N. H., No.* 1508.**

In pine woods. West Farlegh.

Pileus scarcely infundibuliform.

Agaxicus (Clitocybe) splendens. *Fr. Ep.* 96, *p. Icon. t.* 44, / 1.

Solitary. Pileus somewhat fleshy, flatly infundibuliform, smooth, shining, ash-coloured, becoming yellowish; stem solid, smooth, of the same colour ; gills deeply dccurrent, crowded, simple, white. —***Berk. $ Br. Ann. N. H., No.* 1510.**

In wood . Reading.

Agaricus (Clitocybe) expallens. *Fr. Ep. p.* 100.

Pileus between fleshy and membranaceous, flatly infundibuliform, even, smooth, becoming tawny, when dry clay-coloured, then whitish ; margin scarcely expanded; stem stuffed, then hollow, equal, whitish, silky above; gills decurrent, rather distant, whitish **grey.—*Berk. & Br. Ann. N. H. No.* 1511.**

In woods. Glamis.

Smaller and paler than *Ag. cyathiformis.* **Agaxicus (Clitocybe) concavus.** *Scop. Fr. El. p.* 102. *Icon. t.* 57,/. 2.

Pileus submembranaceous, broadly and deeply umbilicate, even, flaccid, naked, hygrophanous, edge convexo-plane,

undulated ;

stem stuffed, equal, smooth, grey; gills decurrent, crowded, narrow, fuliginous.—*Berk, & Br. Ann. N.H., No.* 1512. In pastures. Batheaston.

Pilcus 1-2 in. long; stem 1-2 in. long, 1-2 lines thick, wholly soft, fibrous.

Agazicus (Collybia) rancidus. *Fr. Ep. p.* 125. Strong scented. Pileus rather fleshy, convex, then plane, urn-bonate, even, tough, whitish, silky; stem-fistulose, straight, rigid, rooting, smooth ; gills free, crowded, narrow, cinereous.—*Fries* ***Icon. t.* 69, /. 1. *Katchbr. t.* 6,/. 4. *Berk. & Br. Ann. N.H., No.*** 1513.

Under cedars. Burnham Beeches. Nov.

The smell is very peculiar; the gills very dark so as to be easily mistaken for those of a *Hebeloma.*

Agazicus (Collybia) ventricosus. *Built.* 411, *f.* 1. *Fr. Ep.p.* 120. Pileus rather fleshy, campanulate-convex, umbonate, smooth ; stem fistulose, even, naked, becoming rufescent, ventricose at the base, rooting; gills arcuate, affixed, ventricose, broad, rather crowded, undulated, rufescent.—*Berk. §• Br. Ann. N.U., No.* 1514.

In woods. Bathford. Oct.

Agazicus (Omphalia) mauzus. *Fr. Ep. p.* 156. Pileus somewhat membranaceous, convex, deeply umbilicate, smooth, striate, hygrophanous, even when dry, silky, shining; stem somewhat fistulose, thin, rigid, straight; gills truly decurrent, arcuate, very much crowded, white.—*Fries Icon. t.* 73, /. 2. *Berk.* ***4- Br. Ann.N.H., No.* 1515.** On lawns. Coed Coch.

Agazicus (Mycena) auzantio mazginatus. *Fr. Ep.p.* 131. Pileus rather fleshy, campanulate, expanded, subumbonate, even ; stem even, smooth, ventricose, strigose ; gills attenuated behind, adnexed, greenish pallid, edge fringed with orange flocci.—*Flor. Dan. t.* **1292,/. 2. *Berk. $ Br. N.H., No.* 1516.** In pine woods. Perth. Nov.

Has a peculiar aspect, looking more like a *Marasmius* than a *Mycena.* Stem very brittle, fistulose; smell strong; margin striate.

Agazicus (Mycena) excisus. *Lasc7t. Fr. Icon.t.* 81,/. 1. Pileus campanulate-convex ; disc rather fleshy, subumbonate, rngulose ; stem firm, tough, rooting, even, becoming tawny ; gills ventricose, thick, distant, connected by veins, narrowed and incised **behind, nearly free.—*Fries Epic. p.* 138. *Berk. & Br. N.H., No.*** 1517.

On trunks or on the ground. Glamis.

Agazicus (Mycena) psammicola. *B. <$ Br. Ann. N H.> No.* 1518. Pileus subhemispherical, hygrophanous, sprinkled with minute particles; margin striate ; stem short, solid, rooting, umber below, white above, wholly whitish-pulverulent; gills segmentoid, shortly adnate, sinuated behind ; odour strong, but not nitrous.

On a sand bank, amongst moss. Addington. Sept.

Pileus 3 lines across, stem not 6 lines' high, about ^ a line thick, firm ; pileus brown, becoming paler towards the margin. A small but well-marked species.—*B. fy Br.*

Agaxicus (Mycena) metatus. *Fr. Ep.* 142.

Soft, strong-smelling; pileus submembranaceous, obtuse, striate, hygrophanous, even when dry, opaque, whitish ; stem firm, even smooth, fibrillose ajt the base; gills adnate, thin, distinct, linear, whitish.—*Paul t.* 99,/. 8. *Berk. $ Br. Ann. N.H., No.* 1519.

Amongst moss. Forres. Oct. Agaxicus (Mycena) collaxiatus. *Fr. Ep. p.* 146. *Icon. t.* 82,/. 5.

Pileus membranaceous, campanulate-convex, subumbonate, striate, becoming pale, smooth ; stem filiform, thin, smooth, shining; gills adnate, with a collar, thin, crowded, distinct, whitish, or pale flesh-coloured.—*Berk.* ($• *Br. Ann. N.H., No.* 1520.

Amongst grass. Glamis. Addington.

Pileus ^ inch or more broad, tawny, or greyish.

Agaxicus (Mycena) debilis. *Fr. Ep. p.* 145.

Tender. Pileus membranaceous, campanulate, convex, obtuse, striate, becoming even when dry, rugalose, brownish, opaque; stem filiform, capillary, lax, flaccid, fibrillose at the base; gills broadly adnate, distinct, whitish.—*Fines Icon. t.* 82,/. 4. *Bull* 518, /. P. *Berk. & Br. Ann. N.H., No.* 1521.

In a chestnut wood. Wrotham. Oct.

Colour whitish, flesh-coloured, livid, or tawny.

Agaxicus (Pleuxotus) pulmonaxius. *Fr. Ep. p.* 176.

Horizontal. Pileus fleshy, soft, rather convex, obovate, or reni-form, smooth; stem lateral, straight, very short, villous ; gills plano-decurrent, simple, whitish, becoming livid.—*Fries Icon. t.* 87,/. 2. *Berk. $ Br. Ann. N.H., No.* 1522. *Puulet. t.* 21.

On trunks. Aberdeen.

Pileus from greyish to tan-colour.

CARPOLOGY OF PEZIZA.

[Plate LXIX.]

ALEURIA.

Fig. 302. Feziza dochmia, *B. 8f C,* ex. herb. M. J. B.
„ 303. P. euplecta, *0.* (P. phlebophora, *B. Sc C.* var.) ex. herb., M. J. B
„ 304. P. coelopus, *Mont.,* in herb. Paris.
„ 305. P. Valenzuelse, *B. $- C,* ex. herb. M. J B
„ 306. P. ingeqnalis, *B. $* C, ex. herb. M. J. B.
„ 307. P. catiniis, *Holms.,* in herb. Paris.
„ 308. P. micropns, P., ex. herb. M. J. B.
„ 309. P. rapulum, *Bull,* ex. herb. M. J. B
„ 310. P. ciborium, *Vahl.,* ex. Fries in herb*. Berk
„ 311. P. lechria, *B. fy Br.,* ex. herb. M. J. B.
„ 312. P. Valenzueliana, *Mont.,* in herb* Paris.
„ 313. P. chrysopela, *C,* Rav., No. 1492.
„ 314. P. nebulosa, C, Rav., No. 812.

NOTE ON *PEZIZA CALYCINA*.

BCHUM. *By* DR. REHM.

Haec, ut videtur, optime nota et distincta species, tamen micros -copice et chcmice examinata iterum in duas species separanda est, extus sane simillimas.

a. **Peziza calycina.** *fSchwn.) Rehm.*

Exs : Cooke, f. brit. I., 474. II. 369, A. B.

Sporidia elliptica, long, 0,015-18, lat. 0,005. Ascitenues. Apex ascorum ope solution!s aquosae Iodii *non* coerulescit.

***b*. Peziza laricis.** *CCoeJte.J Behm.*

Sf/n: Peziza calycina y. laricis, Gooke Hdb. p. G85. *Exs :* Fuckel f. rhen. i.206. Rehpa ascomyc, *62. Thiimen hb. myc. oec. 191 (aub. P. Wilkomii Hartig.) Cooke f. britt. TI. 370.

Sporidia obtuso-elliptica, long. 0,016-18, lat. 0,006-7. Apex ascorum crassorum ope solutionis aquosae Iodii *coerulescit.*

• Crescit in ramis emortuis Pini Laricis eamque his arboribus valde nosci am fieri dicitur (cf. *Sorauer,* Pflanzenkrankheiten, p. 389.)

Qua3 a Nylandero in " Pezizae Fen. p. 24," de Peziza calycina dicuntur, propter parvitatem sporar.um cum una alterave specie supra notata non congruunt. Neque exemplaria nuper sub. " P. calycina" a cl. Ellis ex Amerika septentrionali comunicata hanc speciem sistunt.

Sit—

Feziza Ellisiana. *Behm.* nov. spec.

Apothecia sparsa, primitus hemispha'rica, dein breviter stipitata atque dilatata, c. 1-2 mm lato, luteo-villosa, epithecio aurantiaco-concaviusculo. Sporae fnsiformes, utrinque acuminatse, sim-plices, hyalinae, long. 0,018, lat. 0,0025; biseriatse in ascis clu-vatis sessilibus, long. 0,045-60, lat. 0,006-7.

Paraphyses filiformes, ascos superantes, septatae, c. 0,002 crass.

Pili perithecii dilute viridi-lutescentes, obtusi, simplices, scabri, c. 0,006 crass.

Apex ascorum Iodii ope *coerulescit.*

DR. MED. REHM.

Lohr a Main (Bayern).

OBSERVATIONS ON PEZIZA CALYCINA. *By*

M. C. COOKE.

The foregoing note by Dr. Rehm necessitates a few observations from us *apropos* of the two species which he proposes to recognise, based on the variability of *Peziza calycina*.^

It must be premised that extensive examinations have convinced

us that some species *oi Peziza* are much more variable than others, **such for instance as *Peziza scutellata* and *Peziza calycina.* This,** however, should cause us hesitation in constructing or accepting new species based on such variability.

Dr. Rehm proposes *Peziza laricis*, on what we consider an untenable basis, for reasons which we will presently detail. The grounds on which Dr. Rehm's proposition rests, are apparently three, viz.:—

1. Size and form of sporidia.
2. Texture of the asci.
3. Reaction with tincture of iodine.

First.—As to the size and form of the sporidia. However much a difference in size and form of sporidia may be valued in the determination of the limits of species, it is clear that these differences must be constant, and confined to the forms separated. In the two species indicated by our correspondent he describes the sporidia thus—

P. calycina. Sporidia elliptic, "015-018 X '005 m.m.
P. laricis. Sporidia obtuse-elliptic, '016--018 X -006--007 m.m.

The differences, therefore, are simply that the sporidia in *P. laricis* are more obtuse, and broader than in *P. calycina*. If we accept the types of the two species which he gives, these will lead us to estimate the value of this distinction. These are—

P. calycina. Fungi Britt. i., 474, ii., 369, A. B."
P. laricis. Fckl. F. Rhen., 1206. Rehm Asa, 62. Thumen H. CE. Myc., 191, Fungi Britt., ii., 370.

Attention must now be directed to our plate 66, containing figures of sporidia derived from these published specimens.

Fig. *a*, is from Fungi Britt., i., 474. „ c?, is from Fungi Britt., ii., 369 A. „ *e*, is from Fungi Britt., ir., 369 B. all of these are referred to *P. calycina.*

Fig. *b*, is from Fungi Britt., ii., 370.

We have no copy of Thumen's " Herb. Myc. CEcon.," hence have been unable to figure the sporidia in his No. 191.

In our specimens of Rehm's " Ascomyceten," the sporidia unfortunately are mostly granular, and unformed in the asci, being immature, so that we could obtain no figures of the mature sporidia, which appeared to be similar to those figured at *b.*

These figures are drawn by camera lucida from the sporidia, and represent, in all cases, such free sporidia as presented themselves at the same time on the field of the microscope. These drawings have been reproduced by photo-lithography, on the plate, so that it may fairly be presumed that they are accurate delineations of the objects themselves.

From these figures it is evident that, as to width of the sporidia, there is no distinctive feature of difference between fig. *b* and the

rest, nor in the obtusity of the extremities. The length of the sporidia are not taken into account in the characteristics of the proposed species.

We would contend that there is 'a much greater probability in favour of the form represented at fig. c being accepted as a distinct species than that at fig. *b.* The figure *c* is derived from the specimens mentioned in "Grevillea," iii., <p. 121, as P. *calycina* var. *Trevelyani.* The division of the endochrome is a much more noteworthy feature in sporidia where nuclei are seldom observed, than difference in length or breadth, or obtusity of sporidia, when so great variability prevails.

The extreme variability in the length of the sporidia is remarkable in all forms of *Peziza calycina.* In fig. *a* we measured them respectively at -014, -015, -02, -023, -025, -026, -028. In fig. *b,* •015, -016, -018, -022, -024, -026, -028. In fig. c, -018, -02, -022, •024, '028, *03, -032. It may be remarked here, that in all instances only one cup from the specimen named is concerned in the figures represented, so that there can be no admixture of sporidia from other and more or less matured cups.

For further comparison we have also given the following additional figures :—

Fig./, from specimen collected at Ken Wood, near London, in which the sporidia are uniformly smaller.

Fig. *g* is from another of the specimens published in "" Fungi Britannici" (ii., 370), regarded by Dr. Rehm as *Peziza laricis.*

fig. *h,* two of the most mature asci in the only developed cup to be found on our specimen of *Peziza calycina,* in FuckeFs " Fungi Rhenani," No. 1206.

Fig. t, is from specimen named P. *calycina,* received from the late Dr. Curtis, of S. Carolina (U.S.), and which seems to be P. ***laclmoderma,*** **Berk.**

It may be remarked here, that a great number of the specimens referred to P. *calycina,* in Herbaria, are P. *subtilissima,* Cooke ("Grevillea," iii., fig. 167), as for instance, specimens we have received from Dr. Geo. Winter (Leipzic), H. W. Ravenel (S. Carolina), Prof. Hazslinszky (Eperies), A. Jerdon (Scotland), Fries's " Scler. Suec," No.3G0, Mougeot (in « Herb. Berk."), and ***Peziza pulchella,*** **Grev., in "Herb. Edinensis." The** ***Peziza calycina,*** of Nylander (" Obs.," p. 24) and of Karsten (" Myc. Fenn.," p. 154), is clearly the same species.

If it were admitted that the difference in width and obtusity of sporidia existed in the forms indicated by Dr. Rehra, to the extent alleged, we do not consider such difference to be of specific value in a species where so much variation, even beyond the limits which he assigns, is manifest.

Second.—The texture of the asci is noted. In P. *calycina.* " Asci tenues." P. *laricis.* " Apex ascorum crassorum."

We must state that we fail to recognize this difference in the specimens examined.

Third.—Eeaction with tincture of iodine. *P. calycina—not* becoming blue. *P. laricis*—becoming blue.

Whether this be so or not in fresh specimens, and under peculiar circumstances, we do not care to enquire, but, we contend that the iodine test is not trustworthy. We have found by experience that the same specimen which becomes tinted blue by ^iodine when in a fresh state, if allowed to dry tor some time, and is again moistened, affords no appreciable change; that all cups manifestly belonging to the same species, s*uch as *P. coccinea,* of which there can be no doubt, do not behave themselves in the same manner under treatment by iodine. And that change of colour produced by iodine is not infallible evidence of difference in species, but merely of different conditions under which certain individuals may have been developed. That, in fact, the conditions which induce change of colour on the application of solution of iodine to the asci, are the result of what may be termed accidental circumstances, and are not absolutely characteristic of specific forms.

Our friend, Mr. Phillips, who was at one time an advocate for iodine tests, has, we believe, lost faith in them entirely, as affording reliable evidence of identity or difference of species. We know of no one in this country who is in the habit of examining a larger number of specimens of *Peziza* than ourselves and Mr. Phillips, amounting to some hundreds of specimens in the year. We have been constantly in the habit of availing ourselves of his services to check and verify our own observations on the minute differences of closely allied species, in preparation of the figures for " Myco-graphia," and yet he never appeals to the iodine test as any conclusive argument in favour of any of his views.

Under all these circumstances, and for these reasons, we have thought it desirable at once to state our objections to Dr. Rehm's proposal, and at the same time, incidentally, to indicate what we do not regard as safe bases for specific distinctions.*

Not having seen the species described as *P. EUisiana,* we are unable to express an opinion, and it would be unfair to do so under these cii-c\mii>tanccs. The colour of the hairs of the cup, and their scabrous character, in addition to the features of the fructification, indicate specific differences, which do not come under the restrictions made with regard to the two other forms.

* Undoubtedly, if a case can be made out for the recognition of Dr. **Benin's species, and this be identical with *Peziza Willkomii* of Thumen, which Dr. Rehm admits, then Thumen's name has priority, and no new name can be received. There is no direct evidence that *Peziza Willkomii,* Hart., is different from Thumen's plant, with which the published figures of *Peziza calycina,* Willkom, will accord equally well as any other form of P. *calycina.***

THE CONIDIA OP FISTULINA.

By M. J. DE SEYNES.

[The work from which the following observations are translated appears to be too little known in tbis country, hence we have selected M. de Seynes's remarks on the conidia which he finds in *Fistulina hepatica,* as a means of introducing our readers to this valuable work.*]

One of the more curious points in the structure of *Fistulina hepatica* is the formation of the conidia, develojped, like the spores of the Gasteromycetes, in the interior of the parenchym of the receptacle. I have previously had occasion to mention this fact, but I have since had the good fortune of following the advance- . ment of the *Fistulina* from its very young state up to the complete development of the receptacle. I have had, therefore, much to determine, and certain details to modify on this subject. In the Fistulinas which have arrived at their complete development, one can determine a region which occupies the subjacent part of the superior surface of the pileus, and which, at the point which corresponds to the superior extremity of the pedicel, and which extends to a greater depth than the peripheric margin of the pileus. If one makes a cut following the axis of the pileus and of the pedicel, one can see that this region is enlarged both before and behind, the pedicel being supposed to represent the posterior part, which is in effect its natural position when one regards a Fistulina fixed to its support; and it reaches, in the part where it is the more developed, up to more than a centimeter in depth in the tissue of the receptacle. It is not prolonged up to the margin of the pileus, but terminates always at 1, 2, or 3 centimeters from this margin, and sometimes more ; so that one never finds any conidia in the neighbourhood of the hymenophore tubes : the external margin of the pileus marks, in fact, the limit between the supero-lateral exterior region and the inferior or tubular region.

If one dries with care some receptacles of Fistulina, without breaking them before complete dessication, and then makes a cut which includes the pileus arid the pedicel passing by the middle of both, one sees that the tissue is of a clear colour at the central part; whilst it is strongly coloured, if one makes the cut in the fresh state and dries it afterwards. The region in question is clearly distinguished by a reddish coloration, which marks the limits of the more intense production of the conidia ; it is terminated at the superior part by a blackish band about half a millimeter in thickness, which exists all round the cut, except at the point where the hymenophore tubes are found. If one takes any particle whatever of this zone, and places it under the microscope,

* Recherches des Vegetaux inferieurs. Pte. 1. Des Fistulines. Par J. de Seynes.

one sees that it contains an innumerable quantity of small, rounded* ovoid bodies, more or less elongated. On examining them singly, one sees that these small bodies are cells presenting a slightly accentuated envelope, tinted with a brick or salmon colour like the spores. It is difficult, by a casual glance, to recognise whether this envelope is simple or double ; but, at the moment of germination, it is very slightly denuded of its lining, and the external membrane is broken and separated. The contents are composed of a rather large oily clot and often of a smaller one, and of a transparent liquid which separates them from the membranous envelope. These cells are reproductive organs, so as to give birth to some germinative filaments; I have on account of this given them the name of conidia, to which the only signification attributed by me is that of secondary organs of reproduction, whatever may be the rest of their form, structure, or evolution. The conidia of *F. hepatica* have a rather variable form, which is always approaching to an oval, more or less elongated, or to a truncate ovoid towards the more narrow extremity. Their dimensions is from *007 mm. to #009 mm. at their greatest diameter, and from *004 mm. to •006 mm. in the lesser breadth ; more frequently are *008 mm. upon "004 mm. One finds also, but rarely, some conidia irregular, claviform, baculoid, straight or curved, presenting from •010 mm. up to .019 mm. of length.

The resemblance of the conidia with their mother cells, and of these with the cells of the receptacle, are easy to follow upon dried specimens ; on studying them upon fresh specimens, of small size, young and not damaged, one may be easily convinced, at the first sight, that these small organs have no power at all to penetrate from the outside into the interior of the tissue of the *Fistulina*. The anatomic study which follows—that of individuals exclusively gemmiparous and that of the development of the receptacle which we shall make further on—will leave, I am convinced, no doubt on the mind of anyone.

The conidia, such as I have described, are disposed upon long or short cells, but narrow, fine, and with a granular protoplasm, which divides into short branches, at the extremity at which is found a conidium. The branches are often numerous, and thus form some rather elegant bouquets of conidia; at other times one conidium only detaches itself upon the passage of a cell, and appears almost sessile; it has still at times a short pedicel. Sometimes the^ conidiophore cells present some partitions at the level of the divisions in fertile "branches, sometimes they do not. Sometimes the bouquet of conidia is elongated, and the conidiophore cell giving birth to some conidia, alternated upon two rows, takes the appearance of a rachis of grass. There have been noted a crowd of varieties, but it is difficult to decide if these differences of insertion of the conidia upon the conidiophore cell are, if I might say, congenital, or whether some of them are the result of the successive genesis of the conidia. The conidiophore cells belong to

the type described previously. £>till they are sometimes of a stronger calibre, and do not distinguish themselves from the cells of all varieties of the second type, or narrow cells, but they never proceed from chromogenous cells, or from reservoirs with a proper juice. One sees that they proceed more often from narrow cells, but more rarely still from cells more narrow than themselves ; often they take birth from cells of the tremelloid tissue. I have not contented myself by having proved the connection of the conidiophore cells with the filamentous cells of the receptacle ; in the belief that these ought not yet to be accused of belonging to a foreign mycelium, I have tried to find the point where the narrow filamentous cell bearing a conidiophore cell was the same at all as a cell of great calibre. This search has often succeeded, above all in the points where the narrow conidiferous zone was found to be allied with the more profound system of the great cells—in the pedicel, for example, a little beneath its summit.

One can prove from the figures given, and I have many other similar designs taken at different points, that there is a complete continuity between the cells of great calibre of the receptacle, and those with a narrow calibre, bearing some conidiophore cells. In reality, one might say that the difficulty is not in recognising these connections so distinct, but rather to find any part in the tissue in its normal state and its depth, a fragment of foreign mycelium. I cannot help believing that in insisting upon the differences that there are between the conidiophore cells and cells of the tissue of the *Fistulina*, M. de Bary has encountered some conidia carried, as frequently happens, upon the cells of the tremelloid tissue, which, while presenting frequent modifications which ally them with the cells of the other types, still differ rather notably, and may lead one into error, if one does not know the relations of these cells with the other cells of the receptacle.

In order to give birth to conidia, the mother cell, or conidiophore cell, divides, as I have said, and each division swells at its extremity. This swelling increases, and, in the interior, appears an oily clot bigger than the granulations of-the protoplasm which fills the rest of the mother cell; at other times, at the under part, appears one or more clots of similar dimensions, which deviate from the centre of the conidia which form themselves successively at the underside of the first. The clot, like the central nucleole of the spore of the *Peziza*, is enclosed in a hyaline liquid containing fine granulations. This peripheric portion of the protoplasm without doubt serves to form the internal membrane of the conidia, the development of which is only sensible by the aspect of its contour being more acute than in that of the primitive cul-de-sac of the mother cell, and by the formation of a partition at the point where the conidium is separated from the mother cell; at this moment the conidium onl/ contains one refringent nucleole, at other times two, and a hyaline liquid all round. Sometimes, but exceptionally it becomes granular a little before germination. In seizing all these

periods of formation, one may presume upon the endogenous formation of the conidium, although the immediate soldering of its envelope with the membrane of the mother cell, checks the belief in a direct manner. This genesis is almost as clear as that of the chlamydospores of *Mucor;* only it is terminated, in place of operating upon the passage of a filament; it is sometimes so in the chlamydospores, and if one only had observed this last variety, I cannot say if one should have admitted without contest their endogenous formation. Nevertheless, I still leave here a point of interrogation, and I cannot give to the conidia of Fistulinas the name of chlamydospores; I have shown elsewhere that the spores called acrogenous have in reality an endosporic development, they also ought to be called chlamydospores. One has sometimes called them conidia, notably among the *Aspergilhis,* when one has discovered among them another mode of reproduction of the theca-sporic form. One sees the confusion created by this application of different names to the same bodies ; thus we prefer to see the ancient denominations prevail, and the chlamydospores of the *Mucor,* for example, called intra-mycelian conidia, until the time when one can make a rigorous classification of these different terms.

Perhaps, if we desired more exactly to characterise the conidia of the Fistulinas, their totally new angiocarpous development, the analogy of the mother cell and the basidia, of the conidia and the •spore would lead to calling them *pseudospores ;* but it appears to us that a denomination besides, which can flatter the *amour-propre* of the inventor, far from conveying precision and clearness, only causes a greater confusion in a subject already sufficiently embroiled, in completely losing sight of the general likeness of similar organs in different plants. This is my motive in preserving to the Fistulinas the name of conidia; which does not at all interfere in the exposition of the development, with the entirely special characters which they may present.

^ When the conidium is formed, it detaches itself from the conidiophore cell, which is very attenuated at the point which supports it, and it forms on the under side another conidium in the same manner, destined to detach itself in its turn ; sometimes also the second is formed before the first is detached, and it is often then deformed; this second conidium having both its extremities truncated, has moreover the form of a tipcat, or is slightly elbowed, if it is developed at a point near the bifurcation of the conidiophore cell. In any case, this basipetal development continues, may amend, one understands, little by little, the destruction of the conidiophore cell, wliich does not elongate in a measure as it gives birth to some new reproductive bodies, as is the case in *Penicillium.* Thus two consequences. On one part, the case in which we see only one conidium, carried upon a short pedicel, emerge from the cell of the parenchyma might really be the result of the successive reduction of the conidiophore cell; nevertheless, as I

have observed among the Fistulinas, I do not believe that this is always the case. Secondly, in old examples, I have encountered some gaps, in which all the conidiophore cells have been employed in the fabrication of the conidia, and one only finds it upon the borders of the conidia attached to their mother cells.

Such a phenomenon might lead one to believe in the destruc tion of the tissue of the fungus by a foreign parasite ; but, when one has gathered individuals in which the conidial de velopment has had less intensity, or is less advanced, on the con trary it is seen upon a cut, either by the naked eye, or with a lens, the perfect honiogenity of the tissue of the receptacle, to comprise the conidial zone, of which one only sees another transition of slight degradations of tints. This exterior homogenity is hardly the case, it may be granted, of the tissues invaded by a foreign parasite.[1]

In the great number of examples that I have hitherto examined I have not encountered one that did not present the conidia here described. Not only for more than ten years have I examined it every year in different parts of France, but I have examined it in the herbaria, notably in the Collection Pesmazieres (2nd ser.), mounted in 1855 • another of Maille dated 1825. I have searched in different countries; and although the *Fistulina hepatica* is neither rare in England nor in America, I have never been able to procure it in these countries. I have been in Germany. I have examined an example in the Montagne Herbarium, coming from Sikkim, in the Himalayas; this example is abundantly provided with co- nidia of similar form, having the samo similarity of position as those which the Fistulinas of France have offered me.

The germination of the conidia is difficult to obtain, and it is only after some fruitless attempts trfat I have been able to see them germinate; this result has been arrived at by conidia which were more than four years old. I have uselessly attempted some sub- stratum more allied to the natural state, like the infusions of chest- nut wood and different other liquid combinations. It is simply water very slightly sweetened that suffices for it. Some conidia, placed in this vehicle between two glasses on the 26th. April, 1870, showed me the successive phases of their germination in the latter days of May and the first days of Jane of the same year ; some days after, some foreign mycelia were insinuated by the borders of my small apparatus, and, having perpetrated to the interior, caused me to stop my observations. This is what I observed in the interval; after an absolute repose of about a month longer for a certain number of conidia which had not yet germinated on the 3rd June, the internal membrane swelled out, burst the external envelope, freeing itself from its debris by the considerable increase of its size ; it then becomes regnlarly spherical and presents a diameter of -006 mm. to -009 mm. The oily clots, one or two, which existed in the conidee before the opening of the external membrane, are always visible, and do not appear to

have augmented ; when there are two, one of them is always smaller than the other. The rest of the protoplasm is hyaline or very finely granulated; then the entire protoplasm presents a mass of greasy granulations smaller than the primitive clots which have disappeared, and the conidium gives birth to a germinative filament, more rarely at the opposed poles. Often it appears that it gives birth to a secondary conidium, the budding produced by it swells, and is slightly constricted at the point where it emerged from the mother conidium, but before it detaches itself, the spherical budding gives birth to the germinative filament. I cannot follow its length beyond *120 mm. At this moment, it has only once presented to me a partition ; the protoplasm which fills it is granular, but does not appear very rich, which may be perhaps attributed to the artificial medium in which the conidia germinated; its medium diameter is *003 mm.

[The excellent plates which accompany this work are almost necessary to understand the text; this also depends very much on the context for complete lucidity. The whole work will amply repay a careful perusal.]

SOME NEW JEBSEY FUNGI. *By* M. C. COOKE and J. B. ELLIS.

{Plate 68.)

2297. **Hypoxylon. sexpens.** Fries.—On *Acer rubrum,* Newfield,
New Jersey, as also the following are all from the same locality.

2298. **Hystexium ttloxi.** *Schwa.*—On wood of *Morus.* Apparently the species of Schweinitz.

2299. **Hystexium Viticolum.** c. <fcP.—On *Rubus.* TChis appears
to be the same species as that found in New York on *Vitis*
(fig. 9).

2300. **Peziza viiginella.** *C.* (No. 2152).—On leaves of *Vacci-*
nium.

2301. **Patellaria** atxata. *V.—Fruit not mature. On oak limbs.

2302. **Spoxidesxnium Peziza.** 0. <fc *E.—OTL* decorticated oak. Cupulaeformis, flavo-viridis, margine atris. Sporis ovatis,
oblongis, vel pyriformibus, atro-brunneis. (Fig. 5—a,

natural size; *b*, section ; c, spores.)

Resembling a minute *Peziza*, scarce 1 m.m. broad, greenish-yellow and barren in the centre, with a black margin of ovate, oblong, or pear-shaped, multicellular spores, on short articulated pedicels.

In company with the above was the following singular and interesting fungus, which clearly belongs to the Discornycetes, and is referred, wilh some hesitation, to the genus *Hcematomyces :—*

Haematomyces vinosua. C. # -E-—On decorticated oak.

Sparsus, subglobosus, demum depressus, sinuato-gyrosus, sub-cerebrinus, immarginatus, atro-vinosus; ascis late clavatis ; sporidiis biseriatis, elongato-ellipticis, multiseptatis, muriformibus, fuscis. (Fig. 10—*a,* individual magnified; *b,* section ; c, asci and sporidia.)

Not more than a line broad; when dry resembling a rugose *Patellaria,* when moist sub-tremelloid, globoso-depressed, marked with gyrose furrows, dark-vinous. Asci broadly clavate; sporidia elongated-elliptic, biseriate, multiseptate, and murifonn, brown (-045--05 x '018 m.m.)

2304. **Diplodia longispora.** C. *$ E.*—In company with an immature ***Sphceria* on decorticated oak *(Quercus coccinea).***

Sub-gregaria, semi-immersa, atra; sporis elongatis, uniseptatis, brunneis.

Perithecia rather small, and semi-immersed ; spores unusually long and narrow (-03--035 x '007 m.m.)—fig. 7.

2305. **Sphaeria botryosa.** *Fries.—On* oak wood.

2306. **Aspergillus maximus.** *Link.*—On dead twigs, running for several inches, and forming a dense brown woolly stratum.

2307. **Excipula hispidula** *(Teziza hispidula,* Schrad.)—On wood of ***Morus.***

2308. **Sphaeria (Immersae) pachyascus.** O. # *E.*—On decorticated oak.

Immersa, sparsa; peritheciis minutis, subglobosis, nigris, ostiolo brevi; ascis late clavatis; sporidiis congestis, subfusiformibus, 5-7 septatis, constrictis, rectis vel curvulis, brunneis (fig. 1).

Immersed in the wood, with the punctiform ostiola alone visible ; asci broadly clavate ; sporidia fusiform, 5-7 septate, straight, or curved, brown (-04-#045 X '008 m.m.)

2309. **Hendersonia sarmentoruxn,** var. **Rubi.** *West*—On *Rubus.*

2311. **Diatrype Duziaei.** *Mont.*—On maple twigs. Differing from

Thumen's Myc. Un. No. 275, which is not the species of Montagne or Berkeley and Curtis (fig. 8).

2312. **Diatrype Duriaei.** *Mont.*—On *Nyssa.*

2313. **Sphaeria melanotes.** *B. Sf Br.—On* oak wood.

2314. **Eutypa lata.** *Tul.*—In bad condition. On oak.

2315. **Peziza (Patellea) macrospora.** *Fell.*—On oak chips.

2316. **Lophiostoma micxostoma.** C. <fc JB.—On maple wood.

Immersa, sparsa. Peritheciis minimis, ostiolo brevi, compresso, minutis; ascis clavatis; sporidiis lanceolatis, 7-septatis, vix centro conbtrictis, brunneis*

Ostiola small, with a short compressed mouth ; sporidia lanceolate, brown, scarcely constricted in the middle, paler towards each end, central cells broadest diminishing towards the poles (-04--05 X -01 m.m.), £*g. 2*.

2317. Agyrium xufum. ***Pers,*****—On decorticated maple.**

2318. P horn a consort a. ***C.*** **<$** ***E.*****—On decorticated maple.**

Cspppitosa, atra. Peritheciis superficialibus globosis; sporis linearibus, truncatis, nucleatis (fig. 6).

Forming small tufts of 3-4 perithecia, which are small, black, smooth, and shining. Spores- linear, truncate, with a nucleus at each end, and sometimes one in the centre ("014 m.m. long).

Figures are also given on the same plate of two species of *Lophiostoma,* found in the United States. Fig. 3.—*Lophiostoma turrita,* C. & P. Fig. 4.—*Lophiostoma magnata,* C. & P.

NEW BRITISH LICHENS. *By*

THE REV. J. M. CROMBIE, F.L.S.

Since my last notice in " Grevillea," Vol. 111., pp. 190-1, the following new species, recently detected in Britain, have been recorded by Nylander in the " Flora" for 1875 :—

1. Calicium elassosporum. ***Nyl.*****—Sub similar to** ***C. brunneolum*** **(more robust), but with smaller spores and gonidia. Thallus glaucescent or glaucous-green ; gonidia conglomerated in deformed syngonidia; spores globulose, '0,0025 m.m. in diameter.**

On putrid trunks of decorticated alder. Glen Lockay, Perthshire (Crombie, August, 1875).

2. Ramalina Curnowii. ***Crovib. in litt.*****—Thallus pale-glaucous, slender, fruticulose, rounded or somewhat compressed (but with some of the lacinias broader and planer), sparingly branched and intricate, subrigid; apothecia pale, convex, geniculato-adnate ; spores ellipsoid, straight, -0,011-15 m.m. long, *0,004-6 m.m. thick.**

Thallus K x yellowish, blackish at the base ; spermogones externally black, with spermatia '0,003 m.m. long, '0,001 m.m. thick. It is$_T$ **perhaps, nearest to *It. cusjridata,* though from the spermogones it would belong to the section of *R. carpathica.***

On maritime rocks, near Penzance and the Lizard, Cornwall (W. Curnow).

3. P lac odium dissidens. ***Nyl.*****—Perhaps a subspecies of *PI, murojum,* to which it is sufficiently similar, but the laciniae are more discrete and subfree. From *PL elegans* it differs in the**

vitelline
colour of the thallus and the planer laciniae ; spores -0,009-16 m.m. long, '0,005-7 m.m. thick.

On the slate roof of houses, near Cirencester, Gloucestershire (W. Joshua).

4. Lecanora jejuna. *Nyl.*—-Thallus greyish or leaden-greyish, thin, subsmooth, at length rimose; hypothallus black, everywhere visible; apothecia testaceo-reddish, small, slightly prominent, the thalline margin thin, at length excluded ; spores 8 nse, colourless, ellipsoid, 1-septate, -0,018-23 m.m. long, -0,0p7-9 m.m. thick; paraphyses slender, epithecium yellow ; hymenial gelatine bluish, and then violet with iodine.

In the general appearance of the thallus, this species approaches to *Lecanora gibbosa* or *L. lcBvata*$_{\gamma}$ in that of the apothecia to *Lecidea coarctata;* but in reality it belongs to the section of *Lecanora disparata.* This is shown by the spermogones, which have shortly-articulated sterigmata, with the spermatia ellipsoideo-oblong, -0,002 m.m long, scarcely -0,001 m.m. thick.

On siliceous rocks. Boulay Bay, Jersey (Larbalestier).

5. Opegxapha axeniseda. *NijL*—Thallus scarcely any or obsolete ; apothecia black, linear, subgyrosely conglomerated in pulvinate, deformed acervuli; epithecium narrow; spores colourless, fusi-form, 3-5 septate, -0,014-16 m.m. long, *0,004 m.m. thick ; hypo-thecium black; hymenial gelatine, reddish wine-coloured, with iodine; spermogones congested in small black glomeruli; spermatia straight, -0,0035--0,0045 m.m. long, -0,0010 m.m. thick.

On sandy soil. St. John's, Jersey (Larbalestier).

NOTE ON « GILLET'S CHAMPIGNONS."

By PROP. FRIES.

Cel. C. GILLETII opus *Champignons qui croissent en Finance,* cujus partem priorem (p-. 1-272) nuper recepimus,vastumevadere videtur et plure continet >pecies, quain pollicetur. Nam prater species ab Auctore in Normindia tectus et plene descriptus, receptae sunt fere omnes in Epicr. 1 descriptaB. Editio vero altera Epicriseos Auctori ignota videtur, quare nonnullae species I.e. descriptse sub novis nominibus in Gilletii opere insertae. Sic e depictis.

***Amanita murina* = *Am. urceolata,* Ep. 2.**
***Lepiota Brebissoni* = *Agar. serenus,* Ep. 2.**
,, *Movieri* = *A. sistratus,* Ep. 1.
Tricholoma saevum* ex habitu, var. *Agarico personati.
TrichoL imbrioatum* melius refert, *Agaricwn furvum.
Chtocybe insignis,* optime sistit, *Agaricum Veneris.
***Lepista Alexandria Paxillus Alexandri,* ^. 2.**
***Lactarius torminosus* ad *Agaricum Cilicioideni* propius accedit.**

Prima pars continet tertiam partem Agaricinoium et 50 tabulas, in quibus plures nobiles species bene pictse. *Lepiota mastoidea* vix mea. *Lepiota granulosas* fonnse graciliores, quam vidi.

E. FRIES.

LECANORA ANGULOSA.

On perusing my notes on *Lecanora angulosa,* in " Grevillea " (p. 128), I observe that a strange mistake has been committed, which I can only account for having been overlooked, when I had the proof, by my serious attack of bronchitis and lumbago, which confined me to my bed all February. The mistake is this: the chemical reagent used was not hydrate of potash (K), but *hypo-chlorate of lime* (C). There is another error; the date of Mr. Roper's sending should be *November,* 1875.

W. A. LEIGHTON.

TRIBLIDIUM.

{Plate 67.)

The illustrations of the fruit of one species of *Ostreichnion* and nine species of *Triblidium* are given to the same scale as the figures in " Carpology of Peziza," and may be measured by the same means : —

1. **Ostreichnion Americanum.** *Buby*—from Ravenel. No. 1456.
2. **Triblidium caliciiforme.** *Reb.*—Rabh. Fungi Eur., 231.
3. **Triblidium hysterinum.** *Duf. CHyst. elevatum,* Pers.).—Mong. & Nest., 1070.
4. **Triblidium insculptum.** *Cooke.*—J. B. Ellis. No. 2111.
5. **Triblidium rufulum.** *8pr. (Trib. conftuens,* DeNot. *Hyst. rufulum,* Fries).—Ravenal.
6. **Triblidium hiascens** *{Hyst. hiascens,* B. & C.)—ex. W. It. Gerard.
7. **Triblidium Carestiae.** *C. C. (Blitrictivm Carestice).*—Erb. Critt. Ital. ii. 92.
8. **Triblidium pinicolum** *CHysterium pinicolum,* Kebent.)—Behm. Ascomy. No. 24.
9. **Triblidium minor.** *Cooke.*—ex. herb. J. B. Ellis.
10. **Triblidium Syringae** *(Hysterium Syringae,* Schwz. *TribUdiwm dealbatum,* Gerard).—ex. herb. W. R. Gerard.

M. C. COOKE.

PERONOSPORA INPESTANS.

(RESTING SPORES.)

During the past winter a warm controversy has been carried on, relative to the resting spores of the Potato Disease. Many years ago, it will be remembered, that Mons. Montagne discovered certain spherical bodies in association with the Potato fungus which he did not fully comprehend, and to these he gave the name of *Artotrogus.* Afterwards the Rev. M. J. Berkeley expressed

the opinion that these might ultimately be found to be the resting spores of the Potato *Peronospora*. Last year Mr. Worthington Smith detailed his examinations of diseased potato leaves from Chiswick, in which he found spherical bodies precisely like those described and figured by Montagne, associated with, and, as he believed, continuous with the mycelium of *Peronospora.* Other bodies were found, having apparently the function of antheridia, and these he saw applied to the surface of the globose bodies. Under these circumstances Mr. Smith considered himself justified in regarding the globose bodies not only as the *Artotrogus* of Montagne, but also as the resting spores of *Peronospora.*

Subsequently Dr. de Bary investigated the same subject, at the instigation of the Royal Agricultural Society, and published his conclusions, that the mould *(Peronospora)* possessed distinct features as regards successive production of conidia so as to merit distinction as a new genus under the name of *Phytophthora.* That the globose bodies in question did not belong to this mould, but were a species of *Pythium,* which he named *Pythium vexans,* and, that the resting spores of the potato disease had not been discovered. Here, then, he joined issue with Mr. Smith, and probably the succeeding controversy would not have brought us nearer the truth had it not been associated with new and searching examinations, which now promise to set the matter finally at rest. We cannot enter upon the details of this discussion here, but we may indicate how far the missing link is being supplied. The '* resting spores " of Mr. Smith have been placed under favourable conditions, and at once produced zoospores. This, however, was '^sufficient evidence, for *Pythium* likewise developes zoospores under similar conditions. Nevertheless, the experiments have been carried further, the zoospores have germinated, and the mode of growth, and branching of the threads, seem to be not those of a *Pythium,* but of a *Peronospora.* It may be that whilst these pages are passing through the press the evidence has been completed by the production of veritable conidia of *Peronospora* on the threads developed from zoospores of the globose bodies called " resting spores" by Mr. Smith. The presumption is now strongly in favour of Mr. W. Smith's view being indisputably established, and the controversy set at rest.

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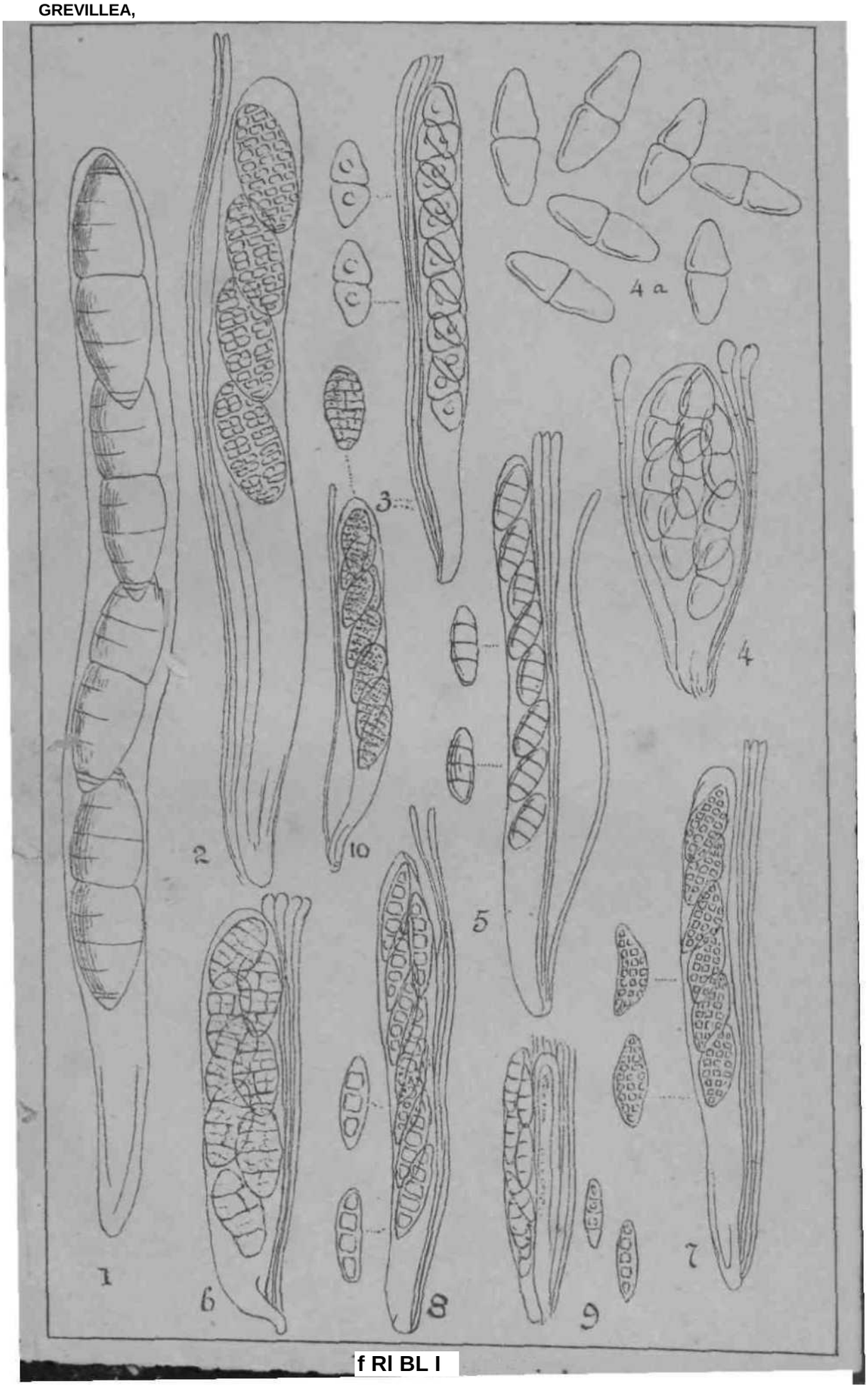

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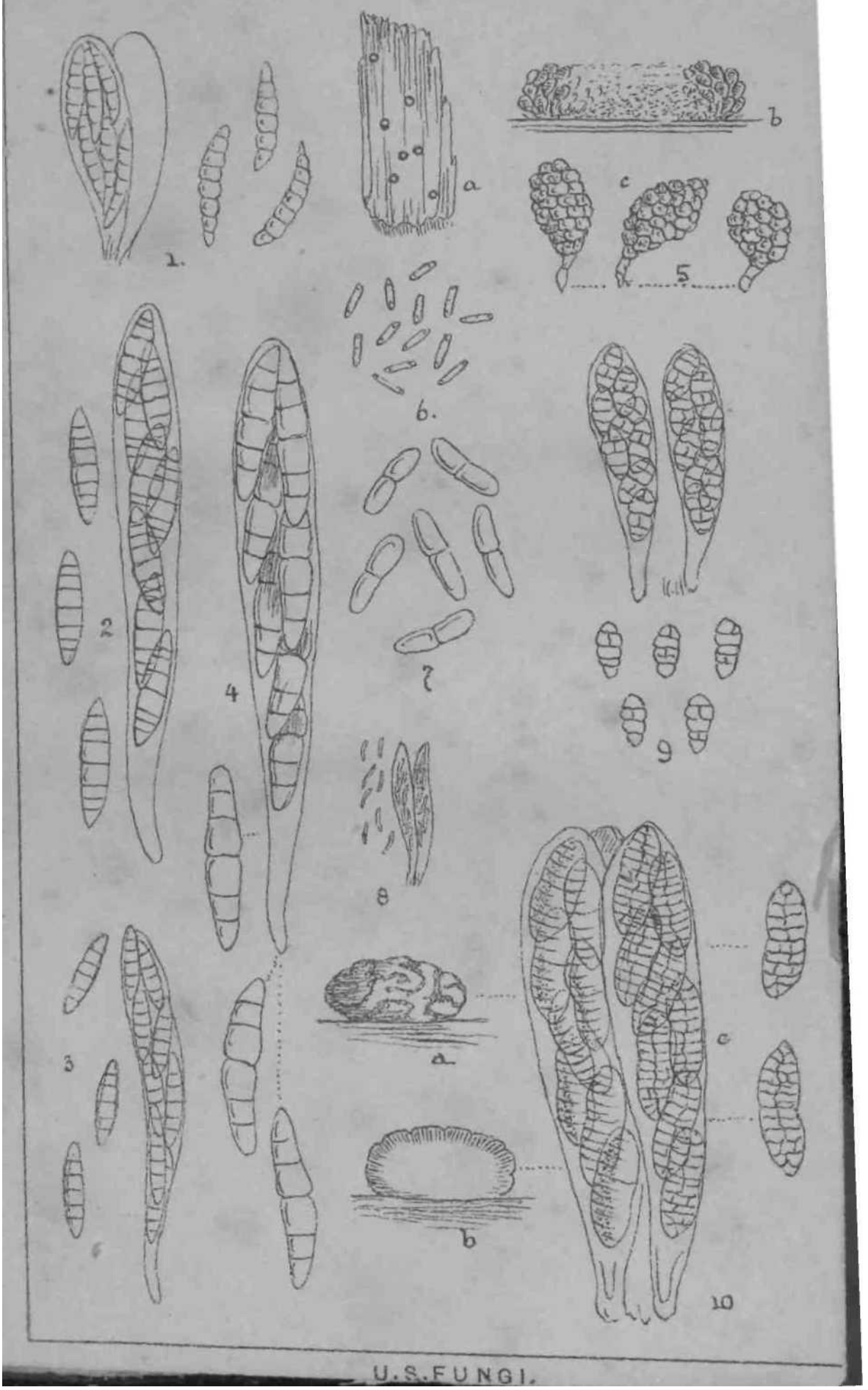

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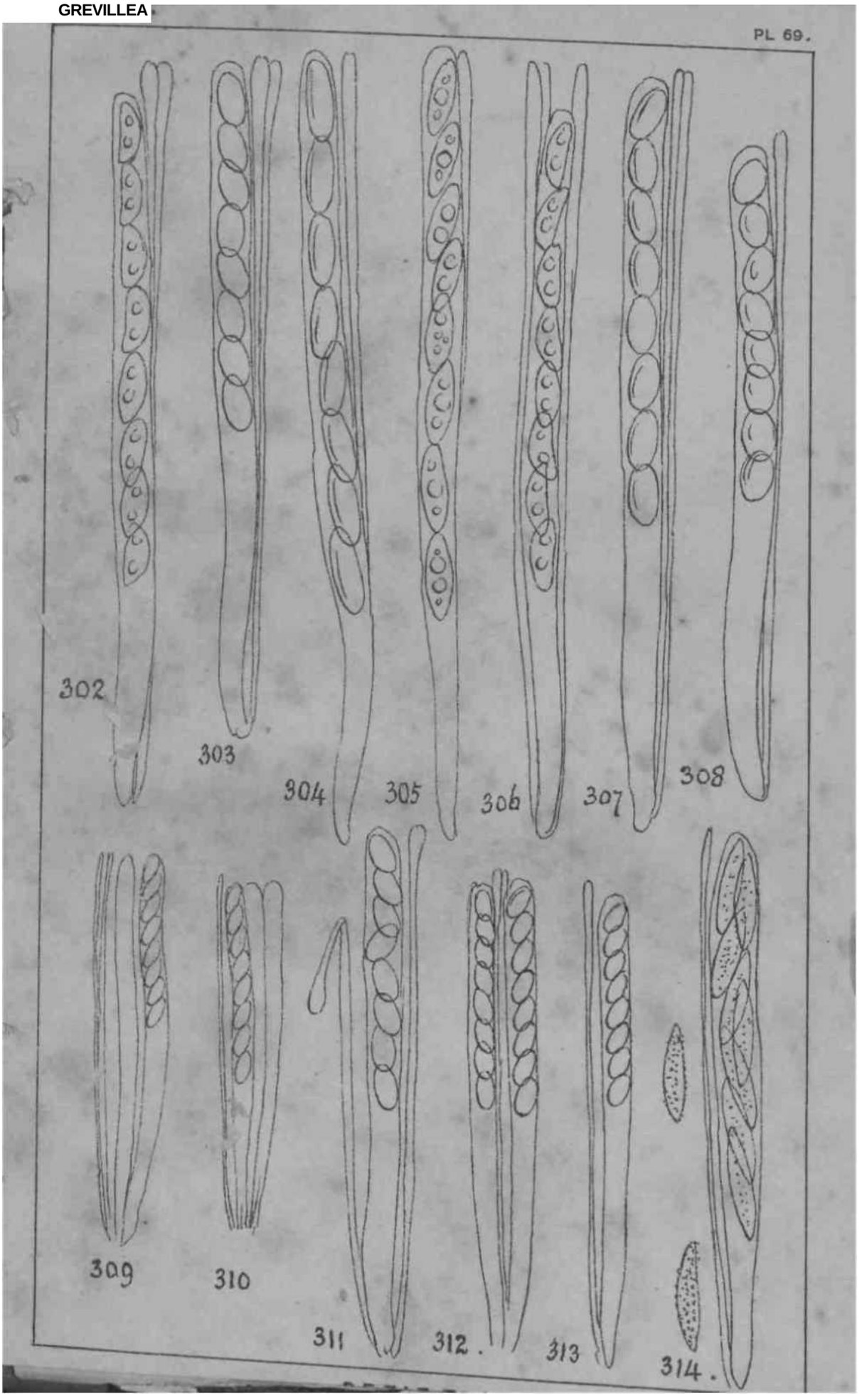
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