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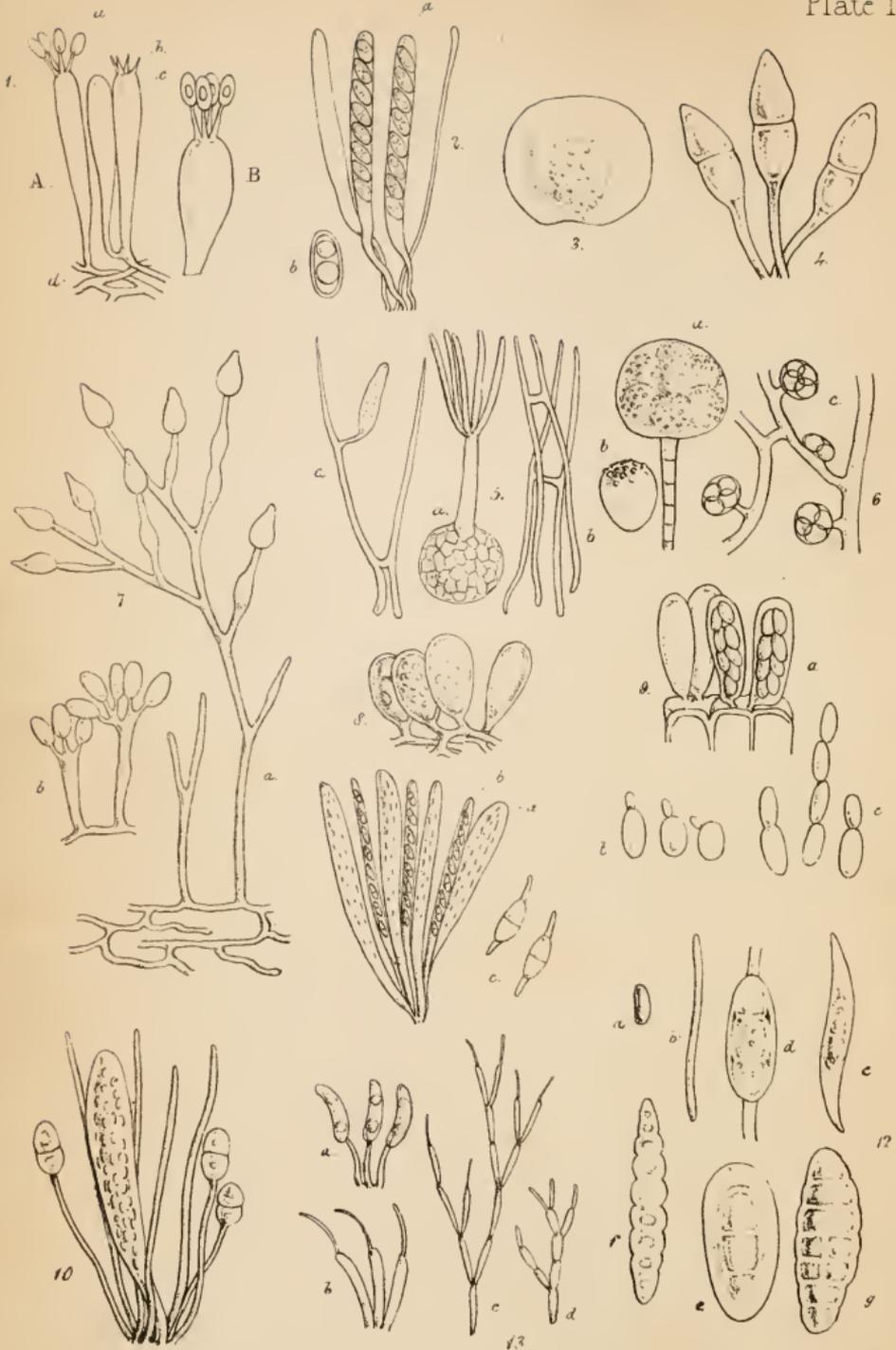




OUTLINES  
OF  
BRITISH FUNGOLOGY.







OUTLINES  
OF  
BRITISH FUNGOLOGY;

CONTAINING

CHARACTERS OF ABOVE A THOUSAND  
SPECIES OF FUNGI,

AND

A COMPLETE LIST OF ALL THAT HAVE BEEN DESCRIBED AS NATIVES OF

*The British Isles.*

BY THE

REV. M. J. BERKELEY, M.A., F.L.S.,

AUTHOR OF 'INTRODUCTION TO CRYPTOGAMIC BOTANY.'



LONDON :

LOVELL REEVE, HENRIETTA STREET, COVENT GARDEN.

1860.

“Various as beauteous, Nature, is thy face;  
    . . . . all that grows, has grace.  
All are appropriate. Bog and marsh and fen  
Are only poor to undiscerning men.  
Here may the nice and curious eye explore  
How Nature’s hand adorns the rusby moor;  
Beauties are these that from the view retire,  
But will repay th’ attention they require.”

CRABBE’S *Lovers’ Journey*.

“J’ai pensé qu’il me serait plus facile de descendre ensuite du tout à la partie, que de monter de la partie au tout. C’est un axiome algébrique qui veut que l’on procède du connu à l’inconnu, et non de l’inconnu au connu.”—*Comte de Monte Cristo*, chap. xlvii.

TO  
MRS. LLOYD WYNNE,

OF COED COCH,  
IN THE COUNTY OF DENBIGH,

*This Work is Inscribed,*

AS A SMALL TRIBUTE TO THE ZEAL WITH WHICH SHE  
HAS STUDIED THE NUMEROUS FUNGI OF  
HER BEAUTIFUL COUNTRY,  
AND IN ACKNOWLEDGMENT OF THE MANY ACTS OF KINDNESS  
WHICH SHE HAS CONFERRED UPON

THE AUTHOR.



## PREFACE.



THE object of this Work is to furnish materials for the correct determination of the larger British Fungi, and such only as require nothing more than a common lens for their examination. In consequence, all microscopic details have, as far as it was possible, been avoided, though to meet the wishes of several scientific friends, a complete list of the more minute species is appended, together with references by which the places in which those species which have been determined as British since the publication of the 'English Flora,' are recorded or described, may be readily found. A Glossary of the less familiar terms, and a list of most of the authors referred to in the descriptive part, have been added, in the hope that they may prove useful to students.

Those persons who may wish hereafter to extend their researches, will find that they have made a good beginning by the study of the larger species, the determination of which, properly conducted, will prepare them for a much more correct appreciation of the limits within which the more obscure Fungi are comprised. The contrary practice of *empirically*

*determining* the more minute species without any notion of their characters, variations, and structure, will end in nothing sound and satisfactory, while few exercises of the mental powers can be more improving than a diligent study of such a genus as *Agaricus*.

I wish it to be understood distinctly that I have not aimed at originality in defining the genera and species, but have adopted the best characters wherever I could find them, and I regret that, from an accident in transmission, I have not been able to avail myself of more than a small portion of Fries's latest work on the *Hymenomycetes*, which is unpublished.

Of the figures it will be sufficient to say that the greater part have been drawn by Mr. Fitch, whose talents as a draughtsman are too well known to require any recommendation. To Mr. Broome, who has for so many years been my fellow-labourer, I have been indebted for much assistance in the course of the work, as also to Mr. Currey. It is to their labours principally that the enormous increase in the list of Fungi since the publication of the 'English Flora' is due, amounting now to more than 2,380 species.

KING'S CLIFFE,  
August, 1860.

## EXPLANATION OF THE PLATES.



## PLATE I.

Fig. 1. *A. Agaricus grammocephalus.*

- a.* spores.
- b.* spicules or sterigmata.
- c.* sporophores or basidia.
- d.* tissue of trama.

*B. A. cretaceus.*

Fig. 2. *Peziza cupularis.*

- a.* ascus.
- b.* sporidium.

Fig. 3. *Hymenogaster tener.*

Showing spore surrounded by a sac, which sometimes contains a second spore.

Fig. 4. *Puccinia graminis.*

Fig. 5. *Tilletia Caries.*

- a.* spore sprouting, and crowned with processes.
- b.* processes anastomosing.
- c.* one of ditto, bearing secondary spores (after Tulasne).

Fig. 6. *Badhamia*.

*a.* cyst, with spores.

*b.* separate spore, to show that it is granulated where exposed, but smooth where covered.

*c.* *Enerthenema elegans*.

Fig. 7. *a.* *Peronospora infestans*, with hypha, erect threads, and spores.

*b.* *Peronospora curta*.

Fig. 8. *Gymnosporium fulvum*, *Berk. and Curt.*

Fig. 9. *a.* *Aseosporium deformans*.

*b.* sporidia simulating yeast-globules.

*c.* *A. bullatum*, to show their further growth.

Fig. 10. *Tympanis saligna*. Asci and stylospores on the same hymenium.

Fig. 11. *Nectria inaurata*.

*a.* clavate asci.

*b.* cylindrical asci.

*c.* sporidia from the latter.

Fig. 12. *a.* sporidium of *Hypoxyylon fuscum*.

*b.* sporidium of *Sphæria rubella*.

*c.* sporidium of *S. palustris*.

*d.* sporidium of *Valsa hapalocystis*.

*e.* sporidium of *Massaria fœdans*.

*f.* sporidium of *Sphæria macrotricha*.

*g.* sporidium of *Sphæria siparia*.

Fig. 13. *a.* stylospores of *Cenangium Fraxini*.

*b.* spermatia of the same. The former from the base of the pycnidium, the latter from the upper part of the walls.

*c.* spermatia of *Peziza blandula*, *Tul.*, from the hymenium (both after Tulasne).

*d.* spermatia of *Valsa hypodermia*.

## PLATE II.

1. *Merulius lacrymans*, nat. size, with a portion of the hymenium magnified.

2. *Crucibulum vulgare*, nat. size and slightly magnified, with two of the sporangia more highly magnified.
3. *Cyathus striatus*, nat. size and slightly magnified, with two of the sporangia more highly magnified.
4. *Podisoma Juniperi-Sabinæ*, nat. size.
5. *Gymnosporangium Juniperi*, nat. size.
6. *Helotium versiforme*, nat. size, with a section magnified.
7. *Tremella sarcoides*, nat. size, with a section magnified.
8. *Balanophora involucrata*, *Hook. f.*, nat. size.

## PLATE III.

1. *Agaricus phalloides*, and section, half nat. size.
2. *A. strobiliformis*, young, nat. size.
3. *A. excelsus*, and section, half nat. size.
4. *A. vaginatus*, and section, half nat. size.
5. *A. Ceciliæ*, and section, half nat. size.
6. *A. rachodes*, and section, half nat. size.
7. *A. cristatus*, and section, nat. size.

## PLATE IV.

1. *A. melleus*, and section, one-third nat. size.
2. *A. equestris*, two-thirds nat. size.
3. *A. imbricatus*, and section, half nat. size.
4. *A. sulfureus*, and section, two-thirds nat. size.
5. *A. gambosus*, and section, half nat. size.
6. *A. albus*, and section, two-thirds nat. size.
7. *A. nudus*, and section, small specimen.

## PLATE V.

1. *A. personatus*, and section, small specimen.
2. *A. infundibuliformis*, and section, small specimen.

3. *A. laccatus*, and section, nat. size.
4. *A. radicatus*, two-thirds nat. size, and section.
5. *A. fusipes*, and section, nat. size.
6. *A. stipitarius*, nat. size, with pileus and section magnified.
7. *A. dryophilus*, and section, nat. size.

## PLATE VI.

1. *A. pelianthinus*, and section, nat. size.
2. *A. galopus*, nat. size, with section magnified.
3. *A. Iris*, nat. size, with section magnified.
4. *A. vulgaris*, with section, nat. size.
5. *A. stylobates*, nat. size, with section and base of stem magnified.
6. *A. tenerrimus*, nat. size, with section and separate plant magnified.
7. *A. pterigenus*, nat. size, with two individuals and section magnified.
8. *A. pyxidatus*, nat. size, with section magnified.
9. *A. mitis*, nat. size, with section magnified.

## PLATE VII.

1. *A. bombycinus*, two-thirds nat. size, with section nat. size.
2. *A. Loveianus*, on *A. nebularis*, two-thirds nat. size, with section nat. size.
3. *A. speciosus*, two-thirds nat. size, with section nat. size.
4. *A. leoninus*, with section, nat. size.
5. *A. chrysophæus*, with section, nat. size.
6. *A. clypeatus*, one-third nat. size, improperly referred in the text to *A. rhodopolius*.
7. *A. prunulus*, with section, half nat. size.

## PLATE VIII.

1. *A. præcox*, with section, nat. size.
2. *A. adiposus*, with section, nat. size.

3. *A. mutabilis*, with section, nat. size.
4. *A. fastigiatus*, one-third nat. size, with section nat. size.
5. *A. rimosus*, two-thirds nat. size, with section nat. size.
6. *A. trechisporus*, with section, nat. size.

## PLATE IX.

1. *A. crustuliniformis*, with section, nat. size.
2. *A. longicaudus*, with section, nat. size.
3. *A. melinoides*, nat. size, with section magnified.
4. *A. semiorbicularis*, nat. size, with section magnified.
5. *A. reticulatus*, with section, nat. size.
6. *A. mollis*, with section, nat. size.
7. *A. Rubi*, nat. size, with section magnified.

## PLATE X.

1. *A. variabilis*, nat. size, with section magnified.
2. *A. campestris*, dark var., two-thirds nat. size, with section nat. size.
3. *A. campestris*, another variety, with section, nat. size.
4. *A. arvensis*, small specimen.
5. *A. cretaceus*, two-thirds nat. size, with section magnified. Variety with the stem less decidedly sunk into the pileus.
6. *A. squamosus*, two-thirds nat. size, with section nat. size.

## PLATE XI.

1. *A. fascicularis*, with section, nat. size.
2. *A. velutinus*, with section, nat. size.
- 3, 4. *A. appendiculatus*, in different conditions, nat. size, with sections slightly magnified.
5. *A. Fœniseeii*, nat. size, with section magnified.
6. *A. fimiputris*, nat. size, with section slightly magnified.
7. *A. separatus*, two-thirds nat. size, with section nat. size.

## PLATE XII.

1. *Coprinus atramentarius*, slightly reduced, with section nat. size.
2. *Bolbitius tener*, with section, nat. size.
3. *Cortinarius callochrous*, with section, half nat. size.
4. *C. anomalus*, two-thirds nat. size, with section nat. size.
5. *Paxillus involutus*, small specimen, with section.
6. *Paxillus panuoides*, nat. size.
7. *Gomphidius gracilis*, nat. size.

## PLATE XIII.

1. *Hygrophorus distans*, with section, nat. size.
2. *Lactarius insulsus*, small specimen, with section.
3. *L. piperatus*, small specimen, with section.
4. *L. scrifluus*, with section, nat. size.
5. *Russula heterophylla*, two-thirds nat. size, with section nat. size.
6. *R. virescens*, with section, two-thirds nat. size.
7. *R. nitida*, two-thirds nat. size, with section.
8. *R. alutacea*, two-thirds nat. size, with section.

## PLATE XIV.

1. *Cantharellus aurantiacus*, small specimen, with section.
2. *C. retirugus*, nat. size.
3. *Marasmius urens*, with section, nat. size.
4. *M. peronatus*, with section, small specimen.
5. *M. Oreades*, with section, nat. size.
6. *M. insititius*, nat. size, with section slightly magnified.
7. *M. rotula*, nat. size, with section magnified.
8. *M. graminum*, nat. size, with section magnified.

## PLATE XV.

1. *Hygrophorus eburneus*, with section, nat. size.
2. *Lentinus Dunalii*, with section, nat. size.

3. *Lenzites betulina*, with section, nat. size.
4. *Boletus parasiticus*, nat. size, on *Scleroderma*, not on *Elaphomyces*, as wrongly stated in the text.
5. *Boletus luridus*, with section, small specimen.
6. *B. edulis*, with section, half nat. size.

## PLATE XVI.

1. *Polyporus lentus*, with section, nat. size.
2. *P. lucidus*, nat. size.
3. *P. sulfureus*, slightly reduced.
4. *P. spumeus*, nat. size.
5. *P. ulmarius*, half nat. size, with section.
6. *P. vulgaris*, nat. size, with pores magnified.

## PLATE XVII.

1. *Fistulina hepatica*, small specimen, with tubes magnified.
2. *Hydnum repandum*, with section, nat. size, and section magnified.
3. *H. udum*, nat. size, with spines magnified.
4. *Thelephora anthocephala*, nat. size.
5. *T. mollissima*, nat. size.
6. *T. sebacea*, nat. size, with the border magnified.
7. *Stereum hirsutum*, nat. size.

## PLATE XVIII.

1. *Auricularia lobata*, nat. size, and section magnified.
2. *Clavaria amethystina*, small specimen.
3. *C. rugosa*, nat. size.
4. *C. umbrina*, nat. size.
5. *C. stricta*, nat. size, and tip of branch magnified.
6. *Bulgaria sarcoides*, nat. size, with section.
7. *Hirneola Auricula-Judæ*, nat. size, with section magnified.
8. *Dacrymyces stillatus*, nat. size, and section magnified.

## PLATE XIX.

1. *Cortinarius bolaris*, nat. size, with section.
2. *Nyctalis parasitica*, nat. size, with section.
3. *Marasmius Wynnei*, nat. size, with section.
4. *Lentinus cochleatus*, nat. size, with section.
5. *Dædalea quercina*, small specimen, with section.
6. *Craterellus cornucopioides*, nat. size.

## PLATE XX.

1. *Hydnangium carotæcolor*, nat. size, with section magnified.
2. *Hymenogaster citrinus*, nat. size, with section magnified.
3. *Phallus impudicus*, nat. size, with section.
4. *Geaster fimbriatus*, nat. size.
5. *Bovista nigrescens*, nat. size.
6. *Bovista plumbea*, nat. size, with section.
7. *Lycoperdon cælatum*, nat. size.
8. *Reticularia umbrina*, nat. size, with capillitium (*a*) magnified.

## PLATE XXI.

1. *Cyathus vernicosus*, nat. size and magnified. Two sporangia more magnified.
2. *Sphærobolus stellatus*, nat. size and magnified.
3. *Anthina flammea*, nat. size.
4. *Helvella crispa*, nat. size, with section.
5. *Morchella esculenta*, nat. size.
6. *Verpa digitaliformis*, nat. size.
7. *Spathularia flavida*, nat. size.

## PLATE XXII.

1. *Leotia lubrica*, nat. size, with section.
2. *Geoglossum hirsutum*, nat. size and magnified.

3. *G. olivaceum*, var., nat. size.
4. *Peziza badia*, nat. size.
5. *P. micropus*, nat. size.
6. *P. reticulata*, nat. size, with section.
7. *Bulgaria inquinans*, nat. size, with section.

## PLATE XXIII.

1. *Ascobolus vinosus*, nat. size and magnified.
2. *Tuber æstivum*, nat. size, and section magnified.
3. *Elaphomyces variegatus*, nat. size and magnified.
4. *Cordiceps militaris*, nat. size, with head and perithecia magnified.
5. *C. entomorrhiza*, nat. size, with sections magnified.
6. *C. alutacea*, nat. size, with section.
7. Ergot, with *C. purpurea*, nat. size and magnified.

## PLATE XXIV.

1. *Xylaria Hypoxylon*, nat. size and magnified.
2. *X. bulbosa*, nat. size and magnified.
3. *Hypoxylon ustulatum*, nat. size and magnified.
4. *H. multiforme*, nat. size and magnified.
5. *Sphæria Bombarda*, nat. size and magnified.
6. *Nectria Peziza*, nat. size and magnified.
7. *Endogone pisiformis*, nat. size and magnified.
8. *Coprinus Hendersonii*, nat. size, and section magnified.



## ADDENDA.

p. 2. Note 2. The common usage of the words *Pilz* and *Schwamm* is not without exception; *Nagel Schwämme*, for example, is the common name of *Agaricus esculentus*. See p. 118.

p. 7. The dry-rot in fir-built ships is caused by *Merulius lacrymans*, but in oak-built ships by *Polyporus hybridus*.

p. 10. Of the Orders mentioned in this page, *Phragmotrichacei* has been suppressed altogether, and *Æcidiacei* has been substituted for *Ceomacei*, as affording a more natural group.

p. 44. Much against my will, I am forced to adopt the genus *Peronospora* as limited by Caspary, not by Corda, in consequence of the double fruit so different from anything in genera allied to *Botrytis*, as far as they are at present known.

p. 59. De Bary believes that *Asterophora* is merely a conidiiferous state of *Nyctalis*; Tulasne however adheres to the older notion.

p. 72. The best remedy, perhaps, is creosote.

p. 252. After *P. Vaillantii*, insert—

77. **P. hybridus**, *B. and Br.*; white; mycelium thick, forming a dense membrane or creeping branched strings; hymenium breaking up into areæ; pores long, slender, minute.—*Boletus hybridus*, *Sow. t.* 289, 387, *f.* 6.

On oak, in ships, etc. The Dry-rot of our oak-built vessels. This species seems hitherto to have been almost neglected by authors, the latter figure only being quoted, which exhibits only a part of the characters.

p. 268. After *Thelephora byssoides*, insert—

13\*. **T. sebacea**, *Fr.*; effused, between fleshy and waxy, incrusting, at length hard, various, tuberculated, or resembling stalactites, dirty-white; circumference fringed. (Plate 17, fig. 6.)

On grass, etc. Common.

p. 309. After *Cribraria intermedia*, insert—

2. **C. intricata**, *Schrad.* On decayed fir-stumps. Weybridge, *F. Currey*. July, 1860.

p. 368. I believe *Peziza Godroniana*, *Mont.*, is not distinct from *P. tricolor*, *Sow.*

p. 372. After *Helotium ochraceum*, insert—

21\*. **H. imberbe**, *Fr.* On decorticated willow, *A. Jerdon*. Mossburnford, 1860.

## CORRIGENDA.

p. 13. For *Hymenangium* read *Hymenogaster*.

p. 81. For *Polyporus iguivarius* read *P. fomentarius*.

p. 87. For 13 read 10.

p. 91. For Plate 1 read Plate 3.

p. 231. For *Elaphomyces* read *Scleroderma*.



OUTLINES  
OF  
BRITISH FUNGOLGY.

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Introductory Matter.

CHAPTER I.

PRELIMINARY OBSERVATIONS.

EVERY one is more or less acquainted with the soft, fugitive, variously coloured, succulent plants, which abound everywhere in our woods and meadows, and which are known under the common names of Toadstools, Mushrooms, or Champignons, according as they are objects of disgust or admiration, from their real or supposed poisonous or nutritious qualities. While therefore the former are, in general, kicked on one side, or trodden down, the latter, in proportion to the degree of knowledge possessed, are carefully gathered and turned to use. There is, however, no general word in our language which will comprehend even the whole of this group, much less the vast tribe of plants which are classed with them in every Natural botanical arrangement. Popular knowledge, indeed, goes sometimes far enough to associate with them some of the Fungi which grow on the trunks of trees, as the nearly smooth *Polyporus* of the birch, and the scaly species of

the ash and walnut, which are commonly called Sapballs, or the hard corky kinds, one of which supplies the Amadou of commerce; but there is no general conception that the multitudes of parasites which grow on dead and living plants, frequently inducing disease or decay, the mould which runs over our fruit and provisions, or the yeast of beer and mother of vinegar, are closely allied productions; if, indeed, the very existence of some amongst them is recognized at all. We are obliged, therefore, to have recourse to the Latin language for a general word to comprehend the whole tribe, which is denominated *Fungi*. An objection, indeed, has been raised to the term Fungology, which indicates a knowledge of the whole tribe, as composed at the same time of a Greek and Latin word. The word is however like many other spurious words very generally received; and if the objection should be considered insuperable, we have but to substitute that of Mycology, which is at once correct in etymology and comprehensive enough to include all we wish. The word Fungus may however in any case be retained as expressing these plants in common parlance, only we must take care, if we do not use the more English-looking word Fungal, not to speak, as is too frequently the case, of a Fungi,\* which is at once grating to the ear, and utterly intolerable. If Fungus be considered as an English word, as it is used indeed by some of our older authors, the plural will be Funguses; but there is then something unpleasing in the sound, and the term Fungi is certainly to be preferred.†

\* As, for example, in Phillips's Prize Essay on the Potato Murrain, Journ. of Royal Agricultural Society, vol. vii. p. 309.

† The French word *Champignon* was originally scarcely of wider signification than our word Mushroom, though now classical in the sense of Fungi generally. The German word *Pilz* (a corruption of *Boletus*) is used to denote the softer kinds, while *Schwamm* generally denotes such Fungi as *Polypori*.

What then, generally speaking, are the plants comprehended under this denomination? Now it is very difficult to give a strict definition which will comprise every individual genus and species of the whole group. It would lead me into discussions far too deep at present, to enter into the reasons of this difficulty; nor could they be understood without some previous knowledge of the neighbouring tribes of Lichens and Algæ, which I am not at liberty to assume,\* or indeed of the intimate relations which exist generally between contiguous groups of organized beings, insomuch that it is often extremely difficult to distinguish even a plant from an animal. It is principally amongst microscopical objects that such perplexities occur, though a few cases of difficulty arise where the true position of a plant cannot at once be obtained from the mere habit, without attention to the nature of the fruit.†

Without any strict definition then at present, I shall proceed to call attention to a few of the various plants comprised in the study of Mycology, from which something like a general notion of the subject-matter may be gathered.

If we take the common Mushroom (Plate 10, fig. 2) as our point of departure, we have the type of an enormous group, characterized by a hat or bonnet-shaped receptacle (*pileus*), supported by a stem, and furnished beneath with a number of gill-like plates (*lamellæ*), which deposit, when placed on paper, a vast quantity of dust-like bodies, to which, though reproductive, the name of Spores (Plate 1, fig. 1. *a.*) has been given, to distinguish them from seeds which contain an embryo, while these consist of a two-coated cell, without the slightest trace of an embryo. These spores are of different colours in

\* The whole question is discussed in Berkeley's 'Introduction to Cryptogamic Botany.'

† As in the gelatinous matter so common on gravel walks after rain, called *Nostoc*, which has the habit at once of a Lichen, Alga, or Fungus.

different species, very frequently pure-white, but presenting also pink, various tints of brown, from yellowish and rufous to dark-bistre, purple-black, and finally black.

As these colours are accompanied by peculiar differences of habit, they afford a ready test for grouping the species. The greater part of these plants are of rapid growth, and of a soft, cellular substance. They differ greatly in stature, colour, and outward appearance; some are perfectly smooth, others densely slimy, while many are clothed with silky or downy hairs and bristles, disposed in various ways, and adding greatly to their beauty. Some species have the brightest colours of the rainbow, combined with the most elegant form and delicacy, while others are coarse, dull in colour, and unsightly; few are at all persistent, and many when decayed pass into a loathsome, offensive mass. A particular group, common in hotbeds, is known by the whole pileus, almost before expansion, dissolving into an ink-like fluid. The greater part of these plants spring at once from the ground or other matrix without any general covering; but in a few of the more highly organized, there is a general wrapper (*volva*), (Plate 3, fig. 4,) which encloses the whole plant, bursting and leaving more or less evident traces behind; while in others the pileus is at first clothed with fibres of greater or less delicacy, which either vanish entirely as it expands, or leave traces behind upon the disc, or at the margin, in which latter case it is called a veil (*cortina*), (Plate 12, fig. 4). Sometimes a membrane is attached to the stem, either connected immediately with the volva, or at first spread under the gills, which when more or less persistent is called a ring (*annulus*), (Plate 3, fig. 6, 7).

The stem, though very frequently present, does not exist universally. It first becomes short and excentric, and then, from being strictly lateral, vanishes altogether, so that the

pileus presents various forms, as fan-shaped, kidney-shaped, semiorbicular (*dimidiate*), and occasionally becomes attached by the surface of the pileus; so that the gills are superior instead of inferior, and the pileus is then said to be *resupinate* (Plate 10, fig. 1).

The Gill-bearing Fungi are generally of a soft substance, but they are not all so. According to the density with which the cells or threads of which they are composed are packed, they present various degrees of hardness, till they assume even a corky substance, and are more or less persistent. The common fairy ring Champignon, *Marasmius Oreades* (Plate 14, fig. 5), is a familiar example of the first departure from the common Mushroom type, and in consequence of its less watery character, it is easily preserved in a dry state for culinary purposes. The Dædalea of the birch, *Lenzites betulina* (Plate 15, fig. 3), a widely distributed species, gives a good example of a still further hardening of the gills, while in that of the oak, *Dædalea quercina* (Plate 19, fig. 5), the substance is as firm as cork, or, in parts, as hard as wood.

There are a few Fungi in which the gills assume the form of folds or veins, departing thus from the more common type. The Chantarelle, for instance, *Cantharellus cibarius*, which is such an ornament of our woods from its bright melon-like colour and grateful odour, is a good example. The folds in some species pass into mere veins, and in the very lowest the fruit-bearing surface (*hymenium*) is all but even, thus paving the way to a group which we shall have to speak of presently.

In a few species there is a gelatinous stratum either external to the pileus or inserted in the midst of the general mass of its tissue; but in general this element, which is so important in one group, is but slightly developed, and never constitutes the whole or major part of the tissue.

In some of the species of Gill-bearing Fungi, especially where the substance becomes tough and hard, there is a tendency in the gills to run into each other by means of lateral processes or veins, and so to make pores. The Fungi of this first division are known under the general name of *Agaricini*, or Mushroom-like Fungi. Almost all the species are of considerable dimensions; a very few only, as the pretty holly-leaf Agaric, with its long bright bristles, require a common lens to see their beauty.

In a very important group of Fungi, however, the pores are the essential character, as the gills are in those we have just described. These pores may be partially or entirely free, as in the genus\* *Fistulina* (Plate 17, fig. 1), with which most are familiar under the form of the dark-red Fungus which is so common on the trunks of old oaks, and which when divided looks very like beet-root, the whole plant resembling an ox-tongue. In general however they are closely packed and more or less intimately united, sometimes separating easily from each other, and sometimes inseparable. The former condition occurs in the most characteristic genus of the group, *Boletus* (Plate 15, fig. 4, 5, 6), which under a variety of forms adorns our woods or the scanty herbage under old trees, more rarely appearing on hedgesides, or in the open fields. Under fir-trees a bright-yellow species is extremely common, and one of a more sombre tint where larch is predominant. Sometimes they grow in conspicuous rings, and sometimes they attract notice from the instantaneous change which they undergo, when broken and divided, from white or yellow to deep blue. This change was long a source of perplexity to those who examined it, but it is now known to depend upon the action of ozone upon the juices.

\* This genus is indeed sometimes associated, but wrongly, with the genera of the next division.

All the true species of *Boletus* are fleshy, but they are closely connected with one of the largest genera of Fungi, the *Polypori* (Plate 16, fig. 1-6), which exhibit every gradation, from great succulence to the hardness of wood, in their multitudinous species. The scaly Polyporus (*P. squamosus*), so common on ash; the hispid, ferruginous *P. hispidus*, which abounds on apple-trees; the coriaceous *P. versicolor*, with its velvety pileus and many-coloured zones, so common on stumps and felled wood; and the hard, hoof-shaped *P. igniarius*, to be found everywhere in plum-orchards,—are examples of different conditions familiar to us all. Multitudes of other forms occur, distinguished by the presence or absence of a stem, the complete attachment of the pileus to the substance on which it grows, so that the whole plant consists of resupinate pores, by the clothing of the pileus, by the nature of the pores, etc. Many of these are extremely common, and others as rare, and some run so closely into each other that the species are very difficult to distinguish. In a few foreign species the pores are so large that they very closely resemble a honeycomb, and in others, almost the whole plant is of a gelatinous texture. Such also is the case in a rare British species of the genus *Merulius*, which contains the well-known Dry-rot, *Merulius lacrymans* (Plate 2, fig. 1), so destructive to our ships and domestic buildings. The walls of the pores are here mere veins, and there is a close connection with some of the lower forms of the Gill-bearing Fungi. The Pore-bearing Fungi are included under the common name of *Polyporei*.

Occasionally the walls of the tubes or pores are broken up; and as this takes place in an early stage of growth, the whole surface of these processes is covered with the fructifying cells, or, in other words, with the hymenium.

This paves the way to a third group of some importance,

which may not however be so familiar to many of my readers as the two former. The existence of prickles, or spine-like processes, on the under surface of the pileus in the more typical genera and species, is the characteristic mark, as gills and tubes were of the two former. The pretty *Hydnum auriscalpium*, which is common upon fir-cones, will have attracted the notice of many from the elegance of its form and colouring; and the esculent *H. repandum* (Plate 17, fig. 2), which is a common inhabitant of our woods, must be known to every one who has observed the differences which exist among these plants. There are, however, abundant species which will reward a closer research by their own peculiar beauties. One or two are gelatinous, and a few acquire considerable firmness of texture. Some consist almost entirely of spines, with scarcely any pileus, while others are as regular in form as a Mushroom. A few are repeatedly branched, resembling a cauliflower. In one genus, *Hericium*, which may perhaps reward future researches in this country, the spines are extremely large and perfectly erect, and have the appearance of ivory. The Fungi of this third subdivision are called *Hydnei*, after the typical genus *Hydnum*.

We noticed before, that in the lower Gill-bearing Fungi, the hymenium is sometimes almost destitute of folds, thus preparing the way for an important group in which the characteristic point is the absence of projections or depressions on the hymenium. The species are often very common and widely diffused. An oak-trunk, when felled and decorticated, is soon covered with a bright-yellowish, velvety Fungus, with a smooth hymenium of the same colour, *Stereum hirsutum* (Plate 17, fig. 7), while a felled poplar, left, as is usual, with the bark on, is in like manner adorned with a beautiful and somewhat similar lilac Fungus, *Stereum purpureum*. They

are scarcely ever fleshy, but for the most part coriaceous, with an admixture of waxy, membranous, or gelatinous species. As in the former instances, many are resupinate; but in general, the stem is less common than in the other groups, and when present, not very distinct from the pileus, but confluent with it. In the genus *Thelephora* (Plate 17, fig. 4, 5, 6) there are slight traces of folds, and in a few species of *Stereum* there are bristles or bristle-shaped processes, which on a careless view might confound them with the species of the Tooth-bearing Fungi. They vary extremely in colour, and sometimes assume the brightest blue, the most brilliant vermilion, and other vivid tints. The group is called *Auricularini*, from some of the most characteristic being ear-shaped.

We have hitherto seen, at least in the higher forms, something like a pileus, which indeed may gradually be attached by its upper surface, so as to present to the eye nothing more than the hymenium. There is however a group in which the pileus vanishes altogether, so that the club-shaped receptacle is covered with the fructifying surface. If the stem is branched, we may have every variety of tree-like form. The yellow *Clavaria fastigiata* of our meadows, or the white, candle-like bundles, *Clavaria vermiculata*, so common on our lawns in autumn, are examples familiar to every observer of Nature. (See Plate 18, fig. 2, 3, 4, 5.) In the one case, each plant is simple; in the other, the whole presents a strongly branched and closely packed mass. Here, again, we have the most beautiful colouring, though several of the finest European species have not yet been noticed in our woods. One or two common species occur on sticks or fallen trunks, which are decidedly gelatinous in point of texture and consistence. These Fungi are named *Clavati*, from their club-like form.

There yet remains another group of allied Fungi, distin-

guished by the predominance of the gelatinous element. Rotten sticks in our hedges or woods often present bright, tremulous, gelatinous masses of bright-orange, purple, or dark-brown, which at once attract our notice, while the trunks of the elder and some other trees afford ear-shaped, flaccid masses, which almost escape notice when dry, but with the first shower are exposed to the most careless observer. Sometimes, again, on an old stump, or at the base of a living oak, enormous masses are found resembling the convolute intestines of some animal, but distinguished by their rich ferruginous or yellowish tints. These Fungi are very curious in point of structure, but at present I am only endeavouring to give a general view of the different objects which form the immediate study of the Fungologist. The Fungi of this group are called *Tremellini*, from their soft, flaccid character. (See Plate 18, fig. 6, 7, 8.)

These six groups form subdivisions of one great association of Fungi, characterized by their hymenium being more or less exposed, and at the same time bearing naked Spores attached to the tips of certain cells called Sporophores (Plate 1, fig. 1. *c.*), and distinguished from other Fungi with an exposed hymenium in which the reproductive bodies are contained in sacs called *asci*, and have the name of Sporidia (Plate 1, fig. 2. *a. b.*). These distinctions can be ascertained only by the microscope; but a very little practice will at once decide which structure prevails in the larger and more conspicuous species. The general name of the division is *Hymenomycetes*, the hymenium being the prominent character.

The hymenium, or fructifying surface, has hitherto been more or less exposed. It may indeed at first be concealed, but ultimately it has free access to the air, though, except in the lower species, not to the light. The second main division of Fungi has, on the contrary, the fructifying surface con-

cealed, till the sac in which it is contained is ruptured for the dispersion of the spores. This division has received the common name of *Gasteromycetes*. The Puff-balls are the most generally known example. Some of the most curious and typical genera in this division do not occur in this country.

Very few of my readers will probably have observed the underground species which constitute the first British group of this second division. They abound however in many parts of England, and may be detected like little tubers by simply raking the surface. One of the largest, *Melanogaster Broomeianus* is commonly sold as a substitute for Truffles in the market at Bath, and may be familiar to some. They differ, however, materially in structure from real Truffles, as will be seen hereafter. If the stem of a *Boletus* were removed, and the pileus contracted into a ball, so as to conceal the hymenium entirely, we should have a tolerable representation of one of one of these tubers, especially if the tubes should become complicated and sinuous and constantly cross one another. Indeed, so much is this the case, that the beautiful orange-coloured species, *Hydnangium carotacolor*, was first taken for a diseased *Boletus*, and on the contrary, a badly dried diseased *Boletus* has been inserted in my own herbarium as an *Hydnangium*.\* This first group is called *Hypogæi*, from the subterraneous growth of the species which it comprises.

A very curious group of Fungi is closely connected with these, though the similarity is visible only in a young state; I mean the *Phalli* (Plate 20, fig. 3). We have but few species in this country: but one is the pest of pleasure-grounds, as at Kew, from its odious smell. In a young state they resemble eggs. The pileus (if it may so be called) is closely

\* We have no British representative of the *Podaxinei*, which resemble in many respects Boleti and Agarics.

confined within a thick volva, the inner substance of which is gelatinous, and in this state a distinct hymenium is visible, constructed as in the preceding group. Soon however the volva bursts, and the hymenium dissolves into a loathsome, fetid mass, which is eagerly devoured by flies. *Clathrus cancellatus*, one of the most beautiful of Fungi, has been detected in the south of England and Ireland. Its beauty however scarcely compensates for its detestable smell. Some of the foreign species of this group when fresh are exquisitely beautiful, but all, I believe, partake more or less of the disgusting odour. These Fungi are called collectively *Phalloidei*, from the typical genus *Phallus*.

Every one is acquainted with the Puff-balls, which by means of the curious but very rare genus *Batarrea*, are connected with the *Phalli*. When young their hymenium resembles the crumb of bread; but they soon lose their primitive condition, and pass from a cellular to a semi-liquid state, and then to the dusty condition which is known to every child. The common Puff-balls are occasionally interesting objects, from the beautiful warts or prickles with which they are adorned, but they are far exceeded in interest by the starry Puff-balls, *Geaster* (Plate 20, fig. 4), which from their comparative rarity are little known to general observers. They however sometimes occur in considerable abundance, and never fail to excite the admiration of all lovers of beautiful forms. There is another genus, *Scleroderma* (Plate 15, fig. 4), which can scarcely have failed to attract notice from the frequency of one onion-shaped species on lawns. The species are darker in colour than the Puff-balls, and differ in their thicker, more persistent coat (*peridium*), and compact mass of spores. The subdivision is named *Trichogastres*, from the hairs or threads which in most cases accompany the spores.

The Puff-balls, it was remarked, were in their first condition cellular, though so dusty when mature. A large group of Fungi, containing multitudes of the most exquisite microscopic objects, is distinguished by the early condition being creamy, or mucilaginous. They differ in many respects from other Fungi, and especially because they seem often quite independent of the substance on which they are developed. One species, for instance, was discovered by Schweinitz, in America, growing on iron which had been red-hot only a few hours before. I can myself answer for the true nature of the production, as I possess a portion of the original specimen. I have seen specimens again of another species, growing on a leaden cistern at Kew, from which it could derive no nutriment. Another was found by Sowerby, on cinders, on the outside of the dome of St. Paul's. In consequence of this and of some peculiarities in the substance of which they are formed, resembling that of which certain Infusoria are composed, a very excellent observer, Dr. de Bary, has lately expressed a formal opinion that they are animals; but a sufficient answer to this is the fact that some of the species contain spiral vessels, and have their spores surrounded by a distinct sac, exactly as in an abnormal condition of *Hymenangium* (Plate 1, fig. 3, 6). The most familiar example is that of the yellow, frothy, and ultimately dusty substance which is so common on the tan of stoves, and which is the plague of cultivators. Some species of *Reticularia* also are so large as to attract notice, especially *R. maxima*, which sometimes runs over cucumber-beds, overwhelming everything in its path, and choking the plants. *Spumaria mucilago* is another conspicuous Fungus of the group, which is far from uncommon on the stems of grasses. Most however of the species are too small to attract general notice, though from the elegance of their form and brilliancy

of colouring they occasionally command attention, notwithstanding their diminutive size. The species are called *Myxogastres*, from their early mucilaginous condition.

There yet remains another very singular and distinct group of closely allied Fungi, which contains but a few British species. These however are so curious or beautiful, that they never fail to command admiration. One of them, *Cyathus vericosus*, is common in turnip-fields or amongst stubble, resembling little cup-shaped sacs, full of eggs; and two others are by no means rare, on dead fern-stems, sticks, etc. A smaller Fungus, *Sphærobohus stellatus* (Plate 21, fig. 2), is remarkable for its expanding like a little star, and shooting out with prodigious force by the inversion of its inner membrane, a globose mass, which contains the fruit, just like a shell from a mortar. These Fungi are known under the common name of *Nidulariei*, from the nest-like appearance of the more typical species. (See Plate 21, fig. 1, and Plate 2, fig. 2, 3.)

We now come to a large division of Fungi, of which little is known to the general observer, because almost all its species are so small, and in general so devoid of external beauty, that it is only the lover of the microscope who is at pains to study them. A large portion of them are to the naked eye mere black specks upon leaves, twigs, etc., though the structure of their spores is often very curious. Many, it is believed, are nothing more than conditions of some of the Fungi which are comprised in the fifth great division of these plants. Some of them have their spores contained in a distinctly organized cyst (*perithecium*);\* others are merely concealed under the bark or cuticle, while others are completely exposed. In the former

\* The word *perithecium* more properly applies, according to its etymology, to the *Sphæriacei* and their close allies, but it would be refining needlessly to give the organ a distinct name here.

case the spores are usually simple, in the latter they are often arranged in necklace-like threads of greater or less tenacity. The general name of the division is *Coniomycetes*, from the dust-like nature of the spores. The four first groups are known under the names of *Sphaeronemei*, *Melanconiei*, *Phragmotrichacei*, and *Torulacei*, the characters of which will be given in the systematic portion of the work. I can point out no popular representatives of these subdivisions. My more immediate object is simply to give some general notion of the plants comprised in the term Fungi, avoiding as much as possible all microscopic characters.

There is still another important group, consisting of two divisions, *Pucciniæi* and *Cæomacei*, of which a few species have been long observed, though their real nature is often mistaken,—I mean the Rust, Smut, and Mildew so prevalent and injurious to our corn-crops, besides a host of species which infest other plants while still in a living state. In two genera of this group the parasites obtain such large dimensions, and are of so bright a colour, that they can scarcely escape notice where they abound. To this are referable the jelly-like masses on the different species of Juniper (Tab. 2, fig. 4, 5), which not only resemble the gelatinous *Tremellæ* in outward aspect, but in some points of structure, proving clearly the connection of the whole group of parasites with the higher Fungi, and stultifying the views of those who regard these productions as mere states of the cellular tissue of the plants on which they are developed. Of these Fungi there are two groups. The *Pucciniæi*, to which the Wheat Mildew belongs, distinguished by their articulate spores (Plate 1, fig. 4), and *Cæomacei*, containing the Bunt, Rust, and other simple-spored, truly parasitic, dust-like Fungi (Plate 1, fig. 5).

Every one is acquainted with the large division of Fungi

which follows, consisting of those Moulds which bear naked fruit, and are known under the name of *Hyphomycetes*, from their filamentous character. The Blue-mould of cheese and paste, and the common species which run over preserves and other stores are familiar examples. Some are so bright in colour and form such compact masses that they readily attract notice; but there are few, if any, which do not require the use of the microscope, even for the accurate examination of their outward forms. Some of these Moulds, again, are mere conditions of other Fungi. Though difficult of examination, they amply repay investigation. They are divided into five groups, *Isariei*, *Stilbacei*, *Dematiei*, *Mucedines*, and *Sepedoni*, of which it is not easy to give popular examples. The first two contain species in which the threads of which the plants are composed are closely compacted, so as in some cases to make them resemble the Clavate Fungi mentioned above (p. 9). The red Fungus, so common in gardens on dead currant-branches, forming little scarlet, cushion-like masses, is a good example of the second.\* The species of the third division consist of loose threads, which are mostly dark, as if carbonized; while the white or purer coloured Moulds constitute the fourth. The typical genus of the last subdivision, *Sepedonium*, is familiar to many, from its transforming the *Boleti* of our woods into a bright-yellow spongy mass.

This terminates the first series of Fungi, consisting of four divisions, in which the fructifying bodies are naked and exposed. There are, however, other plants included in the term, which differ greatly in structure, but many of which are readily recognized by the common observer as true Fungi, while others are as minute and obscure as the black specks noticed before. At present we are looking principally to outward characters. It

\* This, however, is probably merely a state of *Nectria cinnabarina*.

is necessary however to remark, that these productions, instead of naked spores, have fructifying bodies (*sporidia*) enclosed in sacs (*asci* or *sporangia*). (Plate 1, fig. 2.)

In those Fungi of the second series which have asci, the receptacle which bears the fructifying stratum, whether exposed or concealed from view, is more or less complicated in structure, while in those which have sporangia, it is loosely filamentous, as in *Mucedines*. In a few instances however the sporangia themselves are cellular; but in such cases the true nature of the productions is often somewhat doubtful. On these grounds we have two primary divisions,—*Ascomycetes* and *Physomycetes*, whose names are indicative of their distinct characters of ascus-bearing and sporangium-bearing Fungi.

The first group, of *Ascomycetes*, which meets us, is that which is best known, as it includes such productions as the Morel, and the large *Pezizæ* (Plate 22, fig. 4, 5, 6), or cup-shaped Fungi, which attract admiration from their form and colours. The scarlet *Peziza*, common in some districts on sticks, the orange *Peziza* of wood, the vesicular *Peziza* of hot-beds, are all well-known examples, and there are many others of variable size and beauty which will reward researches in our woods. One of the most curious, *Peziza venosa* (Plate 22, fig. 6), is a common inhabitant of the naked soil in woods or gardens in spring, some inches in breadth, and remarkable for its wrinkled hymenium and nitrous odour. The leading species of the group are mitre-shaped or club-shaped; but the hymenium, and the receptacle on which it is spread, by various gradations, at length form a perfect cup, which in the higher species is borne upon a stem, but in others is perfectly sessile or expanded, in which case it resembles closely those Fungi of the Gill-bearing division, which present a smooth, even hymenium (*Auricularini*). These Fungi are called collec-

tively *Elvellacei*, from the typical genus *Helvella* (Plate 21, fig. 4).

A few of the *Pezizæ* are subterranean in their habits, and thus pave the way for the Truffles (*Tuberacei*) (Plate 23, fig. 2), which grow completely beneath the surface, answering to *Hypogæi*, p. 11, and which are well-known objects of commerce. These vary greatly in structure and in the nature of their fruit. The more common have a rough corrugated surface, like the fruit of a Pine-apple, but others are perfectly even.

To these succeed a host of hard or coriaceous species, of which scarcely any attract general notice. One of the most conspicuous is the round, black Fungus (*Rhytisma acerinum*), so common on the leaves of different species of maples. The group is distinguished by the common name of *Phacidiacei*, from the genus *Phacidium*, of which a pretty species grows on dead oak and beech leaves.

These are followed by an enormous mass of plants, specimens of which occur on almost every stick or stalk which we can pick up in our hedges, woods, or gardens. Some of the finest occur on insects. Those of our own country are in general but little known; but there are few of my readers who have not seen the Caterpillar Fungus of New Zealand, which is one of the finest in the section. One of the commonest examples is afforded by the old *Sphæria Hypoxylon*, which grows at the base of stakes, gate-posts, etc., looking like the snuff of a candle. We have one or two larger species, but not so generally known. Some recommend themselves to notice by their colour, as *Nectria cinnabarrina*, which is so common on old sticks in gardens; but the attraction of many consists entirely in the structure of their fruit. The exotic species, which are very abundant, are often remarkable for beauty and singularity. These Fungi are called *Sphæriacei*. The club-shaped

species are distinguished from *Clavaria* by their having their fruit contained in *perithecia*, which are very conspicuous beneath the cuticle when the plant is divided.

A very distinct division contains some of the productions which are commonly known under the name of Mildew. These in a young state are white and mealy, and are known as Hop Mildew, Rose Mildew, etc.; but as they grow, they form first yellow, then black, speck-like sacs, which contain a different form of fruit. These sacs are attached to abundant filaments, and therefore approach somewhat in appearance to Moulds. They are called *Perisporiacei*, from the typical genus *Perisporium*.

There is yet another small group, of which one genus consists of Fungi which grow principally on animal substances, as decaying hoofs, horns, feathers, etc. These, however, are not very common, and are therefore little known. The group is called *Onygenei*, a name alluding to the growth of one of the species on hoofs of animals.

We have still another set of productions which rank amongst Fungi, some of which are popularly known. They are the Sporangium-bearing Fungi noticed above, p. 17. They consist of two groups only, the first of which comprises the dark felt-like Fungi, which run over the leaves of living trees. They are uncommon in Great Britain, and it is probable that they are, in general, conditions of other Fungi. They are called *Antennariæ*, from the threads of some of them when magnified resembling the antennæ of beetles. The other contains those Moulds which have distinct sacs on their threads, and not naked spores. The common Moulds of paste and of rotting pears are well-known instances. The finest British example is *Mucor nitens*, which grows on fatty substances, and attains a considerable size. Most of the species, however, are merely microscopic objects.

Such, on a general review, are the objects which engage the study of the Fungologist. He will not at first, perhaps, be able in every case to assert at once, without danger of mistake, that any given production is a Fungus, because some of the Lichens, or even Algæ, come so near to Fungi. But this is true only of a limited number of plants which will not naturally come under his investigation at first. There are multitudes which he can determine satisfactorily without the aid of anything more than a common lens, and to these he will do well to pay attention in the first instance. If he wishes to become acquainted with structure, he must have recourse to a microscope, and he will then be able better to appreciate the nice shades which separate Fungi from neighbouring classes of the Vegetable Kingdom. It is a most fatal error in the student to attach himself in the first instance to the naming of every black speck he may chance to find, without a precise knowledge of structure; for in this case he is sure to end as a mere collector, without any title to the name of Fungologist.

It may be well to present in a tabular form the general outline which has been presented to my readers, noticing where practicable popular examples of each division.

### SPORIFEROUS FUNGI.

#### 1. HYMENOMYCETES.

- a. *Agaricini*. Mushroom. Chantarelle.
- b. *Polyporei*. Sap-balls.
- c. *Hydnei*. Spine-bearing Fungi.
- d. *Auricularini*. Stereum of Oak and Poplar.
- e. *Clavati*. Clavaria.
- f. *Tremellini*. Jew's-ear.

#### 2. GASTEROMYCETES.

- a. *Hypogæi*. Red Truffle of Bath.

- b. *Phalloidei*. Common Stinkhorn.
- c. *Trichogastres*. Puff-balls.
- d. *Myxogastres*. Dust Fungus of tanpits.
- e. *Nidulariei*. Birds'-nest Peziza.

## 3. CONIOMYCETES.

- a. *Sphæronemei*.
  - b. *Melanconiei*.
  - c. *Phragmotrichacei*.
  - d. *Torulacei*.
- } No popular types.
- e. *Pucciniæi*. Wheat Mildew.
  - f. *Cæomucei*. Smut. Bunt.

## 4. HYPHOMYCETES.

- a. *Isariacei*. Insect Club Mould.
- b. *Stilbacei*. Scarlet Tubercularia.
- c. *Dematiei*. Carbonized Moulds.
- d. *Mucedines*. Blue Mould. Yeast and Vinegar Fungus.
- e. *Sepedoniei*. Yellow Boletus Mould.

## SPORIDIIFEROUS FUNGI.

## 5. ASCOMYCETES.

- a. *Elvellacei*. Morel.
- b. *Tuberacei*. Truffle.
- c. *Phacidiacei*. Maple Mould.
- d. *Sphæriacei*. Candle-snuff Fungus.
- e. *Perisporiacei*. Hop Blight.
- f. *Onygenei*. Hoof Fungus.

## 6. PHYSOMYCETES.

- a. *Antennariæi*. Felt Moulds.
- b. *Mucorini*. Bread Mould, Pear Mould.

## CHAPTER II.

## NATURE OF FUNGI.

HAVING given some general notions of the objects of which it is proposed to render an account in this volume, I proceed to such considerations as to their nature, mode of growth, propagation, uses, properties, distribution, and structure, as may come within the scope of an essentially popular treatise, and so far as they can be explained without entering into abstruse discussions, which require a considerable portion of previous knowledge.

The most prominent question which arises naturally may be stated as follows:—Are these productions members of the Vegetable Kingdom equally with the leaf-bearing plants with which we are all so familiar; are the species as truly species as those which we meet with amongst them, or are Fungi mere creatures of accident, without any stability of character, and incapable of any rational arrangement?

Taking Fungi as a whole, there is not a shadow of doubt as to their being true vegetables. Discussions, indeed, once took place in consequence of erroneous observations respecting some supposed spontaneous motion in their reproductive bodies, as seen under the microscope, as to whether they might not be built up by little animals after the fashion

of corals; but it is now perfectly certain that such notions were ill-founded, and that these bodies agree in the main principles of growth and structure with other vegetables. In several species the complete progress from the minute spore to the perfect plant has been traced step by step, till the circle has been complete, and the new spore ready again for reproduction. In one group alone, as stated above (p. 13), doubts exist as to the real nature of the objects it contains, because the general mass does not usually consist of real filaments or cells, and the substance of which they are composed is of a different chemical nature from that which forms the framework of all known vegetables.\* Ultimately, however, true cells are always produced, and in one genus spiral vessels; and both Mr. Broome and myself have in certain genera observed distinct sacs growing from the fundamental framework and not from the mere slimy mass which it encloses, in which the spores are developed, and sometimes from a specific point, as in the higher Fungi (Plate 1, fig. 6), the free portion of the spore being rough with granules, while the inner portion, from its contact with other spores, is smooth.† Besides, in *Lycogala terrestris* there is as distinct a fibrillose spawn penetrating the soil as in any *Lycoperdon* (see Corda, fasc. 6, t. 2, fig. 37; and text, p. 15). Fries, moreover, in a letter received while writing this, calls my attention to the early stage of the fructiferous cells in the genus *Polysaccum*, and to the amorphous, unctuous, semiliquid state of young *Polyporus Schweinitzii*, resembling closely that of an infant *Æthelium*. Though, however, I have myself little doubt as to these productions being vegetables, as well as other Fungi, and I am

\* It is something like the "sarcode" of Dujardin, and not "cellulose."

† Exactly as in the achenia of many *Compositæ*, as, for example, in those of *Rhagadiolus*.

supported in this view by Fries, than whom no one is more eminent for tact and nice discrimination, it is right that I should not speak too positively, as the two brothers Tulasne, who have contributed so much to our knowledge of Fungi, incline rather, as it should seem, to De Bary's views, which they corroborate in some degree by the fact that many of these productions contain in their outer coat such a notable quantity of carbonate of lime, that a strong effervescence takes place on the application of sulphuric acid.

Setting, however, the *Myxogastres* aside, there is now no question as to the rest. As regards mere substance and duration, undoubted *Phænogams* vary almost as much as Fungi themselves, while one or two groups of *Phænogams*, as *Rafflesiaceæ* and *Balanophoræ*, of which an example is given (Plate 2, fig. 8), approach in form, substance, parasitic growth, comparative simplicity of structure, etc., in many respects to Fungi. But notwithstanding such peculiarities, they are as truly *Phænogams* as plants of other Orders, while in Fungi there is a character which we believe is wholly without example amongst *Phænogams*, viz. that they absorb oxygen when exposed to light, and give out carbonic acid, in which particular they resemble animals.

As regards the second point, whether the species are as definite as in other acknowledged parts of the Vegetable Kingdom, I answer without a moment's hesitation that there is in most cases far less difficulty in determining the limits of species. Amongst the *Polypori*, indeed, the limits are often very difficult to recognize, but if we take the large group of Agarics and its allies, with a few exceptions only, it may without doubt be asserted that more certain species do not exist in any part of the organized world than amongst Fungi. The same species constantly recur in the same places, and

if kinds not hitherto detected present themselves, they are either such as are well known in other districts, or species which have been overlooked, and which are found on better experience to be widely diffused. There is nothing like chance about their characters or growth. It is quite astonishing how few new species have been met with in Sweden since the publication of the 'Epicrisis' of Fries in 1838, though acute botanists have studied them most accurately in the course of the last twenty years, and especial attention has been lately paid to them with a view to making as complete a collection as possible of drawings of the fleshy or softer Fungi for the Museum at Stockholm, and of the few novelties which have turned up, some have already occurred elsewhere.\*

It is therefore almost useless to advert to the third notion, though a very common one, which would regard these productions as the creatures of chance, or of a happy concurrence of circumstances favourable to their growth from inorganic elements. It is true that they often occur in unexpected situations, and from their extreme rapidity of development, sometimes seem as if they could not have originated from anything like seed; but as accurate inquiries have now thrown light upon much of the mystery in which the origin of intestinal worms was but lately involved, so the phenomena which attend the growth of Fungi are gradually receiving light, and they are found to follow essentially the same laws as more perfect vegetables.

The notion of equivocal or spontaneous generation, indeed, is now all but exploded amongst scientific men. The most careful experiments show that, without pre-existent germs,

\* Copies of many of these drawings have been forwarded to me by the kindness of Fries, and from these I have already been enabled to recognize one of the very few new species (*Agaricus gliodermus*) as British.

no organized beings are ever produced from such solutions as contain matters fit to nourish minute animals or vegetables, though where proper precautions have not been taken to exclude the possibility of their access, they exist in myriads. That the spores of Fungi do get access somehow or other into very unexpected places is quite another question, and, like many other obscure matters of natural history, may some time or other meet with an easy explanation.\*

\* Since the above was written, De Bary has stated his views more explicitly respecting the *Myxogastres*. In *Lycogala epidendrum* he figures filaments very like those of *Dasyglæa*, a genus of fresh-water Algæ. It appears also, as Mr. Currey has seen in *Trichia*, that the young germinating spores in many species assume the characters of zoospores; but this does not prove that these productions are animals any more than that those Algæ in which zoospores occur, are so. Still less does the existence of sarcodæ tend to this conclusion, when it is remembered that cellulose, the peculiar distinctive mark in vegetable structure, occurs in undoubted animals.

## CHAPTER III.

## HABITATS OF FUNGI.

IT is difficult to point out any substance or situation where conditions exist capable of supporting vegetation, in which Fungi, in one or other of their forms, may not be developed. The general notion is that Fungi are essentially the creatures of decay; but this notion arises only from a very limited apprehension of the objects comprised under the name; for not only do we find them on putrescent logs or vegetables, but they occur sometimes on bare flints, on glass,—as on our window-panes and the lenses of microscopes,—or even on smooth metallic surfaces; but they establish themselves also in the most poisonous solutions, and in fluids where no decomposition has at present taken place. But more than this, they are found on living structures, whether animal or vegetable, at whose expense they grow. About fifteen years since, when so much was said and written about Fungi in consequence of the interest which was attached to the potato murrain, it was a favourite dictum, even amongst men of some pretensions to science, that Fungi could not grow upon healthy substances. It is, however, now a well-established fact that the most healthy tissues may be affected by Fungi, though they rapidly become diseased under their influence. Deferring

for the present the consideration of this influence, I shall simply indicate some of the peculiar situations in which Fungi are occasionally found.

Amongst the higher Fungi, the *Coprini* (Plate 12, fig. 1), and those species of *Agaricus*, as for example *A. disseminatus*, which are most nearly allied to them, are most capricious in their habitats. Old damp carpets, naked walls, pestilential drains entirely concealed from sight, and other anomalous situations, are amongst those in which they assume an occasional habitat, their proper place for the most part being decayed wood, or the dung of graminivorous animals, which closely resembles it in the Fungi which it nourishes. As the *Coprini* are amongst the most rapid in their growth of any Fungi, as every one knows who has watched their progress in a new hot-bed, they sometimes appear in the most unexpected situations. It is, for instance, not very uncommon to find them on the dressings of amputated limbs, and surgeons are in consequence sometimes very unjustly charged with negligence by persons who are not acquainted with the speed with which a *Coprinus* may pass through every stage of growth from the spore to the perfect pileus. Where these plants—as, for example, *Coprinus radiatus* and *Agaricus disseminatus*—are developed on bare walls, they throw out an enormous quantity of mycelium, in order to avail themselves as much as possible of the moisture of the surrounding air.

Though Fungi cannot exist without a certain degree of moisture, they suffer in general from its excess. A few species, however, are never found except on substances immersed in water. The beautiful scarlet *Mitrula paludosa*, which is the ornament in summer of every little quiescent drain in some parts of Wales, uniformly grows on leaves or other decayed vegetable matter floating in water, while *Vibrissea*

*truncorum*, so remarkable for shooting out its long thread-like sporidia under the influence of the sun, is found on immersed logs or sticks. A fine *Sphaeria*, not yet observed in this country, is found in Algiers on submarine phænogams, and other instances occur where the daily wash of salt-water has not prevented the growth of Fungi. The ubiquitous *Sphaeria herbarum* flourishes even on seaweed thrown up by the waves.

I am not at liberty to reckon as Fungi the curious Moulds which grow on dead fish, making them conspicuous as they float on the surface of the water by the foggy halo which surrounds them. These productions differ so essentially in their mode of reproduction from Fungi in general, that at present it would be rash to speak too positively about them; but, inasmuch as their peculiar characters seem to depend entirely upon the degree of moisture to which they are exposed, there is some reason to hesitate and to wait for further information. I have no doubt that the Mould which is so common on flies in autumn, oozing out as it were between their abdominal rings, is a mere condition of one of these anomalous productions. Nay, it was known long since that the same animal which, when immersed in water, produced one of these puzzling plants, when exposed to a slight degree of moisture gave birth to a true *Mucor*, or Mould.

A gigantic Mould, of a dark shining green when dry, appears frequently on casks, or on the walls in oil-mills. The same species occurs sometimes in great abundance on casks of grease, flourishing in the most wonderful degree, and ultimately exhausting to a great depth the substance in which it grows. As it is far larger than any of the common species of *Mucor* which grow on fruit or decaying vegetables, it was long considered as belonging to a distinct genus, under the

name of *Phycomyces*; but this notion is now abolished, and it takes its place as the prince of these powers of putrescence.

One of the most curious properties of certain Fungi is their capability of growth in substances which are in general destructive to vegetables. Tannin is one of these substances, and yet a Fungus very frequently makes its appearance on the wood with which the tan-pits are lined. It is perhaps not so surprising, that many species prefer spent tan to almost any other substance, though even this does not seem favourable to phænogams, except so far as it is useful in raising the temperature of the houses in which they grow. Many vegetable poisons, as opium, though innocuous to the plants by which they are produced so long as they remain in their proper cells or receptacles, are positively destructive when mixed with the fluid which is taken up by their roots. More than one species of Fungus, however, is developed on extracted opium, and the factories in India have suffered greatly from their presence. Solutions of arsenic, sulphate of iron, sulphate of copper, etc., though highly concentrated, do not prevent the growth of some Fungi of a low order, though at once destructive to others. A few years since, a little Mould, developed in the solution of copper used for electrotyping in the department of the Coast Survey of Washington, proved an intolerable nuisance. Strange to say, it decomposes the salt, assimilating the sulphuric acid, and rejecting the copper, which is deposited round its threads in a metallic form.\* These productions, indeed, are sometimes referred to *Algæ*, from their submersed mode of growth; but they are mostly common species of Mould, and very distantly related to *Algæ*.

One of these Moulds is sometimes developed in strong wine, as in Madeira. A Mould, however, of a very different habit

\* Harvey, 'Nereis Boreali-Americana,' part i. p. 6.

and colour (*Antennaria cellaris*) is peculiarly attached to wine-cellars, where it is the pride of the merchant when it hangs about the walls in black powdery tufts. It is not, however, the only occupant of wine-cellars. There is a Fungus, whose exact character is unknown, which first attacks the corks of wine-bottles, destroying their texture, and at length impregnates the wine with such an unpleasant taste and odour that it is perfectly unfit for use; while another, equally obscure as to its kindred, after preying upon the corks, sends down branched threads into the liquid, at length rendering it a mere *caput mortuum*. Dry-rot, again, is peculiarly attached to cellars, to the destruction of wine-shelves; and an instance is on record in which this or some other Fungus attacked a cask of wine, and increased to such an extent as to completely block up the entrance. The wood of the cask was the first object of attack, but the wine supplied a great portion of the sustenance of this enormous monster, which is only equalled by the great curtain of Dry-rot which lately covered the walls of a sandstone railway tunnel in the north of England.

Perhaps the most curious circumstance under which Fungi are developed is when they are found in situations apparently completely excluded from the external air, as the Potato Mould, in the cavities of the fruit of Tomato, *Dactylium roseum* in the hazel-nut, or a red *Penicillium* in an egg. The spawn of Fungi, however, is capable of making its way, and that very rapidly, through the closest structures. In some cases its progress from without is easily traced, in others it is wholly obscure, and yet in multitudes of instances, as in a large proportion of the *Sphaeriacei*, it is quite certain that it must have penetrated at some period into the matrix, whether in a living or a dead condition. A few minute species, indeed, have never been found in any other situation

than in the cavities of the cells of phænogams, or their inter-cellular spaces. The presence, however, of the little animal in the cerebral cysts, which causes the disease known under the name of 'giddiness' in sheep, was once equally obscure, and even since its origin is known, the rapidity with which the young of the tapeworm of the dog, after it has been swallowed by the sheep, penetrates the brain through a very devious course, is marvel enough to command all our powers of faith.

The existence of Fungi on the mucous membrane of animals, or in other situations, will be noticed when I come to the consideration of the diseases produced by Fungi.

Two other circumstances, however, require a few lines before I close this Chapter. The first of these is the occurrence of Mould in the inside of bread a few hours after it is baked. This was at one time notoriously the case with the coarse "pain de munition," or barrack-bread, at Paris. A beautiful red Mould appeared in its very centre within an incredibly short space of time. It was, however, found that the spores of certain Fungi would bear moist heat equal to that of boiling water without losing their power of germination. They have also considerable powers of resisting frost, but the exact limits in either case under varying circumstances have not at present been ascertained.

The other point is the apparently sudden development of fungous matter on cooked provisions, whether animal or vegetable, in very hot weather. As the Fungus thus produced is of a bright blood-red, and often spreads in little jets as if spirted from an artery, it has been supposed to arise from a rain of blood. The production is not, however, so uncommon as is supposed, and may be seen almost every year on some of the larger and more perfect Fungi when in a state of decay, though

in small quantities. When in abundance it is very beautiful, and in hot weather it may be cultivated with great ease on rice paste. The growth of these productions is, however, very capricious, and I have this autumn in vain attempted to cultivate it, which is the more provoking, as its real affinities and structure are at present very obscure.\*

It may be added, in conclusion, that the Fungi which attack animal substances are for the most part far from nice in their choice of a place of growth, but some which produce disease in animals are attached to particular insects, and a few which grow on decaying hoofs, horns, bones, feathers, wool, or hairs, are never found in any other situations. Leather for a long time seemed to be exempt from any Fungi save the commonest species of Mould, but Messrs. Broome and Currey have lately found a pretty *Ascobolus* on this substance when exposed to decay.

\* Together with the blood-rain, gelatinous spots of a bright yellow, blue, pink, grey, white, etc., often appear on the rice paste, identical in structure with the red. The matter which appears on meat in damp weather seems to be similar. The whole subject requires further investigation.

## CHAPTER IV.

## GEOGRAPHICAL DISTRIBUTION OF FUNGI.

THE reproductive bodies of Fungi are so small and easily wafted by the air,\* and, moreover, are in certain cases capable of enduring such high and low temperatures without losing their power of germination, that there are far greater facilities for their distribution than for that of phænogams. Wherever, therefore, similar conditions of soil, moisture, and other external accidents exist, or, at least, such conditions as are suited to the development of particular species, we are prepared to meet with the same or similar Fungi. Accordingly, if we take almost any extratropical island or district, we find a large portion of species identical with those of Europe, besides a certain number of closely-allied species; and in proportion as such places present at times conditions approximating those of tropical or subtropical countries, we have a varying proportion of truly tropical or subtropical species. If, for instance, we take Tasmania, of which only a portion of the Fungi are at present known, we find, out of 275 species,

\* Spores of Fungi, for instance, have been detected apparently uninjured in the dust of the trade winds, in flakes of snow collected from the air, on the mucous surfaces of the internal organs of animals, in the dejections of cholera, etc.

113 British, 20 European species which may be expected to occur in this country, 95 Tasmanian species of European type, 19 subtropical, with 28 of extra-European type—Chilian, Antarctic, and Tasmanian. If New Zealand be the point of comparison, we have in 158 species 48 British species, 6 European, 3 cosmopolites, 19 tropical and subtropical, with a few from various localities, 42 new species of European forms, 5 Australian forms and 28 subtropical, or, in other words, 58 tropical and subtropical types, including all that are not European, and 100 European. The proportion of European types is, therefore, much larger in Tasmania than New Zealand, though we have still a large proportion in the latter locality. Even in tropical countries—that is, tropical not only as to latitude but as to climate, for with high elevations we may have alpine seasons—we always find a certain though variable proportion of European species. In Cuba, for instance, there is a fourth, in Java a third, while in the Philippine Islands there is only a twentieth of such species. Amongst these are a few species found in every part of the globe.

The scope of this work does not admit of any closer computation, though materials are not wanting for fuller comparisons than have yet been made. Still much yet remains to be done amongst tropical Fungi. Those of the greater part of India, for instance, except as regards the Himalayas, are almost unknown. It must be remembered, however, that altitude has more to do with the presence of particular species than latitude. As regards the Sikkim Himalayas, for example, we have in the hissing hot valleys towards their base, truly tropical species; higher up are subtropical species of Ceylon and Java; then those of southern Europe; while as you ascend, multitudes of species either identical with or closely allied to northern European species make their ap-

pearance, and do not cease till we reach an altitude of 18,000 feet.

In respect of genera, they are in general diffused almost indiscriminately over the surface of the globe. A few genera only are peculiar to warm climates, and some of these have their representatives on either side of the basin of the Mediterranean. The same species occur sometimes at great distances from each other, being confined to small districts in each locality. Java, the Sikkim Himalayas, New Zealand, and South Carolina, produce a curious plant,\* allied to *Geaster*, which occurs on decayed laurels, without any intermediate stations, and other instances might be brought forward. The species which occur in different tropical countries often differ widely, especially the *Polypori*, but it is certain that there are hundreds of undescribed species to reward future researches, and till the genus has been more closely studied, it is difficult as yet to come to any accurate conclusions.

As regards cosmopolite species, it is curious that the common Mushroom is one of the most universally diffused, but it may be doubted whether this has not accompanied the introduction of the horse, consequent on the dispersion of the human race.

But little has at present been made public respecting the distribution of species in Europe. Fries is, however, collecting materials for the solution of this difficult question. The great evil is, that so few persons have made such a critical study of the more important species which retain their characters but imperfectly when dried, that it is not always possible to give implicit credit to lists of species which may be published in local Floras. Indeed, some notion of the difficulty may be found from the frequent alterations of sy-

\* *Trichoscytale paradoxa*.

nonyms which appear in the works even of the best Fungologists. Much remains also to be done in the south of Europe, notwithstanding the labours of such trustworthy authorities as Vittadini, and till the Southern Fungi are worked out in the same spirit and with the same accuracy with which he has attacked a portion of the Fungi of Italy, it will be impossible to ascertain correctly the limits of species.

It is requisite, however, not only to study their limits in latitude, but the geological limits also. These will probably prove far more striking. The predominance of Truffles in limestone formations above other strata is a well-known fact, and there is little doubt that a comparison of lists belonging to different formations would give equally striking results in other groups. The subject is well worth attention, and will be found highly interesting to those who have facilities of visiting different districts for comparison. It must be remembered, in considering this subject, that species cannot become permanent inhabitants of any district if extremes exist destructive to their spawn. Excessive drought, or moisture, extreme heat or cold at certain times of the year, may prevent the establishment of a species, especially where that species is a long time before it sends up perfect fruit from its spawn. It is probable that few ever make their appearance which are not able to exist permanently. The Vine Mildew and Potato Mould are at present examples in favour of this notion, but it is to be hoped that, under some peculiar concurrence of circumstances fatal to their growth, they also may at length entirely disappear.

But little can be said of the occurrence of Fungi in earlier periods of the earth, before the introduction of man into the universe. No certain traces of Fungi are to be met with till very recent periods, though a few anomalous productions have

been referred to that tribe from mere external resemblance. We know at least that the genus *Penicillium* was contemporaneous with the pines which yielded amber, and one or two more genera undoubtedly existed at the same time. It is probable, too, that some of the black specks which occur on leaves in very recent deposits are due to Sphæriaceous Fungi, but I know nothing of them except from the published figures. *Polyporus lucidus* (Plate 16, fig. 2) occurs in a fossil state in the Fens of Cambridgeshire. A specimen in the Kew Museum is singularly like one from the Sikkim Himalaya placed by its side.

## CHAPTER V.

## GROWTH OF FUNGI.

FUNGI consist of two principal parts, the vegetative and the fructifying. If we take for instance a common Mushroom, the vegetative is represented by the spawn, which for a time carries on all the existing functions of the plant; the fructifying by the stem with its cap and gills, which bears nearly the same relation to the spawn, as the flower with its various organs to the stem on which it grows. The spawn may flourish for years without ever bearing any fruit, but fruit can never be produced without spawn. This fact is generally overlooked, because the fruit bears usually so very large a proportion to the spawn; but the proportion is not greater than in many parasitic plants—as, for instance, in the *Rafflesia*, which grows on the roots of *Cissus*, with but a very slight apparatus between the flowers and the matrix; and the same may be said of *Balanophora*, of which one is represented in Plate 2, fig. 8.

The spawn of Fungi, whether in a cellular or filamentous condition,—for it undergoes an infinite variety of modifications,—is developed in various situations, and even when present beyond a doubt amongst the tissues of plants at whose expense it lives, is very difficult to detect, in consequence of

the ease with which it may be confounded with the divided walls of the cells and little fragments which project from them when a section is made for the microscope. At times, however, all difficulty ceases, and in potatoes affected with the Mould which bears so great a part in the production of the Potato murrain I have seen instances in which the tissues were almost entirely replaced by the spawn of the Fungus.

One peculiarity about the growth of Fungi is the tendency which they have to assume a circular disposition, and that not merely in cases where the spawn is perennial, but where the whole existence of the Fungus is confined to a few days or weeks. A mass of spawn, however, it must be observed, does not arise in general from a single spore, but from a collection of spores, which spread in every direction and form a common felt from whence the fruit rises. I will not enter upon the question whether it is possible that several spores, after making a common felt, may enter into the composition of the same fruit. This is indeed asserted by Ehrenberg, but the point is one of extreme delicacy, and requires much confirmation before it can be received as an established fact. Nevertheless, as the mass grows from a common centre, it is conceivable enough that at a common distance from that centre the spawn should be in a fit condition to produce fruit, and that as it continues to spread, the same process should take place again; and that, in this way, a concentric arrangement of the fruit should take place, as is the case in some Lichens; as, for example, in that formerly known under the name of *Lichen concentricus*.\* This disposition is especially evident in some of the parasites which affect fruit, and in none more so than in *Oidium fructigenum*, a Mould which is extremely

\* Now *Lecidea atro-alba*.

common in autumn on pears, apples, and other fruit, and frequently while yet hanging on the tree.

In the fields we see this tendency illustrated by the formation of fairy rings, which have for a long time puzzled philosophers, and are not without their difficulties now. These rings are sometimes of very ancient date, and attain enormous dimensions, so as to be distinctly visible on a hillside from a considerable distance. It is believed that they originate from a single Fungus, whose growth renders the soil immediately beneath unfit for its reproduction. The spawn, however, spreads all round, and in the second year produces a crop, whose spawn spreads again, the soil behind forbidding its return in that direction. Thus the circle is continually increased, and extends indefinitely till some cause intervenes to destroy it. If the spawn did not spread on all sides at first, an arc of a circle only is produced. The manure arising from the dead Fungi of the former years makes the grass peculiarly vigorous around, so as to render the circle visible even when there is no external appearance of the Fungus, and the contrast is often the stronger from that behind being killed by the old spawn. This mode of growth is far more common than is supposed, and may be observed constantly in our woods, where the spawn can spread only in the soil or amongst the leaves and decaying fragments which cover it.

The rapidity with which spawn penetrates, and the depth to which it enters, is often quite surprising. The most solid timber, in a few months, when exposed to the weather and in a damp situation favourable to the development of Fungi, will sometimes show unequivocal traces of spawn. I have seen, for instance, elm trunks which were perfectly sound when felled, penetrated by the end of the second year with spawn to within a few inches of the centre; and in this case

it must be remembered that vegetation goes on in the trunk for nearly a twelvemonth before any Fungi can establish themselves. The growth of Dry-rot is unfortunately familiar to all, and instances occur in which its spawn not only enters the wood, but penetrates solid structures of brick.

When spawn has once taken possession of a spot favourable to its growth, it is astonishing what an immense resistance it will sometimes overcome. Large flagstones, for instance, are sometimes raised by Mushrooms, and even tender species like the *Coprini* (Plate 12, fig. 1) will sometimes resist a considerable pressure.

Where the spawn of Fungi has high powers of vegetation, but no possibility of getting access to the external air, it assumes peculiar forms which are sometimes extremely puzzling. In the middle of a solid trunk, for instance, it forms black plates,—as in the case of the common scaly Sapball, *Polyporus squamosus*, and several of the more solid *Sphæriacei*,—while, when running between the bark and wood, it assumes the form of a flat, anastomosing, black seaweed, rather than of a Fungus, in which cases it is known under the name of *Rhizomorpha subcorticalis*, etc. This form is assumed by the spawn of various *Polypori* and *Xylariæ*, and in some cases the condition to a certain extent seems to be almost normal. The absence of light, too, impedes the proper development of Fungi, and hence a variety of forms occur, very few of which perfect their fruit. I have even found a *Coprinus*, which grew down from the interior of the roof of a hovel, though perfect in other respects, absolutely devoid of fruit.

Spawn, as said above, may exist for years without producing fruit, and it is probable that this is equally the case whether it runs through soil or decaying substances, or amongst living tissues, whether without or within their walls.

Wheat Mildew, for instance, often arrives at a certain stage of growth without perfecting its fruit, a fact which sufficiently accounts for the apparently sudden appearance which it makes in seasons favourable to its full development amongst our crops.

As regards the growth of individual Fungi, it takes place essentially in a direction from the centre to the circumference, or, in other words, it is centrifugal. Hence a *Polyporus*, such as *P. fraxineus*, involves every stick and blade of grass in its way as it increases in diameter. The mode of growth is admirably illustrated by a section of *Polyporus hispidus*, so common on apple-trees, in which the threads of which it is composed are seen to radiate in one direction towards the pileus, where their free ends form the hispid fascicles on the surface, and in another direction towards the hymenium, where they form the walls of the tubes and sporophores. It is not indeed intimated that no growth takes place in any other direction, but that the main direction is centrifugal.

Fungi are in general of short duration, but some go on increasing for years. *Polyporus fraxineus*, though only a few inches across, the first year, attains at length a breadth of as many feet. Some of the stipitate *Polypori* scarcely attain their full characters till the second year, and a few even of the softer species, if they get through the winter, sprout again from the portion of tissue which remains sound. In such case, though at first the nutriment was derived from the matrix, by means of the spawn which performs the functions of roots, life is carried on by the absorption of surrounding moisture, and perhaps partly at the expense of the dead Fungi. Even some Agarics, as *A. fusipes* (Plate 5, fig. 5), seem sometimes to sprout from the decayed stumps of the previous year, without any fresh mycelium.

## CHAPTER VI.

## STRUCTURE OF FUNGI.

FUNGI, with very few exceptions, consist entirely of cells. In about three genera alone is there anything at all resembling the true vessels of flowering plants. These cells appear under a variety of forms, from that of regular globules, to thin cylindrical threads. In some cases, as in certain species of *Botrytis*\* (Plate 1, fig. 7), the whole plant consists of a single branched cell, without any dissepiments, exactly as in some of the scumlike green plants which float upon our stagnant pools.† These cells generally contain a granular mass, but in many Fungi the contents of certain privileged sacs are transformed into bodies of various forms, capable of reproducing the species, called Sporidia (Plate 1, fig. 2 *b*), while in others distinct cells are formed at the tips of certain

\* These species, which grow on living leaves, are now commonly referred to the genus *Peronospora*. They doubtless form a distinct group, but if these be separated, the genus *Botrytis* will no longer exist, for the others will pass to *Verticillium*, *Polyactis*, and other genera. Nothing can be more absurd than to break up a genus, and discard the original title altogether. Micheli's *Botrytis* is evidently the same with *Polyactis*, and as that genus is now almost universally adopted, the name *Botrytis* ought to be reserved for *Botrytis parasitica* and its allies, as that species was the first which received the generic name after the time of Micheli.

† As in the genus *Vaucheria*.

threads or of their ramifications, when they are called Spores (Plate 1, fig. 1 *a*). Hence when Fungi are reduced to the very simplest forms under which they can appear, we have on the one hand the genus *Gymnosporium* (Plate 1, fig. 8), which consists of an almost rudimentary base or spawn, for no Fungus can grow without\* some cells or threads, however obscure, from which the fruit may spring. On the other hand, we have the genus *Ascomyces* (Plate 1, fig. 9), consisting in like manner of asci filled with sporidia.

In these cases the reproductive organs predominate to the almost total exclusion of the vegetative. In almost every case, however, the parts which bear those organs are the most conspicuous, and often the only ones which attract general notice. The pileus of an Agaric, for instance, with its stem and gills, or, speaking collectively, the fruit, is far more prominent than the spawn or mycelium. The largest Agaric, however, admits of close comparison with the simplest Mould. Let us take as an example *Botrytis* (Plate 1, fig. 7). We have three evident parts: the horizontal threads which creep amongst the loose tissue of the under side of the leaves, which answers to the spawn of the Mushroom; the erect threads which spring from it, bursting through the stomates, which are represented in the Mushroom by the threads or cellular tissue of which the stem of the Mushroom is composed, and which, branching in every direction, pass into the cap, and from thence into the gills,† where their free extremities

\* The Yeast-plant may seem an exception. It must be remembered, however, that it is originally derived from a Mould or Moulds, which have two distinct parts, the spawn, or, as it is called in this case, *hypha*, and the fruit-bearing threads.

† According to Bonorden, in some cases the external cells of the stem form the fructifying portion of the gills, but this is exceptional, the fructifying tissue of those organs being in general derived from the cells of the cap or pileus.

bear fruit almost exactly in the same way, as may be seen by comparing the spore-bearing cells of an Agaric (Plate 1, fig. 1) with those of *Botrytis curta* (Plate 1, fig. 7 *b*). The lower part of the thread of the Mould answers to the sporophore (Plate 1, fig. 1 *c*), the short branchlets to the spicules, (Fig. 1 *b*), and the spores to those organs in the Agaric (Fig. 1 *a*).

I have chosen as an object of comparison with the Mould a genus which has reached almost the highest development of which a Fungus is capable; but the same reasoning applies to every other case amongst the spore-bearing Fungi.

The justice of the notion that the highest Fungi may be considered as consisting, theoretically, of a mass of closely-compacted Mould, is proved by the great difficulty which there is in distinguishing the highest *Hyphomycetes* from the lower *Clavati*. The only difference is, that in the latter the sporophores are more decidedly distinguishable from the tissue that bears them than in the former. In the one case the spores are seated on distinct organs, in the other on the mere tips of the component threads, and even this distinction is not always available. It is, moreover, curious that, under certain circumstances, the common *Penicillium glaucum*, instead of forming, as it usually does, a continuous stratum, breaks up into little tufts, and in some cases the threads composing these tufts are so incorporated as to form a sort of common stem, with a globose head of spores, and the condition which thus results has been formed into the genus *Coremium*, or where a still greater concentration has taken place, it has been described as a *Stilbum*, one of the highest forms which Moulds are capable of assuming.

The hard, carbonaceous tissue of which the perithecia of most *Sphariacci* and of the cognate forms amongst the *Coniomycetes*,—if indeed there are any of these which are not mere condi-

tions of species in the former group—is formed, seems at first sight totally different from that of other Fungi. But the gradations are very gentle, and every intermediate condition may be found. In these as much as in the Fungi of the primary group, there is a distinction of spawn and fruit, though the difference is in this case even more highly exaggerated, especially in those instances where a distinct receptacle occurs, in which the perithecia are lodged, as in *Xylaria* (Plate 24, fig. 1, 2), and *Cordiceps* (Plate 23, fig. 4, 5, 6, 7).

Beside the general tissue of which Fungi are composed, in a few species, as the *Lactarii* (Plate 13, fig. 2, 3, 4), or milky Agarics, there are distinct vessels like the vessels of the latex in phænogams, which contain a milky fluid. They exist in all parts of the plant, especially in the gills, where they part with their contents on the slightest touch. This fluid is of various colours, mild or extremely acrid, and often changes colour when exposed to the air. When dry it forms an unctuous mass, which burns with a brilliant flame. In some *Russulæ* (Plate 13, fig. 5, 6, 7, 8), though probably not in the species represented in the Plate, these vessels exist, but contain a watery fluid only.

In many Fungi, something at first sight quite distinct from the cellular tissue seems to exist, in the shape of a viscid fluid which clothes the surface, or which occupies in a more or less condensed form portions of the plant. In every case, however, in which I have examined this under the microscope, the slime appears to be formed of extremely delicate gelatinous threads, while the firmer gelatine is formed either of similar threads or of threads with extremely thick external walls and a very slender cavity.

The soft pulpy mass of which the *Myxogastres* are composed, destitute as it is of cells, and hardening into threads and peridia equally destitute apparently of organic structure,

is one of the most remarkable phenomena amongst Fungi, and without example amongst other plants. It sometimes, however, proceeds from a mycelium, and in the end always gives rise to fruit-cells, and sometimes to spiral tissue, and is therefore by itself no sufficient reason for excluding these productions from the rank of vegetables.

The colour of Fungi depends in most cases upon the contents of the cells, except in those instances where the walls of the cells themselves are carbonized. These contents are of almost every colour except a pure green. When green occurs in Fungi, as in *Peziza æruginosa*, *Agaricus æruginosus*, etc., it is generally of a metallic hue, or dull and inclined to olive, as in the green *Russulæ*.

I notice, in conclusion, under this head, one or two properties occasionally exhibited by Fungi. The most notable of these is the luminosity of some species. *Agaricus olearius*, for instance, which grows on olive-trees in the south of France, is so luminous that it is possible to distinguish letters by its light, and still more luminous species have been found in Brazil, Australia, and Amboyna. We are not, however, without luminous Fungi in this country, but the phenomenon is rare, and has been observed principally in imperfectly developed species. Decayed wood and leaves also are sometimes luminous, but whether from the presence of fungous matter or not, is not quite certain.

I am not aware that in these cases there is any accession of heat, but Dutrochet has observed that more heat is generated by *Boletus æneus* occasionally than by any other vegetable.

It has been asserted that powerful odours are destructive to Fungi, and especially that of Russian leather; but I do not find this confirmed by my own experience, at any rate as far as regards the instance alleged.

## CHAPTER VII.

## PROPAGATION OF FUNGI.

FUNGI are propagated by cells, which either separate by means of a constriction from privileged portions of their tissue (*spores*) (Plate 1, fig. 1), or are produced freely (*sporidia*) within certain sacs called asci (Plate 1, fig. 2) or sporangia. In a few exceptional cases, though attached to the tips of the fruit-bearing threads, they are surrounded by a common membrane (Plate 1, fig. 3, 6). Whether the reproductive bodies, however, be called spores or sporidia, they have a singular tendency to appear in definite numbers, either in twos, fours, or multiples of four. Amongst the lower sporiferous Fungi there is seldom any attempt at arrangement; but in the higher, the sporophores almost uniformly have four spicules, and each of these is surmounted by a single spore. Very rarely there are but two, and still more rarely, as in *Phallus*, the number exceeds four. Amongst the sporidiiferous Fungi, the most common number of sporidia in each ascus is eight; where they are very large, this is sometimes reduced to four, and, on the contrary, sometimes increased to sixteen, thirty-two, etc. In some cases the number is indefinite, and, as far as I know, amongst the *Vesiculiferi* always so. The same law does not hold good when

the sporidia themselves are divided, though the first septum is generally found in the centre, and the two halves are often divided in like manner. Multitudes of exceptions however occur, though the normal plan is probably symmetrical.

Sometimes both forms of fructification take place or co-exist in the same plant, and then the free cells are called conidia or stylospores: conidia when the threads which bear them are exposed; stylospores when they are produced within the same or distinct perithecia (*pycnidia*), or when they accompany the asci, being closely packed with them in the hymenium. Sometimes conidia, stylospores, and sporidia may be produced in the same plant, and even where the normal fruit consists of spores without sporidia, there may occasionally be conidia.

Spores, though apparently globose or ellipsoid under the microscope, are often very thin and hollowed out on one side like the seeds of a *Veronica*, and amongst the *Sphaeriacei* there are sporidia which have the same peculiarity.

Sporidia are in general more complicated than spores, but whether the cell is simple or variously divided horizontally and vertically by partitions or septa, the structure is still the same. They consist of two or more membranes containing a granular mass, in the midst of which there are frequently one or more oil-globules or distinct cytoblasts. Germination takes place either by the protrusion of a part of the two walls together, or by that of the inner wall, which perforates or ruptures the outer, if a pore be not previously in existence. Where the spores or sporidia are compound, each joint will sometimes germinate at the same time, but occasionally they break up into separate parts, and in these cases it is sometimes convenient to consider each part as a distinct reproductive organ.

Besides these propagative bodies, other extremely minute bodies are produced either on threads or in distinct perithecia or cells in certain Fungi, as *Bulgaria inquinans*, *Hysterium Rubi*, etc., which from analogy are supposed to have something to do with the impregnation of the normal fruit. In this case the organs which contained them are called antheridia, or spermogonia, and the bodies themselves spermatozoids. It is very doubtful at present whether the cells which project from the gills in *Agaricus*, *Coprinus*, *Boletus*, etc., are of the same nature, but it must be remembered that in many cryptogams the mode of impregnation far more closely resembles that in animals than that in phænogams, and therefore it does not follow that a more perfect type may not exist amongst the lower than amongst the higher Fungi. Sometimes amongst the ascigerous Fungi, as in *Nectria inaurata*, there are asci containing, the one eight sporidia, the other a multitude of minute granules. These secondary asci may perhaps with as much justice be considered antheridia as the bodies mentioned above. It is observable, however, that in the other cases the spermatozoids are always produced at the tips of delicate threads or their branchlets, while these little bodies are produced freely in the sacs like sporidia. It is to the Messieurs Tulasne that we are chiefly indebted for this knowledge, as also for the curious facts which I am about to mention.

In many of the parasitic Fungi, belonging to the same section as the Wheat Mildew and Bunt, a very curious process takes place. The reproductive organs, which from analogy are commonly called spores, do not directly propagate the plant. These bodies however germinate, and often at definite points, exactly after the fashion of pollen-grains, and after a time produce on their threads secondary and sometimes ter-

tiary spores capable of germinating. It is by these that the plant is really reproduced.

In the Bunt the process is easily observed. If a portion of the spores be laid on a piece of damp flannel or on a slip of glass, and properly secured from evaporation, a white floccose matter is soon seen upon them, and when examined by the microscope it is found that the spore first gives out an obtuse thread, which produces at the apex a coronet of curved delicate appendages like the spores of a *Fusisporium*, to which genus they were referred before their true character was ascertained;\* these soon become connected by lateral threads, and ultimately produce little oblong somewhat oblique cells, which germinate and reproduce the plant (Plate 1, fig. 5). The analogy between this and the development of pollen-grains on the one hand, and the formation of the prothallus in the higher cryptogams, is very curious.†

This mode of propagation is not unimportant as regards these parasites. It was quite clear that their spores could not enter by the stomates of the stem or leaves, or much less by the tender tissue of the spongelets of the roots. Nor, to take the case of Bunt as an illustration, was it more possible for the large blunt germinating threads of the first order thus to enter. By this mode of propagation, however, a far more delicate spawn is produced, and where the spores are not for a long time adherent to the mother plant, but are entirely blown away at an early period, as in the Smut, we have the spawn in the field ready to attack the seed the moment it is committed to the ground.

Besides these modes of propagation, Fungi are extensively propagated by fragments of the spawn, as for instance the

\* See 'Propagation of Bunt:' Berkeley, in Journ. of Hort. Soc. vol. ii. p. 107.

† These points are discussed in the 'Introduction to Cryptogamic Botany,' p. 10, but they involve abstruse matters which would be out of place here.

yeast Fungus, which may be reproduced for centuries without ever throwing up the true fructifying threads, exactly as among Mosses, a species may exist age after age, though never bearing fruit.

In some instances undoubtedly when a plant is once thoroughly traversed by the spawn, even though it dies or is cut down by cold every year, a Fungus may be propagated for a certain time by that portion which remains in the perennial root. Plants for instance of *Achillea Ptarmica*, which I brought from Lille strongly infested with *Labrella Ptarmicæ*, yielded for a year or two scanty crops of the Fungus, till it ceased to appear altogether, and the same circumstance took place in my garden with *Viola odorata*, which was distorted with *Polycystis Violæ*. Similar instances have been observed at Paris. It is curious that so few of these parasites appear in our stoves. *Graphiola Phœnicis*, on one or two kinds of Palm, is almost the only one which has been observed, but whether imported or not it is difficult to say.

If those Moulds which infest fish or aquatic vegetables, as *Leptomitus*, *Saprolegnia*, etc., when immersed in water, be truly Fungi, we should have a more perfect type of impregnation than is presented by the supposed antheridia—at least one more nearly resembling that in animals; but we are not at liberty to assume their affinity to Fungi, and for the present they must be left amongst the *Algæ*, to which they approximate closely as regards their reproductive organs. For a history of these I must again refer to the ‘Introduction to Cryptogamic Botany.’

## CHAPTER VIII.

## VARIATIONS OF FUNGI.

REAL hybrids do not probably exist amongst Fungi, and if this be true, one source of perplexity will be removed which renders the task of discrimination of species difficult to the phænogamic botanist. In organisms which depend so much upon outward circumstances, considerable differences will indeed occur, but most of these, after a little study and experience, are easily estimated.

The same species will for instance present variations in size and colour, in the condition of the outer surface, in the form of the stem and pileus, in the breadth and attachment of the gills; and yet, amidst all, certain general features will be preserved which preclude much difficulty, though they make it extremely hard to draw up such characters as shall be generally applicable. Notwithstanding all the experience which the great Swedish Fungologist has had in the study of the fleshy Fungi, and clever as his characters confessedly are, and satisfactory taken as a whole, individual specimens constantly occur, from local modifications, which cannot be comprised within their limits. Nay, even generic and sectional characters are sometimes at fault. It is, for instance, frequently a matter of difficulty to distinguish an Agaric of the subgenus

*Tricholoma* from one of the subgenus *Clitocybe*, because, though one is distinguished by having the gills emarginate or sinuated behind before their attachment to the stem takes place, and the other has the gills acutely aduate without any emargination, modifications occur on either side; while in *Clitocybe*, in an early stage, there may be a decided emargination, in *Tricholoma*, from the depression of the pileus, the gills may become decurrent. And yet these characters are founded in nature, and are satisfactory enough when the variations to which they are subject are properly appreciated. Still more, changes of outward form may occasionally take place, inconsistent with the character of the species. Thus we may have umbonate individuals where the pileus ought simply to be obtuse, while a stemless Agaric may exhibit a stem or the contrary. The fact, however, is, that as in phænogamic botany the sum of characters must be looked to, while it is remembered that no definitions in natural history can be strictly mathematical. Where species are very difficult to distinguish, it is in general because forms are separated which are too closely allied, an evil which is familiar enough to every practical botanist, though apt to be overlooked or completely ignored by the inexperienced or mere localists. The essential characters are often the least superficial, and hence the young botanist is apt to make mistakes, from confounding mere analogies with affinities. Some Agarics of the subgenus *Pratella*, for instance, would never be separated from others of the subgenus *Lepiota*, without examining the nature of the spores. These organs, moreover, sometimes differ in closely allied species of such similar external characters, that it would be impossible to distinguish them without having recourse to the microscope.

If there is difficulty about species, there is often far more about genera. The characters in so natural a group are

necessarily founded on slight variations of structure, and the same species in different stages of growth might sometimes be referred with equal propriety to three or four genera. The transitions, for instance, from gills to folds, from sinuses arising from the union and ramification of gills to regular tubes or pores; and again, when these are broken up, from mere walls of pores, to teeth, warts, granules, etc., are almost infinite. Undoubted Agarics, for instance, may be found where the veins which connect the gills are so abundant and prominent that it is scarcely possible for the tyro to believe that he has an Agaric before him, looking merely to the definition of the genus. Indeed, there is an abnormal condition of the gills of many Agarics, where an hymenium is produced on the top of the pileus as well as beneath, in which the character of gills is quite lost. Such conditions have been found in *A. rubescens*, *A. odoratus*, *A. cerussatus*, *A. campestris*, *A. laccatatus*, and some others, and very puzzling they are to beginners.

Amongst the naked-seeded or sporiferous Fungi, the fruit varies but little; but in the sporidiiferous species the modifications of the sporidia in size, form, number of septa, etc., is often very great; insomuch that there is a disposition amongst many fungologists to undervalue microscopic characters. They are, however, of very great value, if the changes which they are liable to undergo in passing from infancy to full growth are properly borne in mind: indeed, without them it is utterly impossible to distinguish many species. It is not, however, within my scope to advert more particularly to this subject here.

There is one more variation of which Fungi are capable, of which it is necessary to add a few words. The hymenium, in the greater part of the vast group of *Hymenomyces*, is essentially turned away from the light, and we have just seen in

those instances in which it is accidentally formed on the upper surface, how much it is modified. There are, however, many of the lower species in which it is superior, in which case the hymenium is said to be resupinate. This character is not however constant, for when the substance on which the Fungus grows is placed in peculiar conditions, the edge of the patch will become detached, and will follow the common law of turning its hymenium away from the light, and thus from a resupinate will have become a reflected, or even a dimidiate Fungus. The contrary process sometimes takes place, by which dimidiate species become resupinate, insomuch that a vast quantity of resupinate *Polypori* are referable, when properly understood, to higher species. Even some *Agarics* are resupinate, but these occasionally turn away their hymenium from the light, or on the contrary the pileus which was at first shortly stipitate becomes gradually excentric and turns over, exposing the hymenium. The tendency amongst the higher *Hymenomycetes* is so strong to produce the hymenium on the lower side, that in some cases, especially in the genus *Polyporus*, if the plant be accidentally reversed, the hymenium is gradually obliterated, and a new hymenium formed on the other surface. In consequence, where *Polypori* are in very vigorous growth, it is often difficult to preserve them in a natural state. A little change of situation completely obliterates the orifices of the pores, and if an hymenium be formed above, the whole characters of the plant are altered.

Not only do many Fungi remain long in the state of spawn without forming fruit, but they give rise occasionally to productions quite at variance with the characters of the perfect plant. Hence a number of spurious genera and species originate which are justly struck out of every scientific Flora. The genus *Rhizomorpha*, for instance (as mentioned above, p. 42), where it is really fungoid, consists, except in a solitary

instance, of the spawn of different *Polypori* and *Sphaeriae*, altered by growing beneath the bark, free from the influence of light, in such a way as to form rootlike often anastomosing bodies, with a dark separable cuticle. *Sclerotium*, on the contrary, is formed by the concentration of threads into solid wartlike bodies or nuggets, entirely devoid of fruit, but which on occasion give rise to various kinds of Fungi, as *Agarics*, *Pistillariae*, *Pezizæ*, etc. In one instance I was enabled, in company with Mr. Hoffmann, to watch the progress of a thin slice of the *Sclerotium*, which is so common in mildewed onions, when placed in a drop of fluid in an air-tight cell, to the development from its tissues of a perfect *Mucor*. In some cases, the spawn merely collects earthy particles about it till it forms a large solid mass, which, when placed in proper conditions, produces fruit, as *Polyporus tuberaster*, a species commonly eaten in Italy. It is obvious that such productions cannot be admitted into a system,\* except so long as their nature is unknown. It is however feared that some of the Fungi which figure under different genera amongst *Coniomyces* and *Hyphomyces*, are in scarcely a better condition, though they have this difference, that they do produce a sort of fruit. Occasionally, under deficiency of light, Fungi possess a stem only, without any pileus, or only a very imperfect one; and sometimes, where perfect pilei are produced in one part, mere stems are formed in another, as if there were not vigour enough for every demand. This latter is the case to some extent with *Marasmius Rotula* (Plate 14, fig. 7), but it is far more conspicuous in some foreign species, as also

\* The best general rule is to admit nothing as a real species of Fungus which does not bear fruit. It is possible that such formations as *Sclerotium durum* may be due to half-a-dozen different Fungi. *Sclerotium complanatum* and *S. scutellatum* both give rise to the same species of *Pistillaria*. As, however, some persons may wish to know what species have been described, I shall give them in an appendix.

in some exotic *Polypori*. As regards the former case, *Lentinus lepideus* and *Polyporus squamosus* sometimes produce little more than stems, and in the latter the stem becomes so branched as to resemble a stag's-horn. *Agaricus ostreatus* also, when grown in a vault, assumes sometimes a most beautiful appearance, like that of a cauliflower, without any definite pilei. Sometimes even in the open air the stem swells above and forms a sort of club, without any pileus. This is the case in *Agaricus popinalis* and the North American *A. abortivus*. In some cases, again, the pileus, though developed, is never perfected, as in a curious form of *Lentinus tigrinus* not uncommon in the United States, where the whole forms a firm mass, suggesting, with its intricate abortive gills, some new genus, rather than that to which it really belongs.

I may mention here that a strange transformation takes place in a portion of the fruit of *Agaricus racemosus*. The stem bears little pilei on its sides, as well as one which is terminal. This latter has gills like a common Agaric, but the lateral pilei are spurious, and have the structure of a *Stilbum*. A somewhat analogous circumstance takes place in some species of *Ascophora*, where the lower vesicles contain very different sporidia from that which is terminal, though in other respects the difference is not so striking as in the Agaric just mentioned. Species of *Nyctalis*, when attacked by *Asterophora*, become nearly abortive, though there is still some trace of gills.

The spores of Agarics, though apparently perfect, are sometimes deficient as to their internal structure, and therefore abortive; and I have observed the sporidia in *Spheria* to become diseased from the conversion of their contents into a dark solid mass.

## CHAPTER IX.

## USES OF FUNGI.

FUNGI perform an important office in the economy of Nature, though they do not tend, like other plants, to keep up the balance between the animal and vegetable world as regards the supply of oxygen, which they tend to diminish rather than to replace. They, however, not only afford a supply of nutriment to hundreds of living beings, but by their fermentative and putrefactive powers, as well as their living so often at the expense of the hardest vegetable structures, which they tend to decompose, they prepare a rich supply of vegetable mould for future generations, besides destroying those structures which have already performed their functions, and are merely cumbering the surface of the earth.

As Fungi are in general highly nitrogenous vegetables, it is probable, *à priori*, if they contain no poisonous or injurious element, and are not disagreeable in taste, that they will form an acceptable and nutritious article of food. Experience shows this to be the case; for not only do savage tribes like the Fuegians adopt certain species as their staple food during many months, but in a considerable part of Europe Fungi are largely consumed when fresh, and preserved in casks for winter use. It should seem that, for this latter purpose, such

species as are firm and easily preserved are collected almost indiscriminately, the vinegar in which they are kept in all probability neutralizing the poisonous alkali which all of them contain in a greater or less proportion. The use, however, of fresh Fungi is not always unattended with danger. Some species seem to be uniformly poisonous, while others,—and amongst these even the common Mushroom,—though usually safe, occasionally lead to mischief. This, in all probability, depends upon the varying quantity of poisonous alkali which enters into their composition. Incredible as it may seem to us, who never scruple to eat the true Mushroom, that species is most carefully excluded from Italian markets; while, on the contrary, with the exception of the Truffle and Morel, it is almost the only one which is allowed to be exposed for sale in Paris.

In countries where the consumption of Fungi is large, accidents constantly happen, notwithstanding the pains which are taken to exclude doubtful species from the markets, in consequence of mistakes as to species, though it is probable that the peasantry are far better acquainted with their distinctions than ourselves. In our own country, the prejudice against the use of anything except the common Mushroom is very strong. We are, however, surrounded by a great deal of wholesome and pleasant food, of which we cannot avail ourselves from mere ignorance. The common fairy-ring Champignon (Plate 14, fig. 5), for example, is the very best of all our Fungi, and yet there is scarcely one person in a thousand who dare venture to use it. With common observation, no mistake need be made, though another species of *Marasmius*, *M. urens* (Plate 14, fig. 3), possessing highly acrid qualities, sometimes accompanies it, and might pass muster, if attention be not paid to the narrower gills and their darker colour.

It is not, however, my intention to enter at length upon the esculent properties of Fungi. To do so, would require more space than I can command, and the work is done so well in Dr. Badham's treatise on the subject,\* and Mrs. Hussey's 'Illustrations of British Mycology,' that there is no necessity for saying more upon the subject here.† In the latter especially will be found some excellent receipts and a vast variety of information, the result of actual experiment. I am not, indeed, such an enthusiast on this point as my lamented friends, but I am quite ready to subscribe to their views as to the advantage which might be derived from the use of many species. The accidents which arise in this country are very few, and generally due to the grossest ignorance. It should, however, be observed, that it is not always the poisonous properties of species that are to be questioned. A man after a long day's fast, for instance, eats a pound or two of Mushrooms badly cooked, and frequently without a proper quantity of bread to secure their mastication, and is then surprised that he has a frightful fit of indigestion. There are, again, peculiarities of constitution, which will not admit certain kinds of food, even of the most harmless description. Some sorts of animal food—as pork, shell-fish, etc.—are absolute poison to individuals; and I have a friend who cannot eat the smallest portion of an egg, however prepared, without serious inconvenience.

I believe a great deal frequently depends upon the quantity of bread which is eaten with them. In countries where coarse bread is largely consumed, raw vegetable diet, such as would

\* 'The Esculent Funguses of England,' by the Rev. Dr. Badham, with 20 coloured plates; 8vo.

† 'Illustrations of British Mycology,' by Mrs. Hussey, with 140 coloured plates; 4to.

induce dysentery here, is taken with impunity. Willdenow informs us that for some weeks he lived on Fungi and coarse bread, and enjoyed during the time the most excellent health. It is, however, certain that if the species were consumed indiscriminately, without the use of neutralizing condiments, there would be many fatal accidents. Even with care and knowledge, disasters may occur. Dr. Badham once suffered violently from simply tasting some of the spores of one of the milky Agarics which he had collected; and a fatal accident was nearly happening to one of his friends from eating accidentally a small piece of some Fly Agarics which had been sent by him with a view of making a decoction to poison flies. The schoolmaster in his parish was extremely ill on one occasion from mistaking the tarragon-scented *Agaricus Euosmus* for *A. ostreatus*, a species, it may be observed, scarcely worthy of being the subject of experiment.

Few species, however, have such virulent properties, and in general the taste or texture of dangerous species is such as render them unacceptable. The safest plan, where persons venture on experiments, is never to try any which have a disagreeable or forbidding smell, while those with a sweet or farinaceous odour are generally safe; never to use any species except when perfectly sound, and to take care that they are cooked in such a way as to secure their being tender and easy of digestion; and, above all, be their qualities what they may, always to partake of them with moderation. If these rules are attended to, and plenty of bread is eaten, there will be no fatal accidents; for it is presumed that those persons will abstain altogether from their use, with whose constitutions they never agree.

The common Mushroom, the Truffle, and Morel, are important articles of commerce, but more especially the first,

whether in a fresh state or in the form of ketchup. The extent to which this latter article is prepared is quite astonishing. A single ketchup-merchant has, at the moment at which I write, in consequence of the enormous produce of Mushrooms during the present season, no less than eight hundred gallons on hand, and that collected within a radius of some three or four miles. The price of Mushrooms for ketchup in country districts varies very greatly in different years. In the present year it has not reached, at least in the district in which I write, one penny per pound, while in some years as much as fivepence is readily given. In years of scarcity, almost any species that will yield a dark juice is without scruple mixed with the common Mushroom, and it should seem without any bad consequence, except the deterioration of the ketchup. The best ketchup, however, is made undoubtedly from the common Mushroom (*A. campestris*), and especially from that variety which changes to a bright red when bruised. That from *A. arvensis* (Plate 10, fig. 4) is far inferior. Good ketchup may be made from *A. procerus* and some others, and that from the Champignon is excellent, but so strong that it requires to be used with caution. Morels also, when abundant, yield, treated in the same way as Mushrooms for ketchup, an admirable condiment.

An important use is made of a particular condition of certain species of Mould in the preparation of fermented liquors, under the form of yeast. This consists, as is well known, of more or less oval bodies, which continually give off joints, so as to produce short, branched, necklace-like threads. These joints soon fall off, and give rise rapidly to a new generation, which is successively propagated till the substance is produced known under the name of yeast. When placed under proper conditions, the joints undergo a further change, and give rise

to two or three species of Mould. The effect of yeast seems to depend upon the fact that whenever there is an interchange of fluids on two sides of a living membrane, chemical change takes place, and thus there are millions of points, when the yeast-globules are diffused in the wort, at which fermentation is carried on. The same observation applies to bread. The different kinds of fermentation depend upon the degree of temperature to which the fermenting body is exposed. The globules of which yeast is composed retain their power of vegetation for months, and are capable of being preserved in a dry state, in which form they are largely imported under the name of German yeast. This compound is, however, somewhat capricious in its deportment. A sudden blow, for instance, is said to destroy its powers of germination. The spawn of Moulds assumes sometimes a fleecy form, and instead of globules consists of matted threads. In this state it is the well-known Vinegar-plant, which has an extraordinary effect in promoting acetic fermentation under proper conditions of temperature. Little at present is known of putrefactive ferments, but there is reason to believe that a third condition of Moulds, consisting of extremely minute bodies endowed with molecular motion, is conducive to the process.

The other uses to which Fungi are put are few, and mostly of little importance. The German tinder, or Amadou of commerce, so familiar to cigar-smokers, is made from the pileus of *Polyporus fomentarius*, beaten out and steeped in a solution of saltpetre. The pieces are often of considerable size, and when sewn together are sometimes fashioned into coarse garments. It is also used for Moxa. *Polyporus officinalis* was once extensively used in medicine as a purgative, but it is seldom employed now. The Jew's-car (Plate

18, fig. 7) and the false Truffle (Plate 23, fig. 3) are still sold in Covent Garden market, in consequence of some supposed healing properties, but they belong to the times of the ancient herbalists, when the doctrine of signatures was prevalent, and are rejected as useless by all respectable practitioners.

A few species of Fungi are used in Eastern Asia and Western Africa as medicines, but their use is mostly problematical. *Cordiceps sinensis*, when administered as stuffing to a roast duck, is said to have wonderful properties, but the strengthening quality resides probably in the savoury vehicle.

Ergoted grain, however, which owes its origin to a closely allied Fungus, is a most valuable medicine in the hands of the regular practitioner, though often grievously abused from its specific action on the womb. The peculiar principle upon which this depends is, I believe, unknown. Yeast is occasionally used with advantage as a dressing to foul ulcers, but whether it has any specific virtue, or whether benefit is derived from the carbonic acid gas evolved from the flour with which it is mixed, is perhaps uncertain. It has also been prescribed as an internal remedy.

*Polyporus igniarius*, when pounded, is used as snuff by the natives in the northern region of Asia. *Polysaccum crassipes* is employed in the south of Europe to produce a yellow dye. The Bloodrain, of which an account is given elsewhere, yields a vivid red, which is apparently permanent. Several species of Puff-ball, but especially the large *Bovista*, have anæsthetic properties when burnt, similar to those of chloroform. Operations have been successfully performed under its influence, and it is used for taking hives without the destruction of the bees. *Agaricus muscarius* is employed both in a fresh and dry state to produce intoxication, and more profitably in a de-

coction to destroy bugs and flies.\* *Polyporus betulinus*, when dressed, makes excellent razor-strops, probably from containing minute crystals hard enough to act upon the steel. When wood is impregnated with the spawn of *Peziza æruginosa*, it assumes a beautiful green tint. This is applied to various ornamental uses by the turners at Tunbridge Wells. Few people who admire it when manufactured, are probably aware to what it owes its attraction.

From the bright green produced in fairy-rings by the decayed Fungi of the last year's growth, it has been suggested that Fungi might form a valuable manure where they occur in great abundance. If collected for this purpose, they should be piled up with alternate layers of sand or light soil, to absorb their abundant moisture, exactly as is done in some districts with seaweed. It is, however, to be feared, that the result would not pay the expense, as the solid parts bear so small a proportion to the fluid. Water-weeds have been collected as manure within my own experience, but the waste was so great that they did not pay the expense of carting, though, from the quantity of animal matter which accompanies them, they promised well; and for the same reason it is to be feared, notwithstanding their richness in fertilizing matter, that Fungi may prove equally unprofitable.

\* For a singular account of its application to the purposes of intoxication, and the effects it produces, see Lindley's 'Vegetable Kingdom,' p. 38. A still worse abuse is made by the people in West Africa of the magnificent *Polyporus sacer*, who worship it, like some other natural objects, as a god.

## CHAPTER X.

## DISEASES CAUSED BY FUNGI.

FUNGI were long regarded as the mere creatures of putrescence, and therefore as the consequence, not the cause of disease. A more intimate acquaintance with their structure and habits has, however, removed much of this prejudice, and almost every one is now ready to acknowledge what a weighty influence they have in inducing diseased condition, both in the animal and vegetable world.

A large treatise\* has been written by Robin, relative to their effects on animals, and there are multitudes of scattered memoirs on the same subject; but, unfortunately, the Fungi which occur in the diseases of man, or other members of the animal kingdom, have seldom been examined by persons intimately acquainted with these Fungi, so that the species, or even genera in question, are often doubtful. It is, however, certain that many of those which are found on different parts of the mucous membrane of animals, in a more or less advanced stage of growth, are, like the Fungi of yeast, referable to common species of Mould. It is not probable that in

\* 'Histoire Naturelle des Végétaux Parasites qui croissent sur l'Homme et sur les Animaux vivants.' Paris, 8vo. 1853. Par Charles Robin.

these cases Fungi originate disease, though it is pretty certain that they frequently aggravate it. The spores of our common Moulds float about everywhere, and, as they grow with great rapidity, they are able to establish themselves on any surface where the secretion is not sufficiently active or healthy to throw off the intruder. Where the spores are very abundant, they may sometimes, like other minute bodies, obstruct the minute cells of the lungs, but there is no reason to believe that they induce epidemic diseases, such as cholera or influenza, according to an opinion once somewhat prevalent, whatever their abundance may be, or however easily they may be collected, as some assert, at the mouths of sewers, or in other situations likely to produce miasma.

One very curious production, known under the name of *Sarcina*, from its resembling minute woolpacks, is a pretty constant attendant on cancerous affections of the stomach, though not confined to them. Not only has it been found in certain secretions, but Dr. W. Tilbury Fox has discovered bodies which he cannot distinguish in severe cases of the skin affection called *Tinea tonsurans*. Dr. H. O. Stephens found an organism of precisely the same structure, though of a bright-orange, on imported bones, at Bristol; and Dr. Lowe found *Sarcina* in profusion in water in which he had placed some crystals of cholesterine. It is probable that this is a mere condition of some common Mould, but every attempt to make it germinate and produce its proper fruit has at present failed.

The influence of Fungi in the production of certain cutaneous disorders is now placed beyond all doubt. A few spores rubbed into the skin, or inserted in it, soon produce the disease known by the name of *Porriigo lupinosa*, and experiments have lately been made which tend to show that this imme-

diate influence is greater than has been generally suspected. Dr. Lowe has induced skin-diseases by inoculation with the granules of yeast, and he is inclined to attribute a great deal more to the agency of Fungi than has hitherto been allowed.\* An exact knowledge of their influence, whether externally or internally, meanwhile, is producing a better mode of treatment, such salts being administered with good effect as are fatal to fungal growth.

Fungi, perhaps, are more destructive to insects than to other members of the animal kingdom. Several species of the genus *Cordiceps*, as (Plate 23, fig. 4, 5) *C. militaris* and *entomorrhiza*, attack insects in the pupa or larva state, and, as it should seem, while they are still living. The insect-plant of New Zealand, which is so often brought home by travellers, is a familiar example. One species, indeed, in the West Indies, is developed on a perfect wasp, which flies about with it, till it is weighed down by its Sindbad, and dies. The fact was stated many years ago, and obtained but little credence; but I am assured by one who has had an opportunity of ascertaining the real state of the case, that it is strictly true. Silkworms suffer from a disease called Muscardine, from its converting them into a hard substance resembling a particular kind of pastile, and at the time of their death have their tissues completely traversed by the spawn of a *Botrytis*. A few spores placed lightly on the skin are sufficient to propagate the disease. Bees also, it is believed, occasionally die from a similar cause, but this requires confirmation.

It would be easy to multiply instances, were it necessary, but these are sufficient for my purpose. The diseases produced by Fungi amongst vegetables are far more formidable from the injury they cause in those plants which supply the

\* See 'Lancet,' Sept. 17, 1859.

staple food of man. Most of the Fungi which attack living vegetables belong to the lower Orders of the tribe. The spawn, however, of higher species is often fatal to trees and herbaceous plants, by running over the roots and inducing decay. It has been long known that trees would not in general flourish where others had grown before, and this was attributed to exhaustion of the soil; it is now, however, ascertained that the evil arises from spawn attached to old decaying roots. A most striking instance occurred lately in the Gardens at Kew. Two Deodaras were planted before the director's house, within a few yards of each other, under apparently similar circumstances. After a time, one of these became unhealthy, and it was suggested that the roots should be examined. A scrutiny in consequence took place, when it was found that an old cherry-tree formerly stood on the same spot, that its roots were covered with spawn, and that this had extended to the roots of the Deodara. The remains of the old cherry-tree were accordingly grubbed up, and the diseased portions of the Deodara removed, and now it bids fair to thrive without any further check. The effect is sometimes apparently so sudden, that it is attributed to lightning, the fact being that the exigencies of the plant have been supplied by a small portion of the roots which remained in a sufficiently healthy condition to convey nutriment. Herbaceous plants—as, for instance, strawberries—suffer from the same cause, and it is now matter of certainty, that wherever fragments of wood or sticks exist in manure, whether in the garden or field, there is considerable danger. The formidable Larch-rot, which converts the trunks of larches so frequently into hollow pipes, is often attributable to this cause.

Several Fungi, as *Polyporus squamosus*, and other species,

establish themselves on the previously diseased stems of trees. But though such Fungi do not attack healthy trees, their spawn soon spreads, and speedily destroys the surrounding healthy tissues. The evil can be stopped only by carefully cutting out the diseased parts, and washing them with a strong solution of corrosive sublimate, or other substance which may destroy the spawn without injury to the tree.

Of those which attack timber when converted to the purposes of marine and domestic building, the most formidable, perhaps, is Dry-rot (Plate 2, fig. 1), which derives its name from converting the wood into a dry powdery mass, though both the Fungus and wood are often sprinkled with large drops of moisture. This may, however, be prevented by previously impregnating the pores of the wood with gas-tar, sulphate of copper, or some other poisonous metallic salt; or, when established, may be greatly modified by careful, and, if needful, repeated washing with a saturated solution of corrosive sublimate. This treatment may not destroy the whole of the spawn, but if not, it will at least greatly diminish its vegetative power.

It is still a question amongst shipbuilders, whether winter or summer felled timber is most subject to be affected. It is quite certain that, in dry situations, timber felled when the trunk is most free from sap, is far more durable. There are many ancient buildings in which the sapwood is still as free from insects and decay as the firmest heartwood; but where there is not a free current of air, and Fungi can establish themselves, the mischief is so inherent in either case that it is only a question of time. In domestic buildings, where little choice is exercised in the selection of timber so long as it be of the proper size, and it has not to undergo the scrutinizing eye of a dockyard surveyor, the wood is often deeply impreg-

nated with spawn before it is used. This, indeed, is almost always the case where trees are grown from old stools, and not from seed. The foxy oak, so common in some districts, is almost entirely due to this cause; and I have seen such timber after a few years covered with Fungi to such an extent as to necessitate extensive repairs.

A large quantity of Fungi prey on the tissues of living leaves; the spawn of some of these runs over the surface; of some it creeps amongst the loose tissue of the under side of leaves; while in others it is more intimately incorporated with the firmer cells.

It is not easy to describe the two first apart, as different species of the same genus have different habits. The same, indeed, may be said occasionally of different individuals of the same species, but in either case they are capable of inflicting great injury. The Hop Mould, the Rose Mildew, the Vine Mildew, and a multitude of other allied Fungi, partly by feeding on the proper juices of the plant, and partly by clogging up the breathing pores, exhaust the plant and impede its circulation and respiration. Most of these will yield to sublimated sulphur, if timely and judiciously applied. The conditions under which these Fungi appear is very different. Some of them never perfect their true fruit, being propagated by a secondary fruit analogous to the reproductive buds of certain Phænogams, as *Begoniæ*. In some there are four or five distinct modes of propagation, and in consequence they spread with frightful rapidity. The cultivation of the Vine in Madeira has almost entirely ceased from this cause, and is very precarious everywhere. It is curious that this Fungus has never been found on the American Vines, or their numerous varieties, even when cultivated in Europe. The Isabella, for instance, a grape of American origin, has been always free

from Mildew. But though the varieties which are strictly American do not suffer, European kinds imported into the United States are frequently affected.\*

The Potato Murrain arises from a Mould of very different affinities, whose spawn attacks the tissues of the plant in every direction, being present in the tubers and stems, as well as in the leaves. It has a peculiar property of causing speedy decomposition of the tissues with which it comes in contact, and hence induces rapid—sometimes inconceivably rapid!—decay.

The sulphur remedy is not applicable here, because the spawn is never superficial, as in the Grape and Hop Mildew; nor at present do we know of anything which effectually checks its progress, though numberless plans have been suggested. Early planting, and destruction of the haulm as soon as the Fungus makes its appearance, give the best prospect of success.

The putrescence of Apples and other fruit is often promoted by a similar cause, as first pointed out by Dr. Hassall, who induced decay in perfectly healthy fruit by inoculation, but never apparently without some external lesion. A multitude of other Fungi, belonging to various genera, induce disease in leaves, as in the Mulberry, Vine and hundreds of other plants; but I cannot speak of these now, but must pass on to those species with loose dustlike fruit, which prey upon our cereals, and other objects of cultivation in the fields. The diseases produced by these are known under the name of Smut, Bunt, Mildew,\* Rust, etc., and are often extremely in-

\* It is unfortunate that the word Mildew (Mehl Thau, meal dew) should be applied to any Fungi besides the white Leaf Moulds. Its application to a particular disease of wheat is universally diffused, and cannot be checked, though constantly inducing error.

jurious. Some of these, as Smut and Bunt, attack the tissues of the seeds, their floral envelopes, or the receptacle in which the flowers grow, or, in rarer instances, the leaves and stems, converting them into a mass of loathsome, sometimes fetid dust; others, as Mildew and Rust, attack the leaves and stalks more especially, forming little rusty spots or streaks, and exhausting the plant by the growth of their spores and spawn at its expense. Sometimes they exercise a specific action upon the tissues, and cause the plant to assume various thickened or distorted forms analogous to those which are produced by the punctures of insects. Some of these, as Bunt, admit of easy extirpation,\* as the spores will not grow when treated by various chemical substances, and, as they are lighter than water, are in great measure removed by simply washing the seed. The others, as far as is at present known, admit of no remedy, though several nostrums are extensively sold under the pretence of preventing their growth.

There remains another Fungus productive of disease in the grains of rye, barley, wheat, and many field grasses, under the name of Ergot. The white substance of the seed is converted by this Fungus into a firm mass, without any appearance of meal, and when the Ergoted grain is sown, it produces a small species of *Cordiceps* (Plate 23, fig. 7), not unlike the species which attack insects.

\* Steeping the wheat in solutions of mineral salts, puddling it with quicklime stirred up in boiling water, and plain washing with water or brine, are amongst the means employed. The most efficacious, perhaps, is one used in France—viz. steeping the grain in a strong solution of Glauber's salt (sulphate of soda), and then dusting it with quicklime, the effect of which is to coat the seeds with sulphate of lime or gypsum, and to set free caustic soda for the destruction of the Bunt spores. Where solutions are used, the Bunted grains which have not been broken in threshing are skimmed off, and it is probable from the other practices, where the contents of the unbroken Bunts can scarcely be affected, that those spores of the Bunt only are injurious which are scattered over the Wheat.

Ergot, though useful from its medical properties, when prevalent in our fields causes cattle and sheep to slip their young; and when forming a large proportion in bread, especially in those districts where rye is much used, produces a fatal gangrene. This effect has at present been observed only in man, but it is probable that many diseases in cattle arise from eating it in seasons when it is peculiarly abundant. Though so powerful a drug in affections of the womb, it is at times largely eaten by children on the Continent, under the name of St. John's bread, without producing any evil effects whatever.\* It is observable that the same bad effects are sometimes produced by mouldy provisions which are produced by Ergot in bread. In countries where sausages are dried for winter use, and badly kept, mischief often arises, and the same effect has sometimes followed the use of a peculiar kind of rolled bacon. Whether this is attributable to some decomposition in the meat, or to the presence of Mould, is uncertain. The fatal cases which have occurred lately from the use of fresh sausages, induce one to believe rather in the latter notion, though unfortunately the data and the results of analysis have not been clear enough to enable one to form a safe opinion.

\* It should seem that gangrene is induced only where Ergot is used for some time continuously. Dreadful cases arise occasionally from the continued unauthorized use of solution of Ergot, to one of which I can myself bear testimony.

## CHAPTER XI.

## CULTIVATION OF FUNGI.

WERE Fungi objects of more general interest, there is little doubt that in skilful hands a great many species would admit of cultivation. At present, however, except under the care of a few inquirers into their mode of growth and fructification, attempts have been made to propagate a very few kinds only.

The three to which attention has been directed most are the Truffle\* (Plate 23, fig. 2), *Boletus edulis* (Plate 15, fig. 6), and the common Mushroom (Plate 10, fig. 2). A good deal has been written respecting the cultivation of Truffles, and one person even professed that he should soon have Truffle spawn for sale; but the treatises which have appeared have been, for the most part, mere catchpenny productions, while the experiments instituted have been generally ill-directed. In one case which promised a good deal, and of which I was invited to witness the result, it was found on inquiry that experiments had been made with the refuse Truffles of one of the Italian shops in London, which had been artificially dried, and which had therefore for the most part lost their powers of vegetation. But even in this case there were signs of the

\* These attempts have been confined principally to *Tuber melanosporum*, *estivum*, and perhaps *mesentericum*.

production of spawn, and, from what I saw of it, I felt almost assured that in better hands the cultivation would at last succeed. The grand point is to have plenty of lime in the soil, without which there is little, if any, hope of Truffles. A sort of cultivation is practised in Poitou, which consists in enclosing a tract of downs, and sowing it with acorns, and in the course of a few years a plentiful crop is almost uniformly the result. The Viscomte Noé, in the south of France, succeeded in raising Truffles in his woods by irrigating the ground, after a certain degree of preparation, with water in which the skins of Truffles had been rubbed. At present, however, no progress has been made in the garden, nor do gardeners seem inclined to persevere in their attempts, though success would be sure to be highly remunerative.

As regards *Boletus edulis*, which is so highly esteemed in many parts of the Continent, the only attempts which have been made at cultivation are similar to those of Viscomte Noé, and these have been attended with success. In either case pains were taken to fence out the wild pigs, which are the most deadly enemies to both Truffle and Boletus.

The cultivation of the common Mushroom is carried on to a very great extent wherever scientific gardening is practised, but nowhere to a greater than at Paris, where the Catacombs present all the requisite conditions. Mushrooms are generally raised from artificial spawn, which is purchased of the seedsmen, and inserted in fragments amongst mould carefully prepared and placed either on the ground or on convenient shelves; and, where proper attention is paid to the requisite degree of temperature and moisture, care being taken to exceed neither, the cultivation is almost always successful and very profitable. Some of the best cultivators, however, as Mr. Ingram at Belvoir, make use of nothing more than

straw which has been thoroughly trodden underfoot in the stable or riding-school. When this is placed in a heap, it is soon penetrated in every direction with spawn, and may be used in several ways for the production of Mushrooms. Splendid crops may be obtained from it, from Asparagus-beds, from mould in spent Cucumber and Melon-frames, either covered with green turf or exposed, as well as from the ordinary Mushroom-shed.

It has been questioned whether Mushrooms might not be raised successfully on lawns, and there is no doubt that this sort of cultivation would succeed. But even supposing it should, it must more or less interfere with the nice keeping of the surface, a point of so much consequence to English gardeners, which would inevitably exhibit here and there dead patches, the effects of the last year's growth. And if *A. arvensis* (Plate 10, fig. 4) should be chosen, which would probably be more easy of cultivation in such situations than any other species, the extent of dead surface would be considerable. There is another very great objection to the cultivation of this species, which is that the spawn at times gives out a most oppressive smell. During the last summer I was astonished at the very powerful odour which arose from the large rings of *Agaricus arvensis*, creating at once a sense of nausea. This, indeed, was so annoying, that even the labourers, whose perceptions of such matters are not in general very delicate, observed it. This observation applies also to the Champignon (Plate 14, fig. 5), which is one of the most eligible in other respects for lawn cultivation. The spawn of *A. arvensis* penetrates to a great depth, and Mrs. Hussey\* relates an instance where the scent was so overpowering,

\* The reader should refer to the article Fairy Rings, in Mrs. Hussey's 'Illustrations of British Mycology,' appended to her account of *Agaricus Oreades*.

that it was with great difficulty that the labourers who had to dig out a quantity of the spawn which had become a nuisance, could accomplish their task.

An esculent species of Agaric is raised at Naples by simply depositing a quantity of coffee-grounds in a warm cellar. No spawn is used, but the Fungus seems very generally to make its appearance after a certain time. Like most species which grow in such habitats, it is probably a mere state of some common form. A Polyporus used for food is raised in Italy from hazel-stumps, by simply charring them partially, and then supplying them with a proper quantity of water. Another species, *P. tuberaster*, springs up in Italy from conglomerated masses of earth and spawn, known by the name of *Pietra Fungaja*, or Fungus-stone, when placed in the conservatory; and I have seen specimens raised in Lec's garden, at Hammer-smith, from imported spawn. Attempts have been made to cultivate a fine variety of Mushroom from spawn imported from the Swan River. It is to be hoped that this may be tried again, and that *Agaricus fabaceus*, an American species, may also have another trial. A few species of Fungi occasionally make their appearance in the soil or on wood imported with exotic plants. I have seen, for instance, *Schizophyllum commune* in great abundance, accompanied by a pretty white *Marasmius*. The lovely *Marasmius hæmatocephalus* lately made its appearance at Kew, in a pot with a species of *Carludovica*; the curious *Aseröe* came up in the same establishment on Australian mould, and other species might be noticed of which I have specimens in my herbarium, and amongst these *Hypoxyylon marginatum*, an American species, which was observed in the conservatory at Chatsworth. These, however, are mere accidents, but they tend to show that many species might ornament our stoves from imported spawn, if their introduction was desired.

As regards matters of science or curiosity, the reproductive bodies of many Fungi can be made to germinate very readily by placing them in fluid in an insulated cell, or by simply putting them upon a slip of glass under an air-tight bell-glass. In cases where they do not germinate, there is some fault in general either in the temperature or degree of moisture; or sometimes because mere water is not sufficient, without an admixture of sugar or some other organic matter. Many species of Mould may be raised very easily upon paste made with ground rice under a bell-glass, and some Fungi may be brought to perfection on rotten wood in the same condition. The well-known Ergot may be induced to produce its very curious perfect form (Plate 23, fig. 7), by simply sowing the infected grains in a garden-pot, and avoiding extremes of dryness or moisture.\* Even some of the species which are parasites on living leaves may be propagated either by direct sowing of the spores on the young leaves, or watering the soil in which the plant proposed to bear the parasite grows, as in the case of the yellow Rose Rust, with water in which infected leaves have been duly steeped.

It may be stated, in conclusion of this Chapter, that *Polyporus igniarius* has been artificially raised in Germany, by merely collecting trunks impregnated with spawn, or likely to be so, and keeping them properly irrigated. Several crops have been obtained by this method in the course of the year.

\* Mr. Currey has induced the Ergot of the common Reed to fructify by keeping the stem immersed in water.

## CHAPTER XII.

## COLLECTION AND PRESERVATION OF FUNGI.

THE apparatus necessary for the collection of Fungi is neither large nor expensive. A large, oblong, shallow basket, without a lid, but with the bottom hollowed out a little at either end, a few tin boxes of various sizes, a stout, well-tempered knife, which will readily cut a good slice off a prostrate log, and a common magnifier, are all that is necessary. If Truffles are the object of search, a little rake in a leather case, which will screw into a handle, must also be provided. The basket should be shallow, that the specimens may not crush each other. Small and delicate species may be loosely wrapped in paper and secured in the smaller boxes, while in some which are very delicate, where it is necessary to avoid contact with the sides of the box, it is a good plan, if the Fungus grows on wood, to make the slice of wood very thin at one end, so that when the specimen is placed in the box, it may be secured by letting a portion of the thin end be grasped by the lid. The most delicate species may be safely conveyed in this manner, if a little tact is used.

Whoever wishes to arrive at an accurate knowledge of the natural productions of a country, will find that it is necessary to preserve specimens, that he may be able from time to time

to compare one with another. One great drawback which attends on the study of Fungi is the difficulty of preserving most of the larger and more important species in a state fit for examination. The difficulty is, however, not insurmountable, and with a little practice useful specimens may readily be prepared.

The harder species, such as the *Polypori*, etc., according to their size, may be dried between bibulous paper after the fashion of other plants, care being taken that the papers are changed with sufficient frequency. The larger species, which do not admit of this treatment except in the form of sections, may be simply placed in a warm, dry place, and when the moisture is well evaporated, the larvæ of any insects which may remain in them may be destroyed by a few minutes' submission to the heat of an oven, taking care, however, that it is not so hot as to scorch the specimens.

As regards the fleshy Fungi, it is better generally to adopt two plans:—first, to dry a few specimens between sheets of paper, made principally of cloth, after a little of their moisture has been evaporated by contact with the air. This, however, requires some care, to prevent decay from superabundant moisture. The other is to form careful sections of the different parts, so as to exhibit the several characters, removing from the pileus and stem the greater part of the substance. If too many species are not put together in the drying-papers, excellent specimens may be made in this way. The spores may be collected on white or black paper by merely placing a portion of the pileus with its hymenium upon it, and covering the whole for a few hours with a bell-glass.

The specimens, when dry, must be washed carefully with a solution of corrosive sublimate in pyroligneous naphtha, or some other solvent, taking care that it is such as will not

discolour the plants. Turpentine and corrosive sublimate may also be used, but as the corrosive sublimate is not soluble in it, the effect is uncertain. When the specimens are dry they should be glued to paper, which, if of the size mostly used for the herbarium, may be kept loose, but if of various sizes, as is perhaps most convenient, each slip of paper may be fastened with a *small* pin, so that several specimens may be included in one sheet. The slip should always bear some definite proportion to the sheet for convenience of arrangement. No portion of the herbarium requires more frequent inspection to prevent the ravages of mites and other insects; and, above all, the room in which the Fungi are placed must be free from damp, or the specimens, especially those which are dried without making sections, will be apt to mould. The great inconvenience about these is, that after a time, from the presence of some soluble salt, they are apt to vary with the weather as to their condition of dryness, and then the papers on which they are placed will be stained. At present I am not aware of any remedy for this inconvenience.

As, after all possible care, the colours, and many of the minuter characters, will be more or less impaired, it is advisable never to place a specimen within the papers for drying without at the same time making an accompanying note, giving such information about it as may serve to identify it. Without this, mistakes and perplexities will often arise, and a little care at first will grow into a habit, making it almost impossible to attempt to dry a specimen without a proper note. The commonest species will thus have its proper value, and will sometimes come into use, when it is least expected.

The *Myxogastres* are best preserved in the herbarium by fastening the specimens to the base of a neat shallow box, with a lid capable of being easily removed. If each box is

gummed to a slip of paper, exactly as if it were a specimen, and does not exceed a quarter of an inch in depth, no inconvenience will be found in the herbarium from its presence, and there will be no chance of the destruction of the plant, which it will be almost impossible to avoid by any other method.

## CHAPTER XIII.

## SYSTEMATIC ARRANGEMENT.

THIS has already been slightly sketched out, and the details may be reserved for the characters which follow of the genera of Fungi which occur in Great Britain, and the divisions under which they are arranged. It is impossible here to discuss the various arrangements which have been proposed. The one adopted is that which was given in Dr. Lindley's 'Vegetable Kingdom,' and which, as regards the principal groups, is almost identical with that of Fries. It may be objected that it rests on a single character, but in spite of this objection, I know of no arrangement which gives the true affinities of Fungi better, and if it be recollected that it is impossible to arrange any quantity of natural productions in a straight line so as to exhibit their relations, but that these may be illustrated rather by groups ranged round a common centre, bearing relations to the several groups which surround them, it will be seen, I think, that the arrangement does place together those species which are closely allied, though connected also with others in a contiguous group. Thus the *Uredines* pass through *Podisoma* into the *Tremellinæ*, and *Botrytis*, or *Sporotrichum*, through *Isaria* to *Clavati*. When the sporidia in an ascus are reduced to one, and the sac fits closely to the sporidium, the body so

formed is scarcely distinguishable from a spore, and we may then have a passage from the ascigerous Fungi to the sporiferous. It is thus that we have sometimes the two forms of fruit in the same hymenium, as in *Tympanis* (Plate 1, fig. 13).

I do not enter into the question of the affinities of Fungi with other groups, because it supposes a knowledge of those groups. I must refer, therefore, to what is said upon the subject in the 'Introduction to Cryptogamic Botany.'

As regards the affinities which exist between one group and another, we must take care that species are not placed together merely from similarity of external form. Nothing can be more close, for instance, than the external resemblance between a simple *Clavaria* and a *Geoglossum* (Plate 22, fig. 23), and yet no Fungi are more essentially distinct. So long as the true structure of the hymenium in the higher Fungi was unknown, they might be associated, but to associate them now would be to substitute analogy for affinity. Again, under similar circumstances, a *Psilopezia* and *Corticium* might be placed in the same genus, but the asci of the former indicate its alliance with *Peziza*, and not with *Auricularini*. On the contrary, the relation of *Hysterangium* to *Phallus*, though apparently so distant when the latter is expanded, is most evident if the young plant in the egg state be examined. And in the same way the relations of *Tremellini* to *Uredines* are clear, if the large, often lobed or septate cells from which the long threads which bear the spores are developed, be compared with the primary spores of *Podisoma*, while it is remembered that these spores give rise to little buds, whatever be their nature, from their sides, which are at the very least analogous with the tertiary spores of some *Uredineæ*. The transition from *Tremella* to *Thelephora* through such species as *T. sebacea* (Plate 17, fig. 6) is almost perfect.

In conclusion, it may be well to caution young students of Fungology against confounding galls with Fungi. The similarity of form which often exists between them is surprising, as if Nature delighted in reproducing the same form under circumstances so very different. Neither must he confound with Fungi the diseased hairs of leaves, which assume such a variety of forms and colours, with true epiphytes. These forms, indeed, are all registered by botanists under the genus *Erineum*, but they have no more pretence to be admitted amongst Fungi than oak-apples or oak-spangles.\*

\* Since the above was written, I have seen De Bary's paper on the production of asci in little swellings which occur on the gills of *Agaricus melleus*, after the white spores have fallen. This important observation requires further investigation; but even though it should turn out, which I do not think probable, that all Hymenomyces have a secondary form of fruit, the arrangement which follows would not cease to be natural, though the terms under which it is exhibited would require to be altered. See 'Botanische Zeitung,' 1859.

## FAMILY I.—HYMENOMYCETES.

Hymenium at length exposed, inferior in the higher species, consisting of closely packed cells, of which the fertile ones (*sporophores*) bear naked, mostly quaternate spores, on distinct spicules. Vegetation centrifugal.

ORDER 1. *AGARICINI*.

Hymenium inferior, spread over the surface of distinct gill-like processes, which are easily divisible into two plates.

1. *AGARICUS*, *L.*

Gills membranaceous, persistent (not melting); trama filamentous, continuous with the substance of the pileus; edge acute. *Fleshy putrescent Fungi.*

Series 1. *LEUCOSPORI*.—*Spores white.*

Subgenus 1. *AMANITA*.—Veil universal, distinct from the cuticle of the pileus. Hymenophorum distinct from the stem.

\* *Ring distinct.*

1. *A. (Amanita) vernus*, *Bull.*; white; pileus at first ovate, viscid, margin even; stem bulbous, closely embraced by the free limb of the volva; gills free.—*Bull. t.* 108.

In woods, early in the summer. Poisonous.

2. *A. (Amanita) Phalloides*, *Fr.*; pileus at first campanulate, viscid when moist; margin even, regular; volva free above, bulbous; gills rounded, ventricose. (Plate 3, fig. 1.)

In woods. Variously coloured, often greenish.

3. **A.** (*Amanita*) *muscaria*, *L.*; pileus convex, at length expanded, clothed with scattered warts, the remains of the adnate volva; flesh beneath the viscid cuticle yellow; margin striate; stem bulbous, scaly at the tubercous base, stuffed with cottony threads; gills reaching the stem and forming decurrent lines upon it.—*Grev. t.* 54; *Huss. i. t.* 1.

In woods, especially of birch. Mostly of a bright scarlet, but sometimes umber, etc. Warts white or yellow. Poisonous.

4. **A.** (*Amanita*) *pantherinus*, *DC.*; pileus convex, then expanded, margin striate; flesh white beneath the viscid cuticle; stem nearly smooth, furnished at the base with a volva the extreme entire obtuse margin of which alone is free.—*Kromb. t.* 29. *f.* 10–13.

In woods or in pastures, near trees. Supposed to be poisonous. Brownish, not red or reddish-brown like the last.

5. **A.** (*Amanita*) *strobiliformis*, *Fr.*; pileus convex, then expanded, studded with persistent warts; flesh compact, white; margin even; stem bulbous, the base subterraneous, rough with the remains of the volva; ring torn; gills rounded behind and free. (Plate 3, fig. 2.)

Borders of woods. Rare, attaining a large size. Esculent.

6. **A.** (*Amanita*) *Mappa*, *Batsch.*; pileus convex, at length plane, without any separable cuticle; margin nearly even; flesh white; stem nearly smooth, bulbous below; free edge of volva acute and narrow; gills adnexed.—*Vitt. t.* 11.

Under trees. Colour various. Habit like that of a small *A. Phalloides*; edge of volva somewhat like that of *A. pantherinus*. Poisonous.

7. **A.** (*Amanita*) *rubescens*, *P.*; pileus convex, then expanded, at first clothed with scattered mealy warts; margin striate; whole plant becoming red when bruised; ring entire; stem attenuated upwards, squamulose; gills reaching the stem

and forming decurrent lines upon it; volva obliterated.—*Huss.* i. t. 23.

In woods, very common. Known by its reddish colour when rubbed. Quality doubtful.

8. **A.** (*Amanita*) *excelsus*, *Fr.*; pileus convex, at length plane, at first innato-fibrillose, clothed with irregular mealy warts, which soon vanish; margin nearly even; flesh white; stem bulbous, scaly below; gills free, rounded behind; volva evanescent. (Plate 3, fig. 3.)

In woods. Supposed to be poisonous. Margin sometimes sulcate. Brownish.

9. **A.** (*Amanita*) *asper*, *P.*; pileus at first convex, rough with minute subpersistent warts; flesh brownish beneath the cuticle; margin even; gills rounded behind, free.—*Vitt.* t. 43.

In woods. Resembling in many respects *A. rubescens*.

10. **A.** (*Amanita*) *megalodactylus*, *Berk. and Br.*; strong-scented; pileus soft, convex, smooth, reddish-grey; cuticle entire; margin even; stem somewhat bulbous, solid, fibrillose; ring very large, placed near the top of the stem; gills moderately broad, free, pallid, at length tinged with red.

In a wood at Wothorp, near Stamford. Pileus  $3\frac{1}{2}$  inches across, stem 5 inches high. Allied to *A. lenticularis*, but the solid stem is not squamulose, and the gills do not assume an olive tint.

\*\* *Ring none.*

11. **A.** (*Amanita*) *vaginatus*, *Bull.*; pileus thin, at first campanulate, then nearly plane; margin deeply sulcate; stem flocculoso-squamose, fistulose; volva sheathing, loose; gills free, at first white. (Plate 1, fig. 4.)—*Huss.* ii. t. 34.

In woods and under trees; very common. Varying greatly in colour, size, and breadth of the volva. *A. nivalis*, *Grev.*

t. 18, is a pure-white variety, with an expanded volva, and is by no means confined to mountain pastures.

12. **A. (Amanita) Ceciliae**, *Berk. and Br.*; pileus at first ovate, then campanulate, clothed with scattered subpersistent warts; margin grooved; stem stuffed, silky above, squamulose below; volva soon breaking up. (Plate 3, fig. 5.)

In woods. Mouse-grey. Distinguished by its less perfect volva and stuffed stem, which does not simply contain a few cottony fibres, as that of *A. vaginatus*.

Subgenus 2. **LEPIOTA**.—Veil universal, concrete with the cuticle of the pileus. Hymenophorum distinct from the stem.

\* *Cuticle dry.*

a. *Ring moveable.*

13. **A. (Lepiota) procerus**, *Scop.*; pileus fleshy, at first ovate, then expanded and umbonate; cuticle thick, torn up into scales; stem tall, hollow, bulbous, variegated with close-pressed scales; ring moveable; gills very remote.—*Vitt. t. 24. Huss. i. t. 88.*

Pastures. Often several inches across. Esculent. Sold in Covent Garden market.

14. **A. (Lepiota) rachodes**, *Vitt.*; pileus fleshy, at first globose, then expanded and depressed; cuticle thin, broken up into persistent scales; stem hollow, not spotted; bulb at first abrupt, ring moveable; gills remote. (Plate 3, fig. 6.)—*Huss. ii. t. 38.*

In shady pastures. Flesh mostly red when bruised; not so good for food as the last, if really wholesome. Intermediate forms occur, which it is difficult to refer to either species.

15. **A. (Lepiota) excoriatus**, *Schæff.*; pileus fleshy, obscurely umbonate; cuticle thin, breaking up into patches; stem short, hollow, cylindrical, even, nearly white, slightly

bulbous; ring moveable; gills rather remote.—*Schæff. t.* 18, 19.

In pastures. Far smaller than the two foregoing.

16. **A.** (*Lepiota*) *gracilentus*, *Kromb.*; pileus somewhat fleshy, obtusely umbonate; cuticle thin, breaking up into adpressed persistent patches; stem hollow, elongated, slightly bulbous; ring thin, free, evanescent; gills remote, at length pallid.—*Kromb. t.* 24. *f.* 13, 14.

In pastures, Laxton, Northamptonshire. Resembling *A. procerus*, but more delicate.

17. **A.** (*Lepiota*) *mastoideus*, *Fr.*; pileus somewhat fleshy, strongly and acutely umbonate; cuticle thin, breaking up into scattered papillæ; stem hollow, equally attenuated from the bulb, weak; ring evanescent, moveable; gills very remote, pallid.—*Berk. in Mag. of Zool. and Bot.* i. *t.* 2. *f.* 1.

In woods, King's Cliffe. In my plant the stem is minutely villososquamose. Fries describes it as smooth and even.

#### b. *Ring fixed.*

18. **A.** (*Lepiota*) *acutesquamosus*, *Weinm.*; pileus obtuse, fleshy, rough with erect acute squarrose scales; stem below the ring rough like the pileus, or silky, bulbous, pruinose above; gills lanceolate, approximate.—*Huss. ii. t.* 5; *Kromb. t.* 1. *f.* 18, 20. *A. Mariæ*, *Eng. Fl.* *A. asper*, *Abbildungen der Schw.*

On soil in gardens. Generally of a tawny tint; very beautiful.

19. **A.** (*Lepiota*) *Badhami*, *Berk. and Br.*; pileus at first campanulate, obtuse, then expanded or depressed and umbonate hispid, with minute velvety ermine-like scales; stem bulbous, white, silky, stuffed with cottony threads; ring firm, slightly moveable; gills remote, ventricose; whole plant, when wounded, of a saffron-red.

Under Yew-trees, Apethorpe, Northamptonshire. Pileus 2-4 inches across; allied to *A. clypeolarius*, but more robust. Smell rather disagreeable.

20. *A. (Lepiota) clypeolarius*, *Bull.*; sweet-scented; pileus fleshy, umbonate, at first clothed with an even crust, at length broken up into floccose scales; stem fistulose, with the evanescent ring floccoso-squamose; gills free, approximate.—*Bull. t.* 405, 506. *f.* 2.

In woods and in hothouses. Varying greatly in colour, white, yellow, pink, rufous, brown, etc.

21. *A. (Lepiota) cristatus*, *Fr.*; strong-scented; pileus slightly fleshy; cuticle at first continuous, naked, then broken up into scales; stem slender, fistulose, even; ring entire, evanescent; gills free, at length remote. (Plate 3, fig. 7.)—*Huss. i. t.* 48.

In fields, lawns, etc. Very common. Pretty, and remarkable for its strong scent. Several varieties occur in hothouses.

22. *A. (Lepiota) Vittadini*, *Moretti*; pileus fleshy, obtuse, rough with strong wart-like scales, as is also the stout solid stem; ring large; gills ventricose, thick, free.—*Huss. i. t.* 85.

In pastures. Rare. Norfolk, Northamptonshire, Huntingdonshire, etc. A large species, of a pure white; extremely beautiful.

23. *A. (Lepiota) naucinus*, *Fr.*; pileus soft, fleshy; cuticle entire, or breaking up into granules, somewhat umbonate and even in the centre; stem stuffed, attenuated upwards; ring large, at length evanescent; gills pallid, free, approximate; spores very large.—*Kromb. t.* 24. *f.* 20-23.

In fields. Tunbridge Wells, *F. Currey*, whose specimens are of a delicate tan, the gills at length assuming a dirty-pink hue. The large white spores are very characteristic. It may be confounded very easily with *A. cretaceus*.

24. A. (*Lepiota*) *cepæstipes*, *Sow.*; pileus submembraneous, at first ovate, then expanded, mealy and scaly, widely umbonate; margin plicate; stem hollow, floccose, thicker in the middle or at the base; ring evanescent; gills at length remote.—*Grev. t.* 333; *Sow. t.* 2.

On tan and leaves in hothouses. White or yellow; the stem varies in form. Sowerby's plant has white spores, like Greville's. The species is probably of exotic origin, as it never grows in the open air. It is uncertain whether the plant with an equal stem which often grows in similar situations is the same species.

25. A. (*Lepiota*) *granulosus*, *Batsch.*; pileus fleshy, at first convex, then expanded, mealy with innate granules; stem rough, like the pileus below the narrow ring; gills crowded, free, white.—*Grev. t.* 104; *Huss. i. t.* 45.

In woods and on heaths. White, pink, vermilion, yellow, etc. Always easily distinguished by its mealy, granular aspect.

26. A. (*Lepiota*) *polystictus*, *Berk.*; inodorous, fleshy; cuticle continuous or broken into scales; stem attenuated downwards, stuffed with cottony threads, scaly below the fugacious ring, silky above; gills crowded, rounded before and behind, free, white, with a pale-yellow tinge.

Amongst short grass, by roadsides. Northamptonshire and Denbighshire. Stem pinkish above the ring; pileus  $1\frac{1}{2}$  inch across.

\*\* *Pileus viscid.*

27. A. (*Lepiota*) *gliodermus*, *Fr.*; pileus thin, soft, campanulate, convex, smooth, even, rufous, viscid; stem whitish, floccoso-squamose, stuffed with cottony threads; ring torn; gills free, white, approximate.

In woods. Rare. Wothorp, near Stamford. Pileus  $1\frac{1}{2}$  inch across.

Subgenus 3. *ARMILLARIA*.—Veil partial, annular. Hymenophorum confluent with the stem.

28. *A. (Armillaria) ramentaceus*, *Bull.*; pileus fleshy, obtuse, dry, villososquamose; stem solid, unequal, scaly; ring inferior, made up of woven floeci; gills emarginate, crowded, whitish, at length discoloured.—*Bull. t. 595. f. 3.*

On the ground. Not common. King's Cliffe. Whitish or yellowish, scales brown, odour unpleasant. Known from cognate *Tricholomata* by its ring.

29. *A. (Armillaria) constrictus*, *Fr.*; pileus fleshy, at first convex, obtuse, even, dry, smooth, with an evanescent silky lustre; stem solid, nearly equal; ring superior, evanescent; gills crowded, emarginate.—*Batt. t. 7 B.*

In pastures where the ground is bleached with urine. Rare. Northamptonshire. Pure white; odour very strong, like that of fresh meal. The ring in my specimens is wanting. (See *Eng. Fl. vol. v. part 2, p. 11.*)

30. *A. (Armillaria) melleus*, *Vahl*; pileus fleshy, at length plane, clothed with fibrous scales; margin striate; stem elastic; ring floecose; gills ending in a decurrent tooth, pallid, at length mealy from the white spores, and spotted with reddish-brown. (Plate 4, fig. 1.)

On dead stumps. Very common. Pale-rufous, more or less shaded with yellow, densely cæspitose. Acrid when raw, but eaten on the Continent. Sometimes, like the last, ringless. *Agaricus laricinus*, Bolton, is probably only a variety of this species.

31. *A. (Armillaria) mucidus*, *Fr.*; pileus thin, convex, glutinous; stem rigid, thickened at the base; ring superior,

deflexed, with the margin erect; gills rounded, distant, striato-decurrent, white.

On beech. Southern counties. Pure white, or with a cinereous tinge. Very beautiful. Two inches or more across.

Subgenus 4. *TRICHOLOMA*.—Stem fleshy; gills with a sinus behind. Veil obsolete, or, if present, floccose, and adhering to the margin of the pileus.

\* *Pileus either viscid, squamulose, fibrillose, or pubescent.*

32. **A.** (*Tricholoma*) *equestris*, *Linn.*; pileus yellow, inclining to reddish, fleshy, compact, obtuse, squamulose, viscid; stem solid, blunt, sulphur-coloured, as well as the free crowded gills. (Plate 4, fig. 2.)

Amongst fir-leaves. Rare. East Bergholt, *Dr. Badham*.

33. **A.** (*Tricholoma*) *sejunctus*, *Sow.*; pileus fleshy, convex, at length expanded, umbonate, unequal, slightly viscid, streaked with black fibres; stem stout, solid, ventricose, subsquamulose; gills emarginate, rather distant, broad, white.—*Sow. t.* 126.

Pileus several inches across. I am not acquainted with this species.

34. **A.** (*Tricholoma*) *portentosus*, *Fr.*; pileus fleshy, convex at first, subumbonate, unequal, viscid, streaked with black innate lines; stem stout, solid, equal, striate; gills very broad, emarginate, white, at length distant and pallid.

In woods. King's Cliffe. Closely resembling the last.

35. **A.** (*Tricholoma*) *fucatus*, *Fr.*; pileus thin, at first conical, then convex and expanded, viscid, streaked with innate lines; disc fleshy; stem solid, somewhat bulbous, squamulose; gills emarginate, rather crowded, tinged with yellow.

In pine-groves. Closely allied to *A. portentosus*. Pileus shining when dry, often dingy. The thin pileus, squamulose

subbulbous stem, and yellowish gills, are its principal differences.

36. **A.** (*Tricholoma*) *spermaticus*, *Fr.*; white; pileus somewhat fleshy, at first convex, then expanded, smooth, viscid; margin membranaceous, naked; stem stuffed, at length hollow, twisted, even; gills emarginate, rather distant, eroded.—*Paul. t.* 45.

In fir-woods. Coed Coch, Denbighshire, October 13, 1859. Smell strong, unpleasant. Pileus several inches across.

37. **A.** (*Tricholoma*) *nictitans*, *Fr.*; pileus fleshy, convexo-plane, obtuse, even, smooth, viscid; stem stuffed, dry, elastic, nearly equal, squamulose, yellow, as well as the crowded obsoletely spotted gills, which from the first are rounded behind and free.—*Bull. t.* 574. *f.* 1; *Huss. ii. t.* 46.

In woods. East Bergholt, *Dr. Badham.*

37\*. **A.** (*Tricholoma*) *fulvellus*, *Fr.*; pileus fleshy, convexo-plane, viscid, even, disc darker, punctato-rugose; stem stuffed, then hollow, fibrillose, at length rufous, tip naked; gills crowded, white, at length rufous, rounded, then emarginate.—*Bull. t.* 555. *f.* 2.

In woods. Coed Coch, October 1859. Fries considers this merely a subspecies.

38. **A.** (*Tricholoma*) *flavo-brunneus*, *Fr.*; pileus fleshy, at first conical, at length expanded, viscid, clothed with little streak-like scales; stem hollow, somewhat ventricose, fibrillose, at first viscid, tip naked; gills emarginato-decurrent, crowded, yellowish, becoming rufous.

In woods. Not uncommon. Smell like that of new meal. Schæffer's *t.* 62, quoted under this by Fries, appears to be *Ag. melleus*.

39. **A.** (*Tricholoma*) *albo-brunneus*, *P.*; pileus fleshy, hemispherical, obtuse, viscid, streaked; stem solid, short, equal,

white, and squamulose above; gills emarginate, crowded, white, at length tinged with brown.—*Sow. t.* 416.

In woods. Not uncommon. Smell like that of new meal.\*

40. **A.** (*Tricholoma*) *rutilans*, *Schæff.*; pileus fleshy, dry, variegated as well as the stem with purple down; gills rounded, crowded, yellow, edge thickened, villous.—*Sow. t.* 31.

On pine-stumps. Very common. Easily distinguished by its yellow gills and purple down. Often extremely beautiful.

41. **A.** (*Tricholoma*) *luridus*, *Schæff.*; pileus fleshy, dry, smooth, undulated, at length breaking up into little fibres; stem stout, stuffed, unequal, smooth; gills emarginate, crowded, dirty white.—*Schæff. t.* 69.

In woods. Common. Smell like that of new meal. (See description in 'English Flora.')

Distinguished from 34 and 35 by its dry pileus, and other notes.

42. **A.** (*Tricholoma*) *Columbetta*, *Fr.*; white; pileus fleshy, at first ovate, moist, obtuse, rigid, at first smooth, then more or less silky or squamulose; margin involute, at first downy; stem stout, solid, unequal, striate, nearly smooth; gills crowded, emarginate, thin, somewhat serrated.—*Kromb. t.* 25. *f.* 6, 7.

In woods. Coed Coch, Oct. 1859. Edgbaston, *Withering*. Very like *A. albus*, but that has a smooth pileus.

43. **A.** (*Tricholoma*) *imbricatus*, *Fr.*; pileus fleshy, compact, at first convex, obtuse, dry, innato-squamulose; margin at first inflexed, pubescent; stem stout, solid, pruinose above; gills emarginate, adnexed, rather crowded, at length rufous. (Plate 4, fig. 3.)

\* Besides the above Nos. 38, 39, I find a species on the borders of fir-woods without the scent of new meal, with the following characters. Pileus umbonate, dark red-brown, sometimes minutely squamulose, but scarcely streaked; stem solid at first, then hollow, mealy and white above, fibrillose below; gills emarginate, with a decurrent tooth. Further study will alone show whether this is a distinct species.

In fir-woods. Taste mild. Stem stuffed, at length hollow.

44. *A. (Tricholoma) vaccinus, P.*; pileus fleshy, at first campanulate, umbonate, dry, rough with floccose scales; margin involute, tomentose; stem hollow, equal, fibrillose; gills fixed, rather distant, at length rufous.

In fir-woods. East Bergholt, *Dr. Badham*. Nassington, Northamptonshire. Taste disagreeable.

45. *A. (Tricholoma) crassifolius, Berk.*; pileus fleshy, waved, minutely adpresso-squamulose, umbonate, ochraceous; disc umber; stem solid, nearly equal, pruinose; gills thick, moderately distant, nearly free, at length yellowish, stained with brown.

In fir-woods. Winkbourn, Notts. Pileus 2-4 inches across. Smell rather strong.

46. *A. (Tricholoma) murinaceus, Bull.*; pileus thin, firm, brittle, at first campanulate, then expanded, cracked, streaked, silky, dry; stem stout, cracked, and streaked with minute black scales, solid; gills very broad, undulated, distant, more or less anastomosing, brittle, cinereous, often marked with raised lines; edge at length black.—*Sow. t.* 106.

In woods. Not common. Taste bitter, unpleasant; odour not nitrous. Not an *Hygrophorus*, and very different from *H. murinaceus*, Fr.

47. *A. (Tricholoma) terreus, Schæff.*; inodorous; pileus fleshy, soft, at first campanulate, dry, umbonate, clothed with innate floccose or scaly down; stem stuffed, nearly equal, dirty white, adpresso-fibrillose; gills adnexed, with a decurrent tooth, crenulate, pale grey.—*Sow. t.* 76.

In woods, especially fir-woods. Common. This species varies, with white and yellowish gills. *A. millus*, Sow., is a form of this, or of one of the following species.

48. **A.** (*Tricholoma*) *sculpturatus*, *Fr.*; pileus fleshy, at first subconical, broken up into floccose, umber or rufous scales; stem stuffed, unequal, white, fibrillose; gills emarginate, rather crowded, quite entire, white, becoming yellowish.—*A. argyraceus*, *Eng. Fl. (pro parte.)*

Fir plantations, borders of woods, etc.

49. **A.** (*Tricholoma*) *saponaceus*, *Fr.*; strong-scented, firm; pileus rather compact, at first convex, obtuse, dry, smooth, then rimoso-squamose or dotted; margin from the first naked; stem solid, unequal; gills uncinato-emarginate, distant, thin, quite entire, changing from white to pallid, sometimes greenish.—*A. argyraceus*, *Eng. Fl. in part*; *Bull. t. 602.*

In woods. This species, *A. sculpturatus*, and *A. ramentaceus*, which latter differs in the presence of a ring, are all included in the 'English Flora' under the name of *A. argyraceus*. *A. graveolens*, *Sow.*, must be sought for under *A. gambosus*.

50. **A.** (*Tricholoma*) *meleagris*, *Sow.*; pileus fleshy, thin, convex, then plane; cuticle broken up into black scales; flesh turning red; stem solid, squamulose, thickened downwards, and black, solid; root reticulated; gills nearly free.—*Sow. t. 171.*

On hotbeds. Not sufficiently known. Intermediate in characters between *Lepiota* and *Tricholoma*, but apparently destitute of a veil.

51. **A.** (*Tricholoma*) *cartilagineus*, *Bull.*; cartilaginous, elastic, rather brittle; pileus fleshy, convex, gibbous, undulated, smooth; cuticle rimulose, finely dotted with black; stem stuffed, equal, stout, lincato-striate, somewhat mealy; gills slightly emarginate, adnexed, crowded, pallid.—*Bull. t. 589. f. 2.*

In grassy spots. East Bergholt, *Dr. Badham*. Nov. 1855. Smell like that of new flour.

52. **A.** (*Tricholoma*) *cuneifolius*, *Fr.*; extremely brittle; pileus smooth at first, but soon cracked; stem hollow, attenuated downwards, pruinose above; gills thin, crowded, white, broad in front, obliquely truncate, attenuated behind, with a decurrent tooth.—*Bull. t.* 580 *A, B.*

In pastures. Not uncommon. About one inch across. Surface of the pileus rufous where not broken up; stem white. Smell like that of new meal.

53. **A.** (*Tricholoma*) *sulfureus*, *Bull.*; strong-scented; pileus fleshy, unequal, subumbonate, at first slightly silky, then smooth and even; stem stuffed, nearly equal, slightly striate, sulphur-coloured, as well as the distant gills. (Plate 4, fig. 4.)—*Sow. t.* 44.

In woods. Common. Smell like that of gas-tar, or *Hemerocallis flava*.

54. **A.** (*Tricholoma*) *bufonius*, *P.*; strong-scented; pileus fleshy, subumbonate, at first slightly silky, then smooth, opaque, punctato-rugose; stem stuffed, nearly equal, flocculose; gills arcuato-subdecurrent, rather distant, of a yellow-tan colour.—*Bull. t.* 545. *f.* 2, *C.*

In pine-woods. Coed Coch, *Mrs. Wynne*. Pileus purplish, brownish, tan-coloured, etc.

55. **A.** (*Tricholoma*) *lascivus*, *Fr.*; pileus fleshy, obtuse, somewhat depressed, at first silky, then smooth and even; stem solid, equal, stiff, rooting and tomentose at the base, white, as well as the close arcuate adnexed gills.

In woods. Canterbury. Smell like that of the two last. Pileus pale-tan; flesh white.

56. **A.** (*Tricholoma*) *inamœnus*, *Fr.*; strong-scented; pileus fleshy, somewhat umbonate, slightly silky at first, then smooth and even; stem solid, rooting, white, as well as the very distant arcuato-affixed and decurrent gills.

In woods. Not uncommon. Pileus white, with a slight tinge of ochre, often minutely cracked. Stem not always rooting. Smell like that of the last.

57. *A. (Tricholoma) immundus*, *n. s.*; caespitose, fleshy; pileus at first convex, dirty white, stained with bistre, minutely silky; margin inflexed, silky or minutely scabrous and squamulose; stem fibrillose, of the same colour as the pileus; gills subcinereous, with a pinkish tinge, marked with transverse lines, emarginate.

Amongst short grass, on sheep's dung. On the top of Moelfre-uchaf, Denbighshire, Oct. 1859. Pileus 2 inches or more across. Every part blackish when bruised. Border deflexed; spores white. Fries, to whom specimens were sent, compares this with *A. gangraenosus* and *A. graveolens*, but it seems distinct from either. The figure of *A. fumosus*, Pers. Ic., gives some notion of its outward appearance.

58. *A. (Tricholoma) ionides*, *Bull.*; pileus fleshy, at first campanulate, umbonate, even, nearly smooth, changing colour; margin at first flocculose; stem stuffed, elastic, attenuated, fibrillose; gills crowded, emarginate, with a decurrent tooth, thin, eroded, white, at length discoloured.—*Bull. t. 533. f. 3.* *A. purpureus*, *Bolton, t. 41.*

In woods. Not found since the time of Bolton.

59. *A. (Tricholoma) carneus*, *Bull.*; pileus slightly fleshy, obtuse, even, nearly smooth, becoming pallid; stem short, stuffed, rigid, reddish like the pileus, thickened upwards, pruinose; gills very wide behind, rounded, crowded, white.—*Bull. t. 533. f. 1.*

In pastures. Not uncommon. Pileus seldom exceeding 1 inch, of a rufous pink. Stem minutely squamulose, often splitting, at length hollow.

\*\* *Moist or watery (hygrophanous). Veil, if present, fugitive, pulverulent.*

60. A. (*Tricholoma*) *gambosus*, *Fr.*; pileus very thick and fleshy, at first convex, obtuse, at length undulated, moist, smooth, spotted, at length cracked; margin involute, at first flocculose, as well as the tip of the stout solid stem; gills emarginate, with a little adnexed tooth, crowded, ventricose, yellowish-white. (Plate 4, fig. 5.)—*Sow. t.* 281; *Huss. i. t.* 83.

In pastures. May, June. Pileus white, or slightly tinged with ochre. Growing in rings. Eatable, and much approved by many. Varying considerably in size. Smell strong, like that of *Polyporus squamosus*. Sowerby's *A. graveolens* is this species, as appears from his private notes. The true *A. Georgii*.

61. A. (*Tricholoma*) *monstrosus*, *Sow.*; pileus fleshy, at first convex and umbonate, at length waved and lobed, opaque as if whitewashed; margin inflexed; stem compressed, solid, streaked, opaque white, tomentoso-squamulose above, slightly rooting; gills moderately distant, scarcely rounded behind, but not truly decurrent, cream-coloured.—*Sow. t.* 283.

On the ground. Jedburgh, *A. Jerdon, Esq.* Near Norwich, *Sow.* Often densely caespitose, and then not compressed. This cannot be *A. borealis*, *Fr.*, as the pileus is always white. In Sowerby's figure it should be observed that the gills are represented as distinctly rounded. Probably esculent.

62. A. (*Tricholoma*) *albellus*, *DC.*; pileus smooth, at first conical, moist, spotted after the fashion of scales; disc compact, subumbonate; margin thin; stem solid, ovato-bulbous, fibrilloso-striate; gills crowded, entire, white, attenuated behind and adnexed, without any tooth, broader in front.—*Sow. t.* 122.

Not found in Great Britain since the time of Sowerby, whose specimens—which are connato-cæspitose and convex, not conical—belong to the smaller variety. Esculent. The specific character applies to the larger variety. Sowerby's plant is simply discoloured when bruised.

63. **A.** (*Tricholoma*) *albus*, *Fr.*; pileus fleshy, at first convex, obtuse, smooth, even, dry; margin at first involute, at length repand; stem firm, solid, elastic, equal, or attenuated below, smooth; gills rounded behind, fixed, thin, crowded, broad, white. (Plate 4, fig. 6.)—*Bull. t.* 536.

In woods. White, or shaded with yellow. Variable in size.

64. **A.** (*Tricholoma*) *personatus*, *Fr.*; pileus at first compact, then soft, convex, obtuse, even, smooth, moist; margin at first involute, villosopruinose; stem solid, blunt, somewhat bulbous, villous, stained with lilac; gills rounded behind, at length free, dirty white. (Plate 5, fig. 1.)—*Huss. ii. t.* 40.

In pastures. Common. Sold in Covent Garden as eatable, but has been supposed to be occasionally dangerous. Varying a little in colour, but generally cinereous, and sometimes confounded carelessly with *Cortinarius violaceus*. Bright-coloured specimens are sometimes difficult to distinguish from the next.

65. **A.** (*Tricholoma*) *nudus*, *Bull.*; pileus rather thin, obtuse, smooth, moist, changing colour; margin inflexed, thin, naked; stem stuffed, elastic, rather mealy; gills rounded behind, then decurrent, crowded, narrow, violet, stained when old with reddish-brown. (Plate 4, fig. 7.)

In plantations, woods, etc., especially amongst pines. Smaller than the last, and brighter-coloured.

66. **A.** (*Tricholoma*) *acerbus*, *Bull.*; pileus fleshy, convex, obtuse, smooth, rather spotted; margin thin, strongly

involute, sulcate; stem solid, blunt, yellowish, squamulose above; gills crowded, emarginate, pale, then rather rufous.—*Bull. t. 571. f. 2.*

In woods. Not common. King's Cliffe. Suffolk, *Dr. Badham*. Pileus 3–4 inches across; white, tinged with yellow, at length stained. A very fine species.

67. A. (*Tricholoma*) *cinerascens*, *Bull.*; pileus fleshy, convex, obtuse, smooth, even; margin thin, naked, striate; stem stuffed, elastic, nearly equal, smooth; gills crowded, rounded behind, somewhat undulated, easily separating from the pileus; white, then discoloured.—*Bull. t. 428. f. 2.*

In woods. Not uncommon. Four inches across, white, slightly shaded; gills at length tinged with reddish-brown or yellow; spores white. Smell unpleasant.

68. A. (*Tricholoma*) *grammopodium*, *Bull.*; pileus fleshy, at first campanulate, convex, then expanded and depressed, umbonate, smooth, moist; stem stuffed, elastic, sulcate, smooth, attenuated upwards; gills arcuate, adnate, crowded, white.—*Bull. t. 548, 585. f. 1; Huss. ii. t. 41.*

In pastures, forming rings. Large, brownish-grey. Bolton's t. 40 probably belongs to this species.

69. A. (*Tricholoma*) *melaleucus*, *P.*; pileus thin, fleshy, convex, at length plane, obsoletely umbonate, smooth, moist, changing colour; stem stuffed, thin, elastic, nearly smooth, dirty, sprinkled with a few fibrils, thickened at the base; gills emarginate, adnexed, ventricose, crowded, white.

On the ground. King's Cliffe, on an asparagus-bed. In my specimens the stem is sometimes thickened, sometimes attenuated.

70. A. (*Tricholoma*) *humilis*, *Fr.*; pileus fleshy, soft, umbonate, then convexo-plane or depressed, even, smooth or pulverulent, hygrophamous; margin thin, reaching beyond the

gills; stem stuffed, pale, villosopulverulent; gills rounded, with a decurrent tooth, crowded, ventricose, dirty white.

On the ground, and amongst grass. This is *A. blandus*, Eng. Fl. The pileus is often pulverulent, and varies much in colour, according to its condition; stem 2 inches high, 2 lines thick, brown within at the base. Frequently a very pretty species, perhaps too closely allied to *A. brevipes*. Klotzsch's figure, Fl. Regn. Bor. t. 374, seems just intermediate.

71. **A.** (*Tricholoma*) *subpulverulentus*, *P.*; pileus fleshy, at first convex, even, with an innate white pruinose lustre; margin inflexed; stem solid, equal, smooth, somewhat striate; gills rounded, without any tooth, crowded, white.—*Huss. ii. t. 39.*

In pastures. Not uncommon. About 2 inches across. Dirty white or greyish, with a white lustre.

Subgenus 5. **CLITOCYBE**.—Stem elastic, with a fibrous outer coat; gills decurrent or acutely adnate.

\* *Pileus not changing colour when dry.*

72. **A.** (*Clitocybe*) *nebularis*, *Batsch*; pileus fleshy, compact, obtuse, even, clouded with grey, at length naked; stem stuffed, firm, striate with little fibres; gills arcuate, subdecurrent, crowded, white, becoming pallid.—*Grev. t. 9; Huss. ii. t. 9.*

In woods. Common. The clouded cinereous pileus is characteristic. Pileus 3 inches across; stem stout. Esculent.

73. **A.** (*Clitocybe*) *fumosus*, *P.*; subcartilaginous, rigid; pileus fleshy, at first convex, obtuse, even, naked, turning pale; cuticle adnate; stem stuffed, unequal, somewhat pruinose above, grey or dirty white, as are the rather crowded adnate gills.

In woods and waste ground. Not common. Solitary, or

densely cæspitose. In the latter state it is the subspecies *A. polius*. It occurred abundantly in October, 1859, at Coed Coch.

74. *A. (Clitocybe) inornatus*, *Sow.*; pileus fleshy, plane or depressed, obtuse, even, smooth; cuticle separable; stem solid, nearly equal, smooth, firm, grey, as well as the adnate, plane, at length decurrent, crowded gills.—*Sow. t.* 342.

Amongst grass. I have not met with this species. The separable cuticle indicates *A. grammopodius*, but the gills are not in the least arcuato-adnate.

75. *A. (Clitocybe) vernicosus*, *Fr.*; pileus fleshy, depressed, obtuse, even, smooth, shining; stem stuffed, equal, short, yellow, as well as the adnate, slightly decurrent, rather distant gills.—*Sow. t.* 366.

In fir-woods. Pileus 3 inches across. Not found in this country since the time of Sowerby.

76. *A. (Clitocybe) odoratus*, *Bull.*; dirty green, tough; pileus fleshy, at length plane, even, smooth; stem stuffed, unequal, elastic, thickened at the base; gills adnate, moderately distant, broad, pallid.—*Sow. t.* 42.

In woods. Common. Easily known by its greenish colour and strong smell of aniseed; stem smooth and downy. *A. viridis*, With. (*Bolton, t.* 12. n. 10), is too doubtful to insert. Greville's figure has much greater right to be considered the same as *Bull.* 176, having narrow gills. The two supposed species are probably not distinct.

77. *A. (Clitocybe) cerussatus*, *Fr.*; white; pileus fleshy, at first convex, obtuse, even, moist, soon smooth; stem spongy, solid, tough, elastic, naked; gills adnate, very crowded, thin, then decurrent, and unchanged in colour.—*Fl. Dan. t.* 1796.

In fir-woods. Not umbonate as *A. opacus*. Probably esculent.

78. **A.** (*Clitocybe*) *phyllophilus*, *Fr.*; white; pileus fleshy, soon depressed and umbilicate, even, dry, marked with a white lustre round the margin; stem stuffed, then hollow, spongy, fibrous; gills adnate, decurrent, moderately distant, white, then yellowish.—*Fl. Dan.* 1847.

Amongst leaves, in woods. Distinguished from the last by its umbilicate pileus, and the gills changing at length to yellow.

79. **A.** (*Clitocybe*) *candicans*, *P.*; white; pileus subear-nose, at first convex, then plane or depressed, even, shining, with a thin dead-white film; stem subfistulose, waxy, shining, even; gills adnate, crowded, thin, at length decurrent.

Amongst leaves in woods. When moist white, when dry dead-white. About 1 inch across. In the nature of the stem it approaches *Omphalia*.

80. **A.** (*Clitocybe*) *dealbatus*, *P.*; white; pileus rather fleshy, at first convex, even, smooth, rather shining; stem stuffed, fibrous, thin, equal, pruinose above; gills adnate, crowded, thin, white.—*Sow. t.* 123.

In fir plantations. Short, about an inch across, sometimes cup-shaped, innato-pruinose under a lens.

81. **A.** (*Clitocybe*) *gallinaceus*, *Scop.*; white, slightly acid; pileus rather fleshy, convex, then depressed, very obtuse, even, dry, opaque; stem solid, equal, thin, even; gills subdecurrent, crowded, thin.—*Huss. i. t.* 39.

In pastures. Very common. Distinguished from the last by its opaque pileus and strong fungoid smell. The opacity arises from minute pubescence. About an inch across.—Bolton, t. 4, f. 2, is very doubtful.

82. **A.** (*Clitocybe*) *elixus*, *Sow.*; pileus umbonate, at first convex, at length variously depressed, dingy, minutely tomentose and streaked; stem even, nearly of the same colour as the pileus; gills decurrent, distant, white.—*Sow. t.* 172.

In woods. Pileus 3 inches across, very bibulous; flesh dirty-white, soft. Formerly referred by Fries to *Hygrophorus caprinus*.

83. **A.** (*Clitocybe*) *opacus*, *With.*; white; pileus fleshy, convex, expanded or depressed, umbonate, even, covered with a floccose shining film; stem stuffed, subfibrillose, unequal, flexuous; gills adnate, decurrent, very crowded, white.—*Sow. t. 142.*

In woods. Too nearly related to *A. cerussatus*. Remarkable for the silvery glaire with which it is clothed, which sometimes admits of being rubbed off.

84. **A.** (*Clitocybe*) *giganteus*, *Sow.*; pileus thin, fleshy, splitting, clothed with minute matted down, at length squamulose, funnel-shaped; disc always depressed; stem solid, hard, blunt, equal, even; gills very crowded, slightly decurrent, changing from white to yellowish.—*Sow. t. 244; Huss. i. t. 79.*

In woods. Forming large rings. Not very common. Nearly a foot across.

85. **A.** (*Clitocybe*) *infundibuliformis*, *Schæff.*; pileus thin, fleshy, at first convex, umbonate, clothed with minute innate down, at length funnel-shaped, flaccid; stem stuffed, soft, elastic; gills decurrent, moderately distant, white. (Plate 5, fig. 2.)

On the sides of woods, amongst moss, etc. Extremely common. Pileus mostly of a pale reddish-tan, 2-3 inches across, often retaining traces of the umbo; its edges occasionally plicate, at length soft.

86. **A.** (*Clitocybe*) *geotrupus*, *Bull.*; pileus fleshy, convex, then broadly funnel-shaped, strongly umbonate, compact, even, smooth; stem solid, compact, fibrillose, attenuated upwards; flesh white; gills crowded, decurrent, unbranched,

white, at length of the same colour as the pileus.—*Grev. t.* 41 ; *Huss. i. t.* 66.

In woods and on their borders. Not uncommon, often forming rings. Pileus white, tan-coloured, etc. *A. subinvolutus*, Batsch, is a thicker, firmer, less funnel-shaped form, with the margin generally grooved, and the surface spotted from rain or dew. It is very good when dressed, and is generally found near fir-trees. Bolton's *t.* 22, with distant gills, is very doubtful.

87. **A.** (*Clitocybe*) *inversus*, *Scop.*; pileus fleshy, brittle, convex, then funnel-shaped, smooth; margin thin, involute; stem stuffed, thin, hollow, rather rigid, smooth; flesh pallid; gills decurrent, unbranched, pallid, at length of the same colour as the pileus.—*Sow. t.* 186.

In fir-woods. Not common. Pileus 2 inches across, not flaccid like the next; brownish-red at first, then tan-coloured. Often cæspitose. Sowerby's plant is unusually lobed.

88. **A.** (*Clitocybe*) *flaccidus*, *Sow.*; pileus thin, rather fleshy, flaccid, umbilicate, then funnel-shaped, even; stem stuffed, unequal, rather flexuous, villous at the base; gills decurrent, crowded, arched, yellowish.—*Sow. t.* 185.

In fir-woods. Not uncommon. Often densely cæspitose, and very handsome. Pileus bright in colour, sometimes streaked, flaccid when young.

\*\* *Pileus hygrophanous.*

89. **A.** (*Clitocybe*) *cyathiformis*, *Fr.*; pileus thin, depressed, then funnel-shaped, even, nearly smooth, moist, hygrophanous; margin even, for a long time involute; stem stuffed, elastic, attenuated upwards, fibrillose, more or less reticulated; gills adnate, then decurrent, joined behind, dingy.—*Sow. t.* 363; *Huss. ii. t.* 1.

In meadows, etc. Very common late in the year. Pileus 2 inches across, variable in colour, as are the gills, generally of a dark brown or bistre.

90. **A.** (*Clitocybe*) *brumalis*, *Fr.*; inodorous; pileus rather fleshy, thin towards the margin, umbilicate, funnel-shaped, smooth, flaccid, hygrophaneous; margin reflexed, even; stem equal, somewhat incurved, smooth, dirty white; gills distinct, decurrent, pallid.—*Bull. t.* 248 *A, B.*

In woods. Canterbury. This is *A. metachrous*, *Engl. Fl.*, whose characters agree rather with Bulliard's figure quoted above than with Fries's character. Livid grey when moist, nearly white when dry.

91. **A.** (*Clitocybe*) *metachrous*, *Fr.*; inodorous; pileus somewhat fleshy, convex, then plane and depressed, hygrophaneous; stem stuffed, then hollow, equal, tough, pruinose above; gills adnate, crowded, pale, cinereous.

In woods amongst leaves. King's Cliffe. Pileus  $1\frac{1}{2}$ –2 inches across; gills not truly decurrent.

92. **A.** (*Clitocybe*) *fragrans*, *Sow.*; sweet-scented; pileus rather fleshy, convex, then plane or depressed, hygrophaneous; stem stuffed, then hollow, elastic, smooth; gills rather crowded, subdecurrent, distinct, dirty white.—*Sow. t.* 10.

In woods. Common. Known by its sweet, anise-scent, which resembles that of *A. odorus*. Pileus  $1\frac{1}{2}$  inch across, ochraceous, white.

93. **A.** (*Clitocybe*) *difformis*, *P.*; pileus submembranaceous, convex, then plane, subumbilicate, smooth, hygrophaneous, striate when moist, even when dry, at length subsquamuloso-rimose; stem hollow, equal, smooth, shining; gills adnate, distant, dirty white.—*Bolt. t.* 17 (dry state).

In fir plantations. Near Halifax. Livid when moist.

94. **A.** (*Clitocybe*) *ectypus*, *Fr.*; pileus rather fleshy, flat-

tened out, at length depressed and revolute, hygrophanous, finely streaked with little close-pressed sooty fibres; margin slightly striate; stem rather hollow, elastic, fibrillose; gills adnate, rather distant, becoming pallid, at length stained with red.

In meadows. Mossburnford, near Jedburgh, *A. Jerdon, Esq.* Pileus honey-coloured; gills mealy with the spores. Specimens sent from Scotland exactly accord with a figure forwarded to me by Fries.

95. *A. (Clitocybe) bellus, P.*; pileus rather fleshy, convex, then depressed, dull-orange, sprinkled with minute darker scales; stem stuffed, equal, tough, rivulose, dull yellow, as well as the rather distant adnate gills, which are connected by veins, at length reddish-brown.

In fir plantations. East Morden, Dorsetshire. Pileus  $2\frac{1}{2}$  inches broad, deep orange-brown, becoming gradually pale. Gills incarnato-ferruginous. Stem  $2\frac{1}{2}$  inches high. Fries's plant has dirty-yellow gills, and so far differs from mine. It is at once distinguished from *A. laccatus* by its fetid smell.

96. *A. (Clitocybe) laccatus, Scop.*; pileus convex, then mostly umbilicate, variable in form, hygrophanous, mealy, subsquamulose; stem stuffed, equal, tough, fibrous, bright-coloured, as well as the thick, broad, distant gills. (Plate 5, fig. 3.)—*Grev. t. 249; Huss. i. t. 47.*

In woods, etc. Extremely common. Varying much in size, colour, etc. Sometimes of a bright amethyst-blue, more frequently of a reddish-brown or grey (*Sow. t. 187*), sometimes yellowish. Spores globose: a very uncommon character amongst Agarics. *Bolton, t. 41, f. A,* is at present doubtful, but its peculiar habitat, on the perpendicular sides of turfpits, must some day make it easy to recognize.

Subgenus 6. COLLYBIA.—Stem cartilaginous externally. Margin of pileus at first involute. Gills not decurrent.

\* *Gills white, or of a pure colour.*

97. A. (*Collybia*) *radicatus*, *Relh.*; pileus thin, fleshy, obtuse, at length plane, wrinkled, glutinous; stem tall, attenuated upwards, rooting; gills adnexed, distant, white. (Plate 5, fig. 4.)—*Huss. i. t. 15.*

On old stumps, or on sticks covered with soil. Very common. The long tap-root, wrinkled pileus, and distant white gills, at once distinguish this species. Pileus 3–4 inches across; stem 6 inches high. I once gathered a white variety of this, with the pileus scarcely an inch across, though perfectly developed. The colour is generally greyish-brown.

98. A. (*Collybia*) *longipes*, *Bull.*; pileus thin, fleshy, conical, then expanded, umbonate, dry, slightly velvety; stem attenuated upwards, rooting, velvety; gills distant, rounded behind, white.—*Bull. t. 232*; *Huss. i. t. 80.*

In the same situations as the last, but not so common. When well grown, one of the most beautiful of our Agarics. Pileus and stem often tinted with yellow.

99. A. (*Collybia*) *platyphyllus*, *Fr.*; pileus thin towards the margin, expanded, obtuse, moist, streaked with little fibres; stem stuffed, equal, soft, striate, naked, pallid, ending abruptly; gills distant, truncate behind, adnexed, white.—*Bull. t. 594.*

In woods, amongst leaves. Rare. King's Cliffe. Pileus several inches across, umber or brownish. The form with a stout, creeping, string-like mycelium, named *A. repens* by Fries, has been found by Mr. Broome in the south of England, and by myself in Denbighshire. Stem not so distinctly cartilaginous as in other *Collybiæ*.

100. A. (*Collybia*) *fusipes*, *Bull.*; pileus fleshy, convex, smooth, at first even, then frequently cracked; stem more or less twisted and split, swollen, sulcate, rooting below, and spindle-shaped; gills adnexed, nearly free, at length separating behind, connected by veins, white, then nearly of the same colour as the pileus. (Plate 5, fig. 5.)—*Huss.* ii. t. 48.

On stumps. Very common. Pileus 3 inches across. Often densely cæspitose, more or less rufous. Gills often spotted. Very variable in size and form. An early species. *A. œdematopus*, as far as the English Flora is concerned, rests upon an imperfect plant of Dickson. If distinct, the decurrent gills must be the principal character, in which case it could not be a *Collybia*. This circumstance may, however, arise from some peculiar condition of the pileus.

101. A. (*Collybia*) *maculatus*, *A. and S.*; pileus fleshy, compact, convex, then plane, obtuse, even, smooth; stem stout, ventricose, striate, attenuated below, white, as well as the free gills.—*Sow.* t. 246; *Huss.* ii. t. 60.

In fir-woods. Not common. Pileus 2–3 inches across, at first white, then, like the stem, spotted with reddish-brown.

102. A. (*Collybia*) *butyraceus*, *Bull.*; pileus fleshy, convex, at length expanded, moist, changing colour; flesh turning white; stem slightly stuffed, externally cartilaginous, conical, striate, reddish brown; gills nearly free, crowded, crenulate, white.—*Bull.* t. 572.

\* In woods, especially fir-woods. Extremely common. Easily distinguished by its greasy-looking pileus and cartilaginous stem. The pileus is at first dark-bay, but as it dies exhibits various pallid tints. Stem often compressed. *A. compressus*, *Sow.* t. 66, is very doubtful, but I believe it to be *Hygrophorus ovinus*. *A. concinnus*, *Bolt.* t. 15, is described as clothed with a viscid slippery fluid, and therefore cannot

be *A. pullus*, to which Fries refers it. It is probably *Hygrophorus unguinosus*.

103. A. (*Collybia*) *velutipes*, *Curt.*; pileus thin, fleshy, convex, then plane, obtuse, smooth, viscid; stem stuffed, velvety, rooting, dark-bay; gills adnexed, distant, yellowish.—*Fl. Lond. t. 70*; *Huss. i. t. 56*.

On logs and trunks of trees. Extremely common during the greater part of the year, and even resisting considerable frost. One of our most beautiful species, from its tawny pileus and dark velvety stem. Often densely tufted.

104. A. (*Collybia*) *stipitarius*, *Fr.*; small; pileus thin, umbilicate, plane, clothed with little velvet-like scales; stem at length fistulose, bright brown, more or less hairy; gills separating, at length free, ventricose, rather distant, white. (Plate 5, fig. 6.)—*Huss. i. t. 68*.

On grass, old thatch, twigs, etc. A very pretty little species, with the habit of a *Marasmius*, but the gills of an *Agaric*. Pileus clothed with tawny or brown hairs or fibres, which sometimes form scales.

105. A. (*Collybia*) *confluens*, *P.*; pileus slightly fleshy, convex, at length expanded, obtuse, flaccid, smooth, hygrophanous; stem fistulose, somewhat compressed, rufous, clothed with white pulverulent down; gills free, remote, linear, very crowded, dirty-white.—*Pers. Ic. Pict. t. 5. f. 1*.

Amongst leaves, in woods, forming rings or confluent masses. Common. Pileus about an inch across, reddish-brown. Gills leaving a distinct area round the top of the stem. Stems adhering to each other.

106. A. (*Collybia*) *ingratus*, *Schum.*; pileus slightly fleshy, at first globose, then campanulate, convex, umbonate, even; stem fistulose, long, twisted, somewhat compressed, between pulverulent and downy, especially above, umber below; gills free, linear, very crowded, pale.

Var. pileus convex, obtuse; stem villosopulverulent.

In woods. Differs principally from the foregoing in the gills not leaving a free space round the top of the stem. My species agrees more closely with the figure in the Stockholm collection than with Fries's character, as the whole stem is more or less pulverulent. The pileus, moreover, is not so truly campanulate. I have set it down, therefore, as a variety.

107. *A. (Collybia) undatus*, Berk.; pileus tough, thin, radiato-rugose, minutely pulverulent, campanulate, then convex, at length plane; stem minutely velvety, strigose at the base, fistulose; gills adnate, white, with a yellowish tinge, connected with veins.

On dead fern-roots. Northamptonshire. Pileus not exceeding an inch across, dull brown or cinereous. Gills moderately distant.

108. *A. (Collybia) conigenus*, P.; pileus slightly fleshy, nearly plane, unequal, somewhat umbonate, smooth; stem minutely fistulose, tough, pulverulent, becoming pallid; root strigose; gills free, linear, very crowded, pallid.

On fir-cones. Not very uncommon. Pileus about 1 inch across, reddish-brown at first, pallid when dry; gills white at first. This must not be confounded with *A. tenacellus*.

109. *A. (Collybia) cirrhatus*, Schum.; white; pileus slightly fleshy, plane, minutely silky, at length umbilicate; stem slightly fistulose, flexuose, equal, pallid, pulverulent; root twisted, fibrillose; gills adnate, crowded, narrow.

Amongst leaves, etc.; often attached to a little, yellowish, nodular *Sclerotium*. Very nearly allied to the next.

110. *A. (Collybia) tuberosus*, Bull.; white, slightly fleshy, convex, then expanded, umbonate, even, shining with a silky lustre; stem slightly fistulose, obsolete pulverulent; root

tuberiform, smooth, shining, chestnut-brown; gills adnate, crowded, thin.—*Grev. t.* 23.

On dead *Russule*, and on the ground, probably where Fungi have decayed. The dark tuberiform base easily distinguishes this species.

111. A. (*Collybia*) *racemosus*, *P.*; pileus convex, grey; stem grey, sprinkled with racemose abortive pilei; gills adnate, crowded, white.—*Sow. t.* 287.

On the ground. Extremely rare. It has occurred once or twice at King's Cliffe. I am convinced now that it is not a mere form of the last, as it turns black in drying.

112. A. (*Collybia*) *xanthopus*, *Fr.*; pileus slightly fleshy, convex, then expanded, somewhat umbonate, smooth, dull yellow, and even, as well as the fistulose, equal stem; base equal, rooting, strigose; gills truncate behind and free, broad, thin, loose, crowded, dirty-white.

About the stumps of trees, furze-bushes, etc. Not uncommon. Very near to *A. dryophilus*.

113. A. (*Collybia*) *esculentus*, *Jacq.*; pileus slightly fleshy, nearly plane, obtuse, quite smooth, clay-coloured, as well as the obsolete fistulose, equal, straight, tough, rooting stem; gills adnate, loose, whitish.—*Bull. t.* 422. *f.* 2.

In pastures, in spring. Common in Scotland, in fir plantations. Varies with a dark and light pileus, about an inch across. Eatable, but not much esteemed, on account of its bitter flavour. It is called at Vienna, where large baskets appear in the market in spring, *Nagelschwämme*, or Nail-Mushroom.\*

114. A. (*Collybia*) *tenacellus*, *P.*; pileus slightly fleshy, nearly plane, somewhat umbonate, even, smooth; stem ob-

\* This is an exception to the general rule that *Schwamm* indicates one of the harder, corky Fungi.

scurely fistulose, tough, naked, tawny; root strigose; gills emarginate, broad, loose, rather distant, snow-white.—*Sow. t.* 206.

On fir-cones. Not uncommon. Pileus about an inch across, tinged with brown; stem tawny below, white above. Easily known by its broad, emarginate gills.

115. **A.** (*Collybia*) *acervatus*, *Fr.*; cæspitose; pileus convex, expanded, at length umbonate, smooth, hygrophanous; margin slightly striate; stem fistulose, smooth, deep red-brown, rooting and tomentose at the base; gills free, crowded.

At the base of old fir-stems. Not uncommon. In the British plant the inner walls of the fistulose stem are strigose. Resembling the next. Pileus at first reddish.

116. **A.** (*Collybia*) *dryophilus*, *Bull.*; pileus rather fleshy, nearly plane, obtuse, somewhat depressed, even, turning pale; stem fistulose, smooth, reddish-brown or yellowish; gills sinuated, adnexed (at length with a decurrent tooth), nearly free, crowded, narrow, white, or pallid.—*Sow. t.* 127; *Huss. i. t.* 39.

Amongst leaves, in woods. Extremely common, but variable in colour, form, etc. Pileus 1-2 inches across.

117. **A.** (*Collybia*) *exsculptus*, *Fr.*; pileus slightly fleshy, tough; convex, then expanded, umbilicate, not changing colour, smooth, as well as the fistulose, thin, curved, short stem; gills nearly free, with a decurrent tooth, arched, much crowded, narrow, sulphur-coloured.

On decayed oak. Suffolk, *Dr. Badham*, from whom I have specimens. Size that of the last.

118. **A.** (*Collybia*) *clavus*, *Bull.*; pileus slightly fleshy, nearly plane, obtuse, even; stem stuffed, thin, smooth, straight, white, as well as the free crowded gills, which separate slightly at the base.—*Bull. t.* 148 A-C, 569 F.

On twigs, leaves, etc. This is a minute species, differing from *A. acicula* in its white stem and gills, but agreeing somewhat in the orange-red pileus. It is introduced on the faith of Bolton's figure and description, t. 39 *B*, which, however, may possibly be *A. acicula*. I have not met with it myself.\* The 'English Flora' plant is *A. acicula*.

119. *A. (Collybia) ocellatus*, *Fr.*; pileus slightly fleshy, nearly plane, even; disc depressed, darker, umbonate; stem minutely fistulose, filiform, smooth, brownish-white, rooting and fibrillose at the base; gills crowded, white, adnexed, at length separating.—*Bull. t.* 569. *f.* 1 *H-P*.

On the ground, amongst leaves. Not common. Kinnordy, *Klotzsch*.

\*\* *Gills at length cinereous.*

120. *A. (Collybia) laceratus*, *Lasch*; pileus between fleshy and membranaceous, campauulate, rather blunt, moist, streaked with brown; stem stuffed, then hollow, firm, twisted, fibroso-striate, floccoso-pruinose above, at length compressed; gills distant, adnexed, broad, thick, greyish-white.

In pine-woods. Bristol, *Dr. H. O. Stephens*. Pileus dingy, pallid when dry,  $1\frac{1}{2}$  inch across. Allied to *A. platyphyllus*.

121. *A. (Collybia) atratus*, *Fr.*; pileus slightly fleshy, plano-depressed, umbilicate, very even, smooth, shining; margin convex; stem stuffed, short, even, smooth, brown without and within; gills adnate, rather broad, dirty-white.

On burnt soil, in woods. King's Cliffe. Pileus 1 inch across, dark brown at first. Stem 1 inch high, 1–2 lines thick. I have a figure of this from the Swedish Museum, which represents the stem as nearly white.

\* I have a specimen from Dr. Stephens, gathered at Bristol, marked by him *A. clavus*, *Bull.*, which is apparently Bulliard's plant.

Subgenus 7. MYCENA.—Stem externally cartilaginous. Margin of pileus (which is mostly campanulate) at first straight and pressed to the stem.

\* *Margin of gills different in colour from their surface.*

122. **A.** (*Mycena*) *pelianthinus*, *Fr.*; pileus somewhat fleshy, convex, nearly plane, moist, hygrophanous; margin striate; stem firm, fibrilloso-striate; gills emarginate, adnexed, beautifully connected by veins, edge darker, somewhat toothed. (Plate 6, fig. 1.)

Amongst dead leaves, in woods. Not very common. Pileus at first lilac or rose-coloured,  $1\frac{1}{2}$ –2 inches across; gills purplish, with a darker toothed edge, a character which at once distinguishes it from *A. purus*.

123. **A.** (*Mycena*) *balaninus*, *B.*; pileus somewhat fleshy, convex, umbonate, dry, minutely pulverulent, striate when moist; stem rooting, villous and dark below, white and pruinose above; gills connected by veins, pale, with a purple edge.—*Mag. of Zool. and Bot.* i. t. 15. f. 2.

Amongst oak-leaves, beech-mast, etc. Rare. King's Cliffe. An exquisite species. Stem bright brown below, spongy at the base. Gills sprinkled with purple spicules. Pileus ochraceous, 1 inch or more across.

124. **A.** (*Mycena*) *elegans*, *P.*; pileus submembranaceous, campanulate, striate, umbonate; stem even, equal, rigid, tomentose at the base, floccoso-fibrillose; gills linear, adnate, dirty-white; edge yellow, entire.

In woods. Not uncommon. Pileus half an inch or more across, greyish or livid-yellow. I have given Fries's character, but find the gills rather broad, though scarcely ventricose. The dark tint is often confined to the part nearest the pileus.

125. **A.** (*Mycena*) *rubro-marginatus*, *Fr.*; pileus submembranaceous, campanulate, obtuse, striate, hygrophanous; stem rigid, even, juiceless; gills adnate, distant, dirty-white, edged with purple or purple-brown.

On pine-stumps. Nassington, Northamptonshire. Nov. 1859. A small species, resembling somewhat *A. sanguinolentus*, but distinguished at once by the absence of red juice in the stem.

126. **A.** (*Mycena*) *strobilinus*, *Sow.*; scarlet; pileus slightly fleshy, bell-shaped; umbo acute, even; margin striate; stem stiff, juiceless, even, clothed at the base with white strigose hairs; gills adnate, edge dark blood-colour.—*Sow. t.* 197.

On fir-cones. Rare.

127. **A.** (*Mycena*) *rosellus*, *Fr.*; rose-coloured; pileus membranaceous, hemispherical, obtuse, umbonate, striate; stem slender, soft, juiceless, clothed with white fibrillose hairs at the base; gills adnate, edge darker.

Amongst fir-leaves. Rare. West of England, *C. E. Broome*. An extremely pretty little species.

\*\* *Stem not dilated into a disc at the base; gills self-coloured.*

128. **A.** (*Mycena*) *purus*, *P.*; strong-scented; pileus slightly fleshy, bell-shaped, then expanded, obtusely umbonate, smooth, turning pallid; margin striate; stem rigid, even, nearly naked, villous at the base; gills very broad, widely sinuated, adnexed, connected by veins, paler than the pileus.—*Huss. ii. t.* 49.

Amongst leaves, in woods. Extremely common. Known at once by its strong scent and pretty colour, which changes as the pileus becomes dry. *A. pelianthinus*, which it somewhat resembles, is distinguished by the discoloured edge of the gills, and other characters.

129. **A.** (*Mycena*) *Iris*, *Berk.*; pileus hemispherical, obtuse, striate, subviscid, adorned with blue fibrillæ; stem fasciculate, pilose; gills almost free. (Plate 6, fig. 3.)

On fir-stumps. Rare. Clifton, Notts. The little fibrils glued down to the cuticle are very characteristic. When the stem is extremely elongated, it is sometimes nearly smooth.

130. **A.** (*Mycena*) *Adonis*, *Bull.*; pileus membranaceous, conico-campanulate, smooth, nearly even; stem slender, even, smooth; gills uncinatè, adnexed, linear, narrow, white, or tinged with rose-colour.—*Bull. t.* 560. *f.* 2.

In woods. Rare. Kirriemuir, *Klotzsch.* King's Cliffe. White, yellowish, orange, or green.

131. **A.** (*Mycena*) *luteo-albus*, *Bolt.*; pileus membranaceous, bell-shaped, umbonate, slightly striate, dry, yellowish, as well as the smooth shining stem; gills adnate, somewhat uncinatè, broad, white.—*Bolt. t.* 38. *f.* 2.

Amongst moss, in woods. Rare. Halifax.

132. **A.** (*Mycena*) *lacteus*, *P.*; pileus membranaceous, bell-shaped or convex, subumbonate, striate when moist, even when dry; stem equal, filiform, rather tough, flexible, smooth; gills adnate, ascending, narrow, milk-white.—*Bull. t.* 563 *N, O.*

In fir-woods, attached to the leaves, or on the naked soil. Often very abundant. Milk-white, or sometimes yellowish in the centre.

\*\*\* *Stem firm, rigid; gills changing colour; pileus not hygrophanous.*

133. **A.** (*Mycena*) *proliferus*, *Sow.*; pileus rather fleshy, broadly bell-shaped, dry, darker in the centre; margin at length sulcate; stem firm, rigid, smooth, shining, minutely striate, rooting; gills adnexed, more or less distinct, at length pallid.—*Sow. t.* 169.

On soil, in gardens, near wood. Not common. Densely caespitose. Stem frequently proliferous, as in some species of *Coprinus*. Inodorous.

134. A. (*Mycena*) *galericulatus*, *Scop.*; pileus submembranaceous, between conical and bell-shaped, then expanded, striate as far as the umbo, dry, smooth; stem rigid, polished, even, smooth, rooting at the base; gills adnate, with a decurrent tooth, connected by veins, dirty-white or flesh-coloured.

On trunks of trees. Extremely common. Often densely caespitose, but sometimes scattered. Variable in colour, and sometimes stained with the ulmates and humates of the decaying wood. Inodorous and tasteless.

135. A. (*Mycena*) *polygrammus*, *Bull.*; pileus submembranaceous, conico-campanulate, somewhat umbonate, dry, striate; stem rigid, shining, deeply and continuously sulcato-striate; gills attenuated behind.—*Sow. t.* 222.

On trunks of trees. Common. Easily distinguished by its shining, silvery, grooved stem.

136. A. (*Mycena*) *parabolicus*, *A. and S.*; pileus submembranaceous, at first oval, then parabolic, obtuse, discoid, turning pale, striate halfway; margin entire, turning white; stem rigid, even, smooth, of the same colour as the pileus, strigose at the base, swollen, abrupt, rooting; gills adnate, ascending, nearly distinct, whitish.—*Sow. t.* 165.

On trunks, especially of fir. Pileus dark in the centre, then of a livid-blue, then whitish. Sowerby's plant is on willow-stumps.

\*\*\*\* *Stem brittle; gills changing colour. Strong-scented.*

137. A. (*Mycena*) *atro-albus*, *Bolt.*; rather firm; pileus somewhat fleshy, obtusely bell-shaped, even, smooth, opaque, brown, whitish and striate towards the margin; stem straight,

shining, two-coloured; root hairy, bulbous; gills attenuated, nearly free, ventricose, white.—*Bolt. t.* 137.

Amongst moss, about the roots of trees. Not common.

138. A. (*Mycena*) *dissiliens*, *Fr.*; very brittle; pileus submembranaceous, conico-campanulate, obtuse, lineato-plicate halfway up; stem attenuated, somewhat incurved, finely striate, cinereous, dark, strigose at the base; gills rounded, seceding, at length free, broad, soft, dirty-white, grey at the base.—*Bolt. t.* 154.

On trunks of trees. About Halifax. The species takes its name from the stem, when compressed, breaking up into revolute laciniae. Strong-scented.

139. A. (*Mycena*) *alcalinus*, *Fr.*; rigid, but brittle, strong-scented; pileus submembranaceous, bell-shaped, obtuse, naked, deeply striate, moist, shining when dry; stem smooth, slightly sticky, shining, villous at the base; gills adnate, rather distinct, white, at length tinged with blue.

On trunks of trees. Common. Easily distinguished by its strong nitrous scent, like that of fermented walnuts. Often tinged everywhere with yellow or pink. Solitary or caespitose.

140. A. (*Mycena*) *pauperculus*, *Berk.*; strong-scented; pileus obtusely conical or hemispherical, minutely innato-fibrillose, submembranaceous; stem smooth, rooting, villous at the base; gills at first free, then adnexed, white.

Inside of decayed stumps. Not common. Minute, ochraceous-white, at length stained from the wood. Odour farinaceous. Gills adnexed, from the growth of the pileus, which is sometimes striate from translucence. This, perhaps, would be better placed before No. 137.

141. A. (*Mycena*) *tenuis*, *Bolt.*; very brittle; pileus membranaceous, bell-shaped, convex, obtuse, lineato-striate; margin crenate, appendiculate; stem straight, pellucid, membra-

naccous; gills adnate, distant, distinct, thin, watery, dirty-white.—*Bolt. t. 37.*

In shady, moist woods. Rare. Halifax. Almost as delicate as *Bolbitius titubans*. Stem quite membranaceous.

142. A. (*Mycena*) *tenellus*, *Schum.*; tufted; pileus membranaceous, bell-shaped, convex, obtuse, pellucid, margin slightly striate; stem slender, soft, smooth, villous at the base; gills unciniate, very thin, crowded, white or flesh-coloured.—*Raii Syn. t. 1. f. 2.*

On decayed trees. This species has not been found in England since the time of Ray, and it is very rare on the Continent. It is either entirely white, or tinged with rose-colour.

\*\*\*\*\* *Stem filiform, flaccid; gills distinct, changing colour.*

*Not cæspitose.*

143. A. (*Mycena*) *filopes*, *Bull.*; pileus membranaceous, obtusely campanulate, expanded, striate; stem filiform, flaccid, rather brittle, smooth, pilose at the base, rooting; gills free, lanceolate, crowded, white.—*Bull. t. 320.*

In woods, among leaves. Not uncommon. Pileus livid-brown or umber, tinged with pink. Gills sometimes adnexed. Odour not nitrous.

144. A. (*Mycena*) *vitis*, *Fr.*; pileus membranaceous, conical, then expanded, moist, deeply striate, growing pallid; stem straight, filiform, flexible, smooth, juiceless, shining, rooting; gills attenuato-adnate, rather distant, greyish-white.—*Sow. t. 385. f. 5.*

Amongst leaves, etc. Not uncommon. The gills vary a good deal in colour, and are sometimes very dark.

145. A. (*Mycena*) *speireus*, *Fr.*; pileus membranaceous, conical, then convex, unpolished, striate; disc darker, at

length depressed; stem filiform, tough, shining, fibrillose at the base; gills horizontal, then decurrent, distant, white.

On mossy trunks.

146. A. (*Mycena*) *acicula*, *Schæff.*; pileus membranaceous, bell-shaped, convex, smooth, scarlet; margin striate; stem thread-shaped, rooting, tough, shining, yellow, as well as the rounded, adnexed, ventricose, distant gills.

On leaves, twigs, etc., in woods. Not uncommon. A very delicate and pretty little species. Stem pruinose above. The gills are sometimes white, sometimes yellow, with a whitish edge.

\*\*\*\*\* *Gills and stem milky, or containing coloured fluid.*

147. A. (*Mycena*) *cruentus*, *Fr.*; pileus submembranaceous, conico-campanulate, striate; margin quite entire; stem straight, smooth, villous at the base, and rooting, yielding a dull-red juice; gills dirty-white.—*Sow. t. 385. f. 2, 3.*

In pine-groves. Not observed in this country since the time of Sowerby.

148. A. (*Mycena*) *sanguinolentus*, *A. and S.*; vinous-red; pileus membranaceous, obtusely campanulate, striate; stem containing red juice; gills adnate, edge darker.

Amongst leaves, in woods. Not uncommon. The vinous-red colour of the dark margin of the gills, and the dark juice, readily distinguish this species.

149. A. (*Mycena*) *crocatus*, *Schrad.*; pileus submembranaceous, expanded, slightly striate; stem tall, attenuated, with a villous rooting base, filled with saffron-coloured juice; gills adnexed, attenuated behind, ventricose in front.

Amongst leaves. West of England, *Mr. Knapp*. Figured in the second edition of the 'Journal of a Naturalist.'

150. A. (*Mycena*) *chelidonium*, *Fr.*; pileus membranaceous, campanulato-convex, nearly even; stem even, smooth,

rooting, compressed, filled with yellow juice; gills adnate, dirty-white, at length yellowish.—*Sow. t.* 385. *f.* 4.

On stumps of beech. This also depends upon Sowerby's figure. No one else seems to have observed it. The yellowish gills and pileus are distinctive.

151. **A.** (*Mycena*) *galopus*, *Schrad.*; pileus membranaceous, campanulate, somewhat striate; stem slender, fibrillose and rooting below, filled with white milk; gills attenuated behind, white, then glaucous. (Plate 6, fig. 2.)

Amongst leaves, under trees. Generally diffused, but seldom abundant. Pileus brownish or cinereous, sometimes white. When withered, the white milk is occasionally wanting.

\*\*\*\*\* *Stem distinctly glutinous, not milky.*

152. **A.** (*Mycena*) *epipterygius*, *Scop.*; pileus membranaceous, campanulate, expanded, covered with a viscid separable skin; stem elongated, tough, rooting, viscid, yellowish; gills adnate, with a decurrent tooth.—*Sow. t.* 92.

Amongst fern-leaves, etc., in woods. Extremely common. Very variable in colour, but always easily recognized.

153. **A.** (*Mycena*) *pelliculosus*, *Fr.*; pileus membranaceous, campanulate, obtuse, deeply striate; disc at length depressed; stem tough, viscid, dirty-white; gills adnate, white.

On heaths. Mossburnford, *A. Jerdon, Esq.* October, 1858. Cinereous. Resembling *A. galericulatus* rather than the last.

154. **A.** (*Mycena*) *vulgaris*, *P.*; pileus convex, then depressed, viscid; stem tough, rooting, fibrillose at the base, cinereous; gills decurrent, thin, white. (Plate 6, fig. 4.)

On plantations, especially of larch. Sometimes very abundant. The viscid cinereous pileus, tough stem, and decurrent gills, readily indicate this species.

155. **A.** (*Mycena*) *roridus*, *Fr.*; very delicate; pileus at

length depressed, sulcate, dry; stem dripping with gluten; gills decurrent, rather distant, white.

On dead bramble-twigs, etc. Not common. Nottinghamshire. Springing at once from the twig. Various in colour, but generally white, with a slight cinereous tinge. After abundant rain the dripping stem is very striking.

\*\*\*\*\* *Stem dry, dilated at the base into a little disc.*

156. **A.** (*Mycena*) *stylobates*, *P.*; pileus obtuse, campanulate or convex, striate, slightly pilose; stem smooth, dilated into a radiato-striate villous disc; gills free, distinct, ventricose. (Plate 6, fig. 5.)

On fern, twigs, etc. Not common. Generally pure white. Pileus 2 lines across. Very delicate.

157. **A.** (*Mycena*) *tenerrimus*, *B.*; white, very delicate; pileus convex, pruinose; stem pilose, adhering by a minute, pubescent disc; gills free, ventricose. (Plate 6, fig. 6.)

On fir-cones, sticks, etc. Smaller than the last. Pileus frosted with minute granules; disc not striate. The affinities of *A. pilipes*, Sow., are so doubtful, that it is omitted.

158. **A.** (*Mycena*) *pterigenus*, *Fr.*; very delicate, rose-coloured; pileus campanulate, obtuse, striate, smooth, as well as the thread-like stem, which springs from a little strigose bulb; gills few, broad, adnate, entire. (Plate 6, fig. 7.)

On dead fern-stems. Rare. A minute, but most elegant Agaric. The edge of the gills is often of a deeper tint than the disc. The normal form is found also on dead leaves. A variety of this occurred at Canterbury on oak-leaves, with a lemon-coloured stem and more crowded gills. See 'English Flora.'

\*\*\*\*\* *Stem very slender, dry, growing on other plants without any root; gills adnate, with a decurrent tooth.*

159. **A.** (*Mycena*) *corticola*, *Schum.*; pileus thin, hemi-

spherical, at length obsolete umbilicate, sulcato-striate; stem slightly scurfy; gills broadly adnate, broad, somewhat ovate, paler.

Amongst moss, on bark. Extremely common. Very variable in colour, white, lilac, cinereous, etc. Withering when dry, but often reviving when moistened.

160. A. (*Mycena*) *setosus*, *Sow.*; very delicate; pileus hemispherical, smooth; stem thread-like, covered with spreading hairs; gills distant, white.—*Sow. t.* 302.

On dead leaves, in woods. Nearly allied to the next.

161. A. (*Mycena*) *capillaris*, *Schum.*; very delicate; pileus campanulate, at length umbilicate, smooth; stem thread-like, smooth; gills adnate, ascending, distant.

On dead leaves, in woods. Not uncommon. Slightly tinged with cinereous. So delicate as to be transported with difficulty. Stem often much elongated.

162. A. (*Mycena*) *juncicola*, *Fr.*; very delicate; pileus convex, sometimes minutely umbonate, at length slightly depressed, even, red, striate; stem of the same colour, smooth; gills adnate, distant, white.

On dead rushes, in bogs. Rare. Resembling the foreign *Marasmius hæmatocephalus*. Pileus in my specimens of a deep blood-red, inclining to tawny. Gills few, yellowish-white. Stem brown, paler above, smooth.

Subgenus 8. OMPHALIA.—Stem cartilaginous. Gills truly decurrent.

\* *Gills moderately distant, rather narrow; margin at first incurved.*

163. A. (*Omphalia*) *pyxidatus*, *Bull.*; pileus submembranaceous, at first umbilicate, then infundibuliform, hygrophaneous; margin striate; stem stuffed, at length fistulose, even;

gills decurrent, rather distant, narrow, reddish-grey. (Plate 6, fig. 8.)

Amongst short grass on lawns, etc. Not uncommon. When moist of a deep red-grey. Gills at first flesh-coloured. A small species.

164. **A.** (*Omphalia*) *hepaticus*, *Batsch*; tough, rigid; pileus smooth, rather shining, even; stem at length compressed, flesh-coloured, inclining to rufous; gills distant, connected by veins and forked, rather thick, pallid.—*Batsch*, f. 211.

On lawns. Coed Coch, Denbighshire. Of the same colour as the last, but rather different in habit, and approaching *A. umbelliferus*.

165. **A.** (*Omphalia*) *sphagnicola*, *B.*; tough; pileus infundibuliform, subcarinose, minutely squamulose, moist; stem fistulose; gills narrow, dirty-ochraceous.

On *Sphagnum acutifolium*. Chartley Moss, Staffordshire. Pileus 1–1½ inch across, of a dirty pale-ochre, obscurely striate; gills thick; edge flattish. Stem at first minutely squamulose above, distinguished from *A. Philonotis* by its tough, elastic substance, and other points.

166. **A.** (*Omphalia*) *Oniscus*, *Fr.*; pileus submembranaceous, convex, plano-depressed, remotely radiato-striate; smooth, hygrophorous, smooth when dry; stem subfistulose, firm, equal, livid or dirty-white, as well as the adnate, decurrent, straight, somewhat distant gills.—*Bolt. t.* 41.

In swamps. Not observed since the time of Bolton.

\*\* *Gills very distant, broad, and generally thick; margin at first incurved.*

167. **A.** (*Omphalia*) *muralis*, *Sow.*; pileus submembranaceous, umbilicate, radiato-striate, smooth; brownish-rufous, as well as the short tough stem; margin crenulate; gills decurrent, distant, paler.—*Sow. t.* 322.

On old walls, amongst moss. Not uncommon.

168. **A.** (*Omphalia*) *umbelliferus*, *L.*; pileus membranaceous, convexo-plane, obconic, brittle, radiato-striate, when dry pallid, even, slightly silky; margin at first inflexed, crenate; stem equal, downy at the base; gills decurrent, thick, and very distant, extremely broad behind.

In swamps, exposed pastures, etc. Very common. Varying extremely in colour. A yellow variety, inclining to orange when growing on high mountains, is generally diffused in alpine countries, and is very beautiful. Pileus 2–10 lines across.

169. **A.** (*Omphalia*) *Helvelloides*, *Bull.*; pileus obconic, umbonate, at length depressed, somewhat funnel-shaped, remotely radiato-sulcate; stem elongated; gills thick, forked, decurrent, broad in front.—*Bull. t.* 601. *f.* 3.

On the ground. Navigation House, Monmouthshire. Oct. 27, 1847, *C. E. Broome*. Far more delicate and graceful than any form of *A. umbelliferus*. Fries considers this the same with his *A. setipes*.

170. **A.** (*Omphalia*) *rufulus*, *Berk. and Br.*; pileus umbilicate, reddish-grey, growing pale, somewhat mealy; stem of the same colour, shining; gills decurrent, rather thick, forked, flesh-coloured.—*Ann. of Nat. Hist.* Oct. 1848, *p.* 260.

On an exposed common, amongst *Polytrichum aloides*. Hanham, near Bristol. This little species has the habit and nearly the colours of minute *A. lacatus*.

171. **A.** (*Omphalia*) *stellatus*, *Sow.*; white; pileus slightly fleshy or membranaceous, convex, umbilicate, smooth, striate, diaphanous; stem equal, brittle, stuffed, floccoso-radiate at the base; gills thin, broad, decurrent, very distant.—*Sow. t.* 107.

On sticks, decayed stems of herbaceous plants, etc. Not

common. Distinguished by its thin gills from every state of *A. umbelliferus*.

\*\*\* *At first campanulate, with the margin straight.*

172. **A.** (*Omphalia*) *Campanella*, *Batsch*; pileus membranaceous, convex, umbilicate, striatè, hygrophanous; stem fistulose, dark-brown, attenuated at the base, and clothed with tawny spongy down or hair; gills decurrent, arcuate, connected by veins, yellow.—*Sow. t.* 163.

In fir-woods. Not uncommon. Often cæspitose. Pileus ferruginous, yellow. A beautiful species, which occurs also in tropical America. The form of the cap is variable, but the dark stem and tawny pubescence at the base readily distinguish the species.

173. **A.** (*Omphalia*) *camptophyllus*, *B.*; pileus convexo-plane, deeply striate; stem minutely pubescent, radiato-stri-gose at the base, minutely fistulose; gills white, ascending, then suddenly decurrent.—*Eng. Fl. l. c. p.* 62.

On sticks, etc. Rare. Margate. Pileus brown, with a grey margin, half an inch across. Stem 2 inches high.

174. **A.** (*Omphalia*) *griseus*, *Fr.*; pileus submembranaceous, campanulate, then convex, smooth, striate, hygrophanous; stem fistulose, rather firm, smooth, self-coloured whitish-grey, as well as the slightly decurrent, arcuate, thickish, somewhat distant gills.

In pine-woods. Sherwood Forest, Notts. A small species.

175. **A.** (*Omphalia*) *Fibula*, *Bull.*; pileus membranaceous, turbinate, at first convex, at length somewhat umbilicate, striate, growing pale, even, dry, orange as well as the slender stem; gills deeply decurrent, paler.—*Sow. t.* 45.

Amongst moss. Very common. There is a variety with a brown pileus and white gills. It is always a neat and pretty species.

176. A. (*Omphalia*) *Belliæ*, *Johnst.*; pileus dry, membranaceous, cup-shaped, of a pale wood-colour; stem thin, fistulose, cartilaginous, pale above, brownish below, adhering by a floccose base; gills thick, paler than the pileus, decurrent, interstices veiny.—*Ann. of Nat. Hist. ser. 1. vol. vi. t. 10. f. 1.*

On dead stems of the common reed. Berwickshire, *Lord Home*. See description in the place cited above.

177. A. (*Omphalia*) *integrellus*, *P.*; white, brittle; pileus membranaceous, hemispherical, expanded, pellucid, consequently striate; stem very slender, short, pubescent below; gills distant, decurrent, rather branched, edge acute.

On decayed sticks, etc. Rare. King's Cliffe.

Subgenus 9. *PLEUROTUS*.—Stem excentric, lateral, or wanting.  
Mostly growing on wood.

I. *Pileus entire*.

\* *Furnished with a veil*.

178. A. (*Pleurotus*) *dryinus*, *P.*; pileus hard, compact, oblique, variegated with dark spot-like scales; veil white, torn, fugacious; stem lateral, blunt; gills decurrent, narrow, nearly simple.—*Huss. ii. t. 29, 33.*

On trunks of ash, willow, etc. A beautiful species. Scattered here and there, but never in any abundance.

\*\* *Gills emarginate*.

179. A. (*Pleurotus*) *ulmarius*, *Bull.*; pileus fleshy, compact, convexo-plane, smooth, moist, somewhat spotted; stem rather excentric, stout, thickened below, subtomentose; gills adnexed, emarginate or rounded, rather close, broad, dirty-white.—*Sow. t. 67.*

On elm-trunks, generally many feet from the ground. Not

very common. A large and magnificent species when well grown. I suspect there is a closely allied species, with a veil varnished beneath, of which I once had an imperfect specimen from Mrs. Hussey.

180. **A.** (*Pleurotus*) *subpalmatus*, *Fr.*; pileus soft, fleshy, convexo-plane, obtuse, smooth, wrinkled and gelatinous, especially when young; stem excentric, incurved, equal; gills adnate, crowded, broad, reddish.—*Sow. t.* 62.

On squared timber, old trunks, etc. In several parts of England. Pileus orange-buff, pruinose; flesh mottled, like that of *Fistulina hepatica*; stem fibrous within, smooth, white; gills joined behind, so as to form an obsolete collar. A beautiful and interesting species.

181. **A.** (*Pleurotus*) *fimbriatus*, *Bolt.*; pileus thin, fleshy, plane, then infundibuliform, even, hygrophanous; margin at length lobed and waved; stem subexcentric, compressed, firm, short, rootless, villous; gills thin, adnate, very crowded, somewhat forked, white.—*Bolt. t.* 61.

On trunks of trees. Rare. East Bergholt, *Dr. Badham*. Nearly white. Pileus 3 inches across.

\*\*\* *Gills decidedly decurrent.*

182. **A.** (*Pleurotus*) *euosmus*, *B.*; imbricated, strong-scented; pileus depressed, shining and satiny when dry; stem short or obsolete, confluent; gills ventricose, very decurrent, dingy-white; spores pinkish.—*Huss. i. t.* 75.

On elm-posts. Spring. Hayes, Kent. East Bergholt. Pileus 3 inches across. Somewhat resembling the next, but distinguished by a peculiar scent like that of tarragon, and by its pale lilac spores. Not esulent.

183. **A.** (*Pleurotus*) *ostreatus*, *Jacq.*; pileus soft, fleshy, subdimidiate, conchate, ascending, turning pale; stem short

or obsolete, firm, elastic, strigose at the base; gills decurrent, rather distant, anastomosing behind, dirty-white.—*Huss.* ii. t. 19.

On trees, especially laburnum. Late in the autumn, or winter. Pileus cinereous. *A. glandulosus* is only a form of this. At least, I have seen decided *A. ostreatus* with glandular gills.

184. **A.** (*Pleurotus*) *salignus*, *Hoffm.*; pileus at first compact, then spongy, subdimidiate, horizontal, at first pulvinate, even, then depressed, substrigose; stem short, white, tomentose; gills decurrent, somewhat branched, eroded, distinct at the base, nearly of the same colour.

On trunks of trees. Not common. Mostly solitary, or at least not densely imbricated. Ochraceous when old.

#### II. *Dimidiate, but not resupinate.*

185. **A.** (*Pleurotus*) *petaloides*, *Bull.*; ascending; pileus fleshy, entire, spathulate; disc depressed, villous, as well as the compressed stem; gills decurrent, crowded, linear, dirty-white.—*Bull.* t. 226, 557.

On the ground, amongst grass. Rare. Purton.

186. **A.** (*Pleurotus*) *serotinus*, *Schrad.*; pileus fleshy, compact, viscid; stem thick, lateral, squamulose, with dingy spots; gills determinate, crowded, yellow or pallid.

On trunks of trees. Rare. Mossburnford, *A. Jerdon, Esq.* Pileus 2-3 inches across. Easily known by its decided stem. Pileus yellowish or dingy-olive.

187. **A.** (*Pleurotus*) *mitis*, *P.*; pileus slightly fleshy, tough, reniform, even, smooth; stem lateral, compressed, dilated above, clothed with little white scales; gills crowded, determinate, distinct, white. (Plate 6, fig. 9.)

On dead larch. Scotland, *Klotzsch.* Nottinghamshire,

abundant, but I have not found it elsewhere. About 1 inch across. My specimens are pure white, but it is said to be sometimes rufous, growing pallid as it loses its moisture.

188. A. (*Pleurotus*) *tremulus*, *Schæff.*; pileus slightly fleshy, reniform, depressed, tough, even; stem marginal, distinct, nearly round, ascending, villous; gills adnate, determinate, linear, distant, grey.—*Sow. t.* 242.

Amongst moss, on Fungi, etc. Rare. Malvern Hills. Purton. Scotland, *Hooker*. Denbighshire, on Moelfre-uchaf. About 1 inch across. Grey. Stem attached to the matrix by a woolly mass.

189. A. (*Pleurotus*) *acerosus*, *Fr.*; pileus membranaceous, reniform, plane, striate, somewhat lobed, hygrophaneous; stem very short or obsolete, lateral, somewhat strigose at the base; gills determinate, linear, crowded, simple, grey.—*Bolt. t.* 72. *f.* 3.

On gravel, lawns, wood, etc. Rare. Hitcham, Suffolk, *Prof. Henslow*. A small grey species.

### III. *Pileus at first resupinate.*

#### \* *Pileus fleshy, uniform.*

190. A. (*Pleurotus*) *porrigens*, *P.*; white; pileus fleshy, tough, at first resupinate, then ascending from the extended base, ear-shaped, smooth above; gills very narrow, linear.

On old pine-trunks. Rare. Inverary, *Klotzsch*.

191. A. (*Pleurotus*) *septicus*, *P.*; white; pileus thin, slightly fleshy, resupinate, then reflected, even, pubescent; stem slender, incurved, pubescent, at length evanescent; springing from byssoid rootlets; gills distant.—*Sow. t.* 321.

On twigs, decayed Fungi, dung, etc. Not uncommon. Pure white, very variable in size and form, but always small.

\*\* *Pileus fleshy, with a gelatinous coat.*

192. A. (*Pleurotus*) *mastrucatus*, *Fr.*; pileus fleshy, upper stratum gelatinous, at first resupinate, then expanded, sessile, lobed, scaly; gills greyish-white.—*Sow. t.* 99.

On old trunks of trees. Rare. Pileus 1–4 inches across. Imbricated.

193. A. (*Pleurotus*) *atro-cæruleus*, *Fr.*; pileus fleshy, upper stratum gelatinous, at first resupinate, then obovato-reniform, tomentose; gills crowded, white, changing to yellow.

On trunks of trees. Rare. Penzance, *J. Ralfs, Esq.*

194. A. (*Pleurotus*) *algidus*, *Fr.*; pileus fleshy, with a thin gelatinous coat, at first resupinate, then expanded, reniform, smooth; gills rather wide, crowded, pale yellowish.

On trunks of trees. Linlithgowshire, *J. C. Bauchop*. About an inch across. Pileus reddish-umber or cinereous.

195. A. (*Pleurotus*) *Leightoni*, *B.*; pileus at first obliquely conical, umber, then lead-coloured, furfuraceous, with short scattered bristles intermixed; upper stratum gelatinous; gills rather thick, tan-coloured, distant, somewhat forked at the base, slightly undulated; interstices scarcely reticulated.

On wood. Montford-bridge, near Shrewsbury, *Rev. W. A. Leighton*. Pileus 5 lines broad.—*Ann. of Nat. Hist.* xiii. t. 9. f. 1.

196. A. (*Pleurotus*) *cyphellæformis*, *B.*; pileus cup-shaped, then dependent; upper stratum gelatinous, cinereous, very minutely strigose, especially at the base; margin paler sprinkled with a few meal-like scales; gills pure white, rather distant, narrow, linear.—*Mag. of Zool. and Bot.* i. t. 15. f. 3.

On dead stems of herbaceous plants. Minute. Allied to *A. applicatus*.

\*\*\* *Pileus membranaceous.*

197. A. (*Pleurotus*) *Hobsoni*, *B.*; pileus membranaceous,

reniform or dimidiate, stemless, pale grey, minutely downy ; gills rather distant, pallid.

On larch-stumps. Apethorpe. Sept. 1859. Pileus 1-4 lines across ; margin involute. Named after Licut. Julian C. Hobson, who has sent several interesting Fungi from the neighbourhood of Poona.

198. **A.** (*Pleurotus*) *applicatus*, *Batsch* ; dark, cinereous ; pileus rather firm, somewhat membranaceous, resupinate, then reflected, somewhat striate, subpruinose, strigose behind ; gills loose, paler.—*Sow. t.* 301.

On dead fallen branches in woods. Extremely common. About one-third of an inch across.

199. **A.** (*Pleurotus*) *striatulus*, *Fr.* ; pale cinereous ; pileus very delicate, striate, flaccid, smooth ; gills few, distant.

On fir-wood, hazel-twigs, etc. Scotland, *Capt. Carmichael*.

200. **A.** (*Pleurotus*) *hypnophilus*, *P.* ; resupinate, flat, white ; pileus subreniform, nearly smooth ; gills simple.—*Pers. Myc. Eur. iii. t.* 24. *f.* 5 *a.*

On the larger mosses and fallen leaves. Appin, *Capt. Carmichael*.

201. **A.** (*Pleurotus*) *chioneus*, *P.* ; snow-white, subresupinate, minute ; pileus very thin, villous ; gills rather broad ; stem very short, villous, at length obsolete.—*Pers. l. c. t.* 26. *f.* 10, 11.

On wood or dung. Rare. Lytchett, Dorsetshire. Allied to *A. septicus*, and differing in its very thin pileus.

Series 2. HYPORRHODII.—*Spores salmon-coloured.*

Subgenus 10. VOLVARIA.—Veil universal, forming a volva distinct from the cuticle. Hymenophorum distinct from the stem.

\* *Silky or fibrillose.*

202. **A.** (*Volvaria*) *bombycinus*, *Schæff.* ; pileus soft, fleshy,

campanulate, then expanded, self-coloured, clothed with silky threads; stem solid, attenuated, smooth; volva very large, dark externally; gills free, flesh-coloured. (Plate 7, fig. 1.)

On decayed wood. Rare. Pileus 3-4 inches across; volva lobed.

203. *A. (Volvaria) volvaceus*, *Bull.*; pileus soft, fleshy, campanulate, then expanded, obtuse, virgate, with little close-pressed, black fibres; stem solid, nearly equal; volva loose gills free, flesh-coloured.—*Sow. t. 1.*

In stoves, on the sides of roads, etc. Rare in the latter situation. Pileus 3-4 inches across.

204. *A. (Volvaria) Loveianus*, *B.*; pileus thin, fleshy, subtruncate, globose, then convex, obtuse, white, silky; stem solid, attenuated upwards; volva loose, lobed; gills free, rose-coloured. (Plate 7, fig. 2.)

Parasitic on *Ag. nebularis*. Very rare. Cæspitose. Pileus 2½ inches across. This is *A. surrectus*, Knapp in Journ. of a Nat.

205. *A. (Volvaria) Taylora*, *B.*; pileus thin, conical, obtuse, livid, striato-rimose from the apex; stem pale, solid, nearly equal; volva lobed, brown, small; gills uneven, broad in front, attenuated behind, rose-coloured.

On the ground. Jersey, *Michael Angelo Taylor, Esq.* Remarkable for its attenuated, unequal gills.

206. *A. (Volvaria) pusillus*, *Fr.*; pileus subcampanulate, submembranaeous, silky, slightly viscid; stem nearly equal, solid; volva small, lobed; gills free, rose-coloured.—*Bull. t. 330.*

In pastures after stormy weather. Common. Very variable in size, from a few lines to 2 inches; white, sometimes tinged with yellow or brown. Stem smooth or squamulose. Exactly the plant of Bulliard. Whether it is the same with *A. parvulus*, *Fr.*, is not so clear. Slightly viscid when moist.

\*\* *Pileus smooth, viscid.*

207. A. (*Volvaria*) *speciosus*, *Fr.*; pileus soft, fleshy, campanulate, then expanded, obtuse, smooth, even, viscid; disc grey; stem solid, somewhat bulbous, attenuated upwards, villous as well as the loose volva. (Plate 7, fig. 3.)

On dunghills, roadsides, etc. Rare. Pileus 2-3 inches across.

Subgenus 11. PLUTEUS.—Hymenophorum distinct from the stem.  
Veil none.

208. A. (*Pluteus*) *cervinus*, *Schæff.*; pileus fleshy, campanulate, then expanded, smooth, then breaking up into little fibres or scales; margin naked; stem solid, rough with black fibrillæ; gills crowded, free, white, then flesh-coloured.—*Sow. t.* 108.

On trunks of trees. Not uncommon. Pileus 2-3 inches across.

209. A. (*Pluteus*) *umbrinus*, *Fr.*; pileus fleshy, campanulate, then expanded, lacunose at first; margin ciliato-fimbriate; stem solid, villososquamoso; gills free; margin fimbriate.—*Pers. Ic. et descr. t.* 2. *f.* 5, 6.

On dead trunks. Coed Coch. My form is just that of Persoon.

210. A. (*Pluteus*) *nanus*, *P.*; pileus slightly fleshy, convexo-plane, rugulose, sprinkled with dingy meal; stem solid, rigid, short, striate, white; gills free, white, then flesh-coloured.—*Bull. t.* 547. *f.* 3.

On fallen sticks. Wothorpe, Norths. Pileus about 1 inch across.

211. A. (*Pluteus*) *petasatus*, *Fr.*; pileus fleshy in the centre, campanulate, then expanded, umbonate, quite smooth, viscid, with a separable cuticle, membranaceous half-way up, and at

length striate; stem tall, solid, rigid, fibrilloso-striate, attenuated upwards; gills very broad, free, crowded, drying up, white, then reddish.—*Ann. of Nat. Hist.* xiii. pl. 9. f. 2.

On sawdust, in England, Scotland (*Lady Orde*), and Wales, but not common.

212. **A.** (*Pluteus*) *leoninus*, *Schæff.*; pileus submembranaceous, campanulate, then expanded, smooth, naked, margin striate; stem solid, smooth, striate; gills free, yellow, then flesh-coloured. (Plate 7, fig. 4.)

On wood. Rare. Pileus often of the most brilliant orange.

213. (**A.** *Pluteus*) *chrysophæus*, *Schæff.*; pileus submembranaceous, campanulate, then expanded, naked, nearly even, smooth or somewhat virgate, margin striate; stem smooth; gills free, white, then flesh-coloured. (Plate 7, fig. 5.)

On wood, hollow trees, etc. Not uncommon. Pileus dingy, 2 inches or more across. Stem white or yellowish, solid in my specimens, but hollow according to Fries.

214. **A.** (*Pluteus*) *phlebophorus*, *Dittm.*; pileus slightly fleshy, convex, expanded, marked with prominent veins, naked, margin even; stem fistulose, smooth, incurved, shining; gills free, white, then flesh-coloured.

On fallen sticks. Rare. Pileus about an inch broad. A very beautiful species.

Subgenus 12. **ENTOLOMA**.—Hymenophorum continuous with the fleshy or fibrous stem; gills sinuato-adnexed, or parting from the stem.

215. **A.** (*Entoloma*) *fertilis*, *P.*; pileus smooth, pulverulento-squamulose, dry, fleshy, obtuse; stem fibrillose, subsquamulose, somewhat bulbous; gills flesh-coloured, adnexed.—*Bull. t.* 590, 547. f. 1.

In woods. Smell like that of fresh meal. Pileus 4 inches

or more across, of a pinkish-buff. Exactly the plant of Bulliard. *A. sinuatus*, Fr., under which Bulliard's figures are quoted, must be different.

216. *A. (Entoloma) prunuloides*, Fr.; pileus fleshy, campanulate, then expanded, umbonate, even, smooth, slightly viscid; stem solid, unequal, smooth, somewhat striate, white; gills free, white, then flesh-coloured, ventricose.

On the ground. Rare. Mossburnford, *A. Jerdon*, Esq. Gills emarginate. Smell farinaceous.

217. *A. (Entoloma) Placenta*, Batsch; pileus fleshy, convex expanded, umbonate, regular, smooth, brown as well as the solid, equal, fibroso-striate stem; gills emarginate, adnexed, crowded, rather thick, pallid flesh-colour.—*Batsch*, f. 18.

On the ground. Swanage, *C. E. Broome*.

218. *A. (Entoloma) Elodes*, Fr.; pileus slightly fleshy, convexo-plane, somewhat umbonate, moist, becoming smooth; stem hollow, pallid, fibrillose, thickened at the base; gills emarginate, adnexed, rather distant, white, then flesh-coloured.

On moors. Coed Coch. Smell like that of new meal. Pileus purple, dingy-brown, etc.

219. *A. (Entoloma) repandus*, Bull.; pileus fleshy, conical, umbonate, indistinctly silky; margin lobed; stem short, solid, minutely silky, white; gills dull rose-coloured, broad in front.—*Bull. t.* 423. *f.* 2.

Amongst grass. Rare. Pileus 1-2 inches across. Smell like that of fresh meal. Certainly not the plant of Fries.

220. *A. (Entoloma) Bloxami*, B. and Br.; pileus compact, campanulate, obtuse, somewhat lobed, moist, blackish-blue, somewhat silky; flesh white; stem slightly attenuated upwards, obtuse at the base; gills rather broad, attenuated, adnexed.

In open, exposed pastures. Not uncommon. Pileus 1 inch or more across.

221. A. (*Entoloma*) *ardosiacus*, *Bull.*; brittle; pileus slightly fleshy, convex, then expanded and depressed, even, smooth, moist; stem hollow, elongated, steel-blue, attenuated from the white base; gills nearly free, crowded, greyish flesh-coloured. *Bull. t.* 348.

In moist meadows. A doubtful native, introduced on the authority of Sibthorpe.

222. A. (*Entoloma*) *frumentaceus*, *Bull.*; pileus fleshy, firm, rather brittle, nearly plane, dry, finely streaked; stem streaked and slightly cracked, obtuse at the base; gills broad, emarginate or rounded behind, cinereous, with a reddish-yellow tinge.—*Bull. t.* 571. *f.* 1.

On the ground, under a hedge. Rare. Woodnewton, Northamptonshire. Pileus  $3\frac{1}{2}$  inches across, buff, tinged with red as well as the stem.

223. A. (*Entoloma*) *sericellus*, *Fr.*; pileus slightly fleshy, convexo-plane or depressed, silky, at length squamulose; stem subfistulose, fibrillose, white, becoming pallid; gills adnate, seceding, slightly distant, white, then flesh-coloured.

In woods. Not uncommon. Resembling Persoon's figure, *Ic. t.* 6. *f.* 2, quoted doubtfully by Fries, but not exceeding an inch in diameter. Pileus and stem white. Stem solid or densely stuffed, never fistulose in the British plant.

\*\* *Pileus hygrophanous.*

224. A. (*Entoloma*) *clypeatus*, *L.*; pileus slightly fleshy, campanulate, then expanded, umbonate, somewhat virgate, smooth, hygrophanous; stem stuffed, attenuated, fibrillose, becoming pallid; gills rounded behind, adnexed, seceding, serrulate, of a dirty flesh-colour.—*Huss. ii. t.* 42.

In gardens, etc. Not uncommon. Pileus 4 inches or more across.

225. **A.** (*Entoloma*) *rhodopolius*, *Fr.*; pileus slightly fleshy, campanulate, then expanded, at length slightly depressed, hygrophanous; margin flexuous; stem hollow, nearly equal, smooth, white, pruinose above; gills sinuated, adnate, white, then rose-coloured. (Plate 7, fig. 6.)

In woods, etc. Not uncommon. Pileus about 3 inches across. Smell like that of fresh meal.

226. **A.** (*Entoloma*) *costatus*, *Fr.*; pileus thin, convexobullate, then nearly flat, subumbilicate, undulated, smooth, hygrophanous; stem hollow, short, irregular, somewhat striate, grey, with a few little white scales above; gills quite entire, nearly free, transversely ribbed, pallid.

In meadows. Very common. Pileus 2 inches or more across.

227. **A.** (*Entoloma*) *sericeus*, *Bull.*; pileus carnosomembranaceous, convex, expanded, smooth, hygrophanous, silky when dry; margin inflected, waved, slightly striate; stem short, fistulose, fibrillose; gills emarginate, plane, rather distant, greyish.—*Bull. t.* 413. *f.* 1.

In meadows. Not uncommon. Smell like that of meal. In part *A. pascuus*, Eng. Fl.

228. **A.** (*Entoloma*) *nidorosus*, *Fr.*; pileus carnosomembranaceous, convex, expanded, somewhat depressed, smooth, hygrophanous, when dry shining with a silky lustre; stem equal, smooth, white, becoming pallid, pruinose above; gills emarginate, separating from the stem, broad, somewhat distant, flexuous, slightly discoloured.

In woods. Common. Pileus from 1½ to 3 inches across. Smell strong, nitrous. This is *A. rhodopolius* of Eng. Fl.

Subgenus 13. *CLITOPILUS*.—Hymenophorum confluent with the fleshy or fibrous stem; gills decurrent.

229. **A.** (*Clitopilus*) *prunulus*, *Scop.*; pileus fleshy, com-

pect, at first convex, regular, at length depressed, waved, pruinose, dry; stem solid, ventricose, naked, striate; gills deeply decurrent, rather distant, white, then flesh-coloured.—(Plate 7, fig. 7.)—*Huss.* ii. t. 47.

In woods. White, or slightly cinereous. Smell like that of new meal. Esculent.

230. *A.* (*Clitopilus*) *mundulus*, *Lasch*; pileus fleshy, thin, tough, plano-depressed, unequal, polished, dry; stem stuffed, slender, flocculose, thickened at either end, at length black within; gills deeply decurrent, very crowded, narrow, pallid.—*A. nigrescens*, *Lasch*, n. 521.

In woods. Scotland, *Klotzsch*. King's Cliffe. *A. carneo-albus*, *With.*, is very doubtful.

Subgenus 14. LEPTONIA. — Stem with a cartilaginous bark.

Margin of pileus at first incurved; gills separating from the stem.

231. *A.* (*Leptonia*) *lampropus*, *Fr.*; pileus slightly fleshy, obtuse, convex, flattened, not striate, at length depressed, squamulose, broken up into flocci; stem subfistulose, even, unspotted, steel-violet; gills adnate, ventricose, at first dirty-white.

In pastures. Not uncommon. Pileus  $1\frac{1}{2}$  inch across.

232. *A.* (*Leptonia*) *serrulatus*, *P.*; pileus carnosomembranaceous, hemispherical, then expanded, umbilicate, subsquamose, stem fistulose, smooth, black, dotted above, gills adnate, separating, broad at first, bluish, then greyish flesh-coloured, edge black, finely notched.

In woods. Rare. Wothorpe, etc. Stem sometimes grey. Easily distinguished by the serrate edge of the gills.

233. *A.* (*Leptonia*) *euchrous*, *P.*; pileus slightly fleshy, campanulate, then convex, obtuse, squamuloso-fibrillose; stem

stuffed, smooth, violet; gills adnexed, ventricose, violet, edge entire, darker.—*Pers. Syn. p.* 343.

On alder-trunks. Rare. Mossburnford, *A. Jerdon*. Gills smalt-blue when young. Cæspitose, not an inch across.

234. **A. (Leptonia) chalybæus**, *P.*; pileus slightly fleshy, convex, subumbonate, not striate, at first flocculose, then squamulose; stem stuffed, smooth, blue; gills emarginate, adnexed, broad, ventricose, at first of a glaucous dirty-white, edge darker. *Sow. t.* 161.

In pastures. Not uncommon. Pileus  $\frac{1}{2}$ –1 inch broad.

235. **A. (Leptonia) incanus**, *Fr.*; pileus submembranaceous, convexo-plane, umbilicate, smooth, with a silky lustre, or virgate, margin striate; stem fistulose, shining, smooth, brownish-green; gills adnate, separating from the stem, broad, rather distant, white, then greenish.—*Sow. t.* 162.

In pastures. Not uncommon. Smell exactly like that of mice. Stem often with beautiful verdigris-coloured down at the base.—*A. Sowerbeii*, Eng. Fl.

236. **A. (Leptonia) asprellus**, *Fr.*; pileus submembranaceous, convex, flattened, striate, hygrophanous, umbilicus darker, squamuloso-fibrillose; stem fistulose, slender, smooth; gills adnate, separating from the stem, rather distant, equally attenuated, whitish-grey.

In open pastures. Rare. Bristol, *H. O. Stephens*. Wausford.

Subgenus 15. **NOLANEA**.—Stem cartilaginous. Margin of pileus at first straight, pressed to the stem.

237. **A. (Nolanea) pascuus**, *P.*; pileus membranaceous, conical, expanded, subumbonate, smooth, striate, hygrophanous, when dry shining like silk; stem fistulose, brittle, striate,

fibrous; gills attenuated behind, nearly free, ventricose, crowded, dirty-greyish.—*Bolt. t.* 35.

In pastures. Not uncommon. Inodorous. Stem compressed, splitting.

238. A. (*Nolanea*) *rufo-carneus*, *B.*; pileus submembranaceous, hemispherical, umbilicate, indistinctly fibrilloso-squamulose, red-brown; margin striate; stem elongated, pale rufous, rather incrassated at the base; gills adnate, ventricose, attenuated behind, slightly connected and traversed by veins.—*Eng. Fl. v. pt. 2. p.* 82.

On heaths. Dorset. Pileus 1 inch across; stem  $2\frac{1}{2}$  inches high. Taste rather bitter.

239. A. (*Nolanea*) *rubidus*, *B.*; pileus membranaceous, convex, at length umbilicate, finely silky; stem short, thickest above, solid, minutely silky; gills broad, ventricose, adnate, attenuated behind, sometimes subdecurrent, whitish, then rose-coloured.—*Mag. Zool. and Bot. i. t. 2. f.* 2.

In stoves. Milton. Pileus one-third of an inch across; stem  $1\frac{1}{2}$ –2 lines high, white or greyish. Smell like that of new flour.

240. A. (*Nolanea*) *Babingtonii*, *Blox.*; pileus conico-campulate, cinereous, shining like silk, adorned with dark brown subfasciulate fibres, which are free at one end; stem equal, fistulose, clothed with dark brown down, substrigose; gills ventricose, distant, cinereous, darker at the base, adnate, glittering with little points.—*Ann. of Nat. Hist. v. xiii. ser. ii. p.* 400.

Rare. Twycross, *Rev. A. Bloxam*. Occurs also in Pennsylvania. Pileus scarcely half an inch across.

No species of the subgenus *Eccilia* has yet occurred in Great Britain.

Series 3.—DERMINI. *Spores ferruginous, sometimes tawny or brownish.\**

Subgenus 16. PHOLIOTA.—Stem furnished with a ring.

241. A. (*Pholiota*) *aureus*, *Mathusk.*; pileus fleshy, convex, obtuse, sprinkled with innate hairy scales; stem solid, nearly equal; ring narrow, spreading; gills emarginate, olivaceous, then ferruginous.—*Sow. t. 77; Huss. i. t. 71.*

On dead stumps. Not uncommon. Spores ferruginous. Pileus 4 inches across, of a golden-tawny; gills rounded behind, and decurrent in the same group of specimens; stem minutely squamulose above, fibrillose below, not smooth as in the character of Fries. Taste bitter.—*See Observations in Eng. Fl.*

242. A. (*Pholiota*) *durus*, *Bolt.*; pileus somewhat compact, convexo-plane, smooth, at length cracked into little areas; margin even; stem stuffed, hard, fibrous externally, rather thickened above and mealy; ring more or less torn; gills adnate, ventricose, livid, then of a brown-rust colour.—*Bolt. t. 67. f. 1.*

In gardens, *Bolton*. Brighton, *Dr. Badham*. Pileus pale tawny, or brownish-tan.

243. A. (*Pholiota*) *præcox*, *P.*; pileus soft, fleshy, convexo-plane, obtuse, even, at length smooth; stem stuffed, then hollow, cylindric, farinoso-pubescent, at length smooth, white, as well as the entire ring; gills emarginate, adnexed, crowded, white, at length brownish. (Plate 8, fig. 1.)

In gardens and pastures. Spring. Common. About two inches across. Ring striate above. Paler than the last, but it is very doubtful whether it is really distinct.

\* The *Cortinariæ* have red-ochraceous spores (peroxide of iron), and a veil consisting of spider-web threads.

244. A. (*Pholiota*) *radicosus*, *Bull.*; pileus fleshy, equal, obtuse, at first shining spotted with adpressed scales; stem solid, rooting, mealy above the distant ring, concentrically scaly below; gills ventricose, pallid, then reddish-brown.—*Bull. t.* 160.

In woods. Not uncommon. Pileus 3 inches or more across, of a dirty pale-ochre; gills adnate, but free according to Fries, whose character is perhaps taken from Bulliard. Smell like that of prussic acid.

245. A. (*Pholiota*) *pudicus*, *Bull.*; pileus fleshy, convex, then expanded, obtuse, dry, smooth; stem solid, nearly equal, even; ring spreading, persistent; gills rounded behind, adnexed, ventricose, whitish, then tawny.—*Huss. ii. t.* 31.

On elder-trunks, etc. Not common. Canterbury, etc. Pileus sometimes rivulose, dirty-white. Esculent.

246. A. (*Pholiota*) *comosus*, *Fr.*; pileus fleshy, convex, obtuse, viscid, sprinkled with evanescent, superficial, floccose scales; stem solid, somewhat bulbous, white, as well as the evanescent floccose ring; gills quite entire, subdecurrent, white, then of a brownish clay-colour.—*Bolt. t.* 42.

On trunks. I know nothing of this species.

247. A. (*Pholiota*) *aurivellus*, *Batsch*; pileus fleshy, campanulate at first, then convex, gibbous, slightly viscid, variegated with close-pressed darker scales; stem stuffed, nearly equal, curved, sprinkled with brownish, ferruginous, close-pressed scales; ring rather distant; gills sinuated behind, fixed, white, then straw-coloured, and finally ferruginous.—*Batsch, f.* 115.

On trunks of trees. Rare. Pileus tawny, 3 inches across.

248. A. (*Pholiota*) *squarrosus*, *Müll.*; pileus fleshy, campanulate, then convex, expanded, dry, rough with squarrose, crowded, innate, dark, revolute scales, as well as the attenuated

stem ; gills subdecurrent, crowded, narrow, pale olive, then ferruginous.—*Sow. t. 284* ; *Huss. i. t. 8.*

On trunks of trees. Very common. Cæspitose. Pileus brownish-tawny, 3 inches across. Very handsome. There are one or two varieties with less squarrose scales.

249. A. (*Pholiota*) *adiposus*, *Fr.* ; pileus compact, convexo-plane, obtuse, yellow, glutinous, and rough with superficial, evanescent, concentric, darker scales, as well as the stuffed, somewhat bulbous stem ; gills adnate, broad, yellow, then ferruginous. (Plate 8, fig. 2.)

On beech and ash trunks. Extremely beautiful, growing in large tufts ; coloured like a ripe pine-apple.

250. A. (*Pholiota*) *flammans*, *Fr.* ; pileus fleshy, convexo-plane, somewhat umbonate, dry, clothed with superficial, hairy, paler scales ; stem stuffed, then hollow, equal, somewhat flexuous, rough with scales ; ring entire, yellow, as well as the fixed, crowded, very entire gills.

In pine-woods. Scotland. Pileus tawny, scales yellow. A very pretty species.

251. A. (*Pholiota*) *mutabilis*, *Schæff.* ; pileus fleshy, convex, then flattened out, turning pale ; margin thin ; stem rigid, stuffed, then hollow, rough with scales, dark brown at the base ; gills adnato-decurrent, crowded, pale, then cinnamon. (Plate 8, fig. 3.)—*Huss. ii. t. 27.*

On trunks of trees, especially lime-stumps, or on the ground. Not uncommon. The changeable, smooth, cinnamon-coloured pileus easily distinguishes this species, which varies much in size.

252. A. (*Pholiota*) *marginatus*, *Batsch* ; pileus slightly fleshy, convex, expanded, smooth, moist, hygrophonous ; margin striate ; stem fistulose, soft, not scaly, pruinose above the fugitive ring, darker at the base, and clothed with white

velvety down; gills adnate, crowded, watery cinnamon.—*Batsch, f. 207.*

On the ground, especially amongst firs. Common.

253. **A.** (*Pholiota*) *pumilus*, *Fr.*; pileus slightly fleshy, hemispherical, obtuse, even; stem fistulose, thin, subfibrillose, ring rather fugacious; gills adnate, crowded, broad, yellowish.

In woods. Rare. Wothorpe, October 1859. Pileus only a few lines broad, yellowish.

254. **A.** (*Pholiota*) *mycenoides*, *Fr.*; pileus membranaceous, campanulate, then convex, deeply striate, hygrophanous, smooth, as well as the fistulose, slender, ferruginous stem; ring membranaceous, white; gills adnate, rather distant, ferruginous.—*Ann. Nat. Hist. ser. ii. vol. ii. p. 261. t. 9. f. 1* (*A. mesodactylius*).

On the ground, in damp dells. Rare. My plant has a white stem, but, as Fries considers it the same with his *A. mycenoides*, I am content to follow his views.

255. **A.** (*Pholiota*) *Leveillianus*, *Doz. and Molk.*; hard, fleshy, thin, convex, umbonate, clothed with a glutinous, dark brown, opaque pellicle, at length wrinkled and paler when dry; stem hollow, nearly equal, fibrilloso-squamose below the ring, white, with a reddish tinge; gills broad, adnate, decurrent, white, then pink, at length rufous.—*A. jecorinus, B. and Br. l. c. p. 260.*

On soil. Rare. Rushton, Northamptonshire. About 1½–2 inches across.

Subgenus 17. **HEBELOMA**.—Veil, if present, floccose, not interwoven. Stem fleshy; gills sinuated.

1. *Cuticle fibrous, dry.*

\* *Pileus squarrose; stem scaly, dark.*

256. **A.** (*Hebeloma*) *relicinus*, *Fr.*; pileus fleshy, thin, co-

nical, then expanded, obtuse, rough with tomentose scales; stem solid, soft, equal, floccoso-squamose; gills adnexed, crowded, yellow, then dingy-olive.

In marshy fir-woods, amongst *Sphagna*. Kinnordy, *Klotzsch*. Pileus 1 inch across.

257. A. (*Hebeloma*) *lanuginosus*, *Fr.*; pileus fleshy, hemispherical, expanded, obtuse, floccoso-squamose, the scales of the disc erect and sharp; stem thin, solid, squamoso-fibrillose, clothed with white dust above; gills thin, separating, toothed, of a pallid clay-colour. Pileus umber, inclining to yellow.—*Bull. t.* 370.

On the ground. Not common. The gills in Bulliard's plate are represented as reddish, but in the text they are described as "fuligineo-ferruginæ."

258. A. (*Hebeloma*) *plumosus*, *Bolt.*; pileus slightly fleshy, convexo-plane; disc squarrose, with erect, fasciculate hairs; margin fibrillose; stem stuffed, then hollow, slender, flexuous, flocculoso-squarrose, naked above; gills subadnate, scarcely crowded, ventricose, quite entire, dingy.—*Bolt. t.* 33.

In moist pine-woods. I have not met with this species.

\*\* *Pileus scaly; stem fibrillose, paler than the pileus.*

259. A. (*Hebeloma*) *pyriodorus*, *P.*; pileus fleshy, conical, then expanded, umbonate, clothed with adpressed, fibrous scales; stem stuffed, firm, equal, fibrillose from the remains of the veil; pruinose and pale above; gills emarginate, rather distant, dirty-white, then reddish-brown.

In woods. Not uncommon. Smell like that of decaying pears. Pileus 2 inches across, pale brownish-ochre.

260. A. (*Hebeloma*) *scaber*, *Müll.*; pileus fleshy, conical, then obtusely gibbous, sprinkled with close-pressed fibrous scales; stem thick, solid, equal, clothed with silky threads, veiled; gills adnexed, crowded, dingy.—*Sow. t.* 207.

In woods. Not common. Pileus  $1\frac{1}{2}$  inch across, dingy.

261. A. (*Hebeloma*) *lacerus*, *Fr.*; pileus somewhat fleshy, convex, expanded, obtusely umbonate, clothed with little fibrillose scales; stem stuffed, thin, short, fibrillose, naked above, red within; gills adnexed, broad, ventricose, white, tinged with red, then mouse-coloured.

On the naked ground, in woods. Not uncommon.

262. A. (*Hebeloma*) *floeculosus*, *B.*; pileus subcarnose, convex, subcampanulate, umbonate, sericeo-squamulose; stem fibrillose, squamuloso-pulverulent above; gills pale fawn-coloured, then obscurely ferruginous, ventricose, adnate.—*Eng. Fl. l. c. p. 97.*

On the naked soil, and amongst grass. Rare. Smell like that of new meal. Pileus 1 inch across, brownish-fawn. Amongst grass the pileus is smoother, more tawny, and the gills broadly adnate.

263. A. (*Hebeloma*) *Hookeri*, *Klotzsch*; pileus submembranaceous, obtuse, umbonate, clothed with branny scales; stem shining, purple, pruinose with fawn-coloured meal; gills purple, at length cinnamon, adnexed.—*Eng. Fl. l. c.*

In garden-pots. Glasgow, *Dr. J. D. Hooker*. Pileus 5–8 lines across, fawn-coloured.

264. A. (*Hebeloma*) *obscurus*, *P.*; pileus somewhat fleshy, flatly campanulate, umbonate, longitudinally fibrillose; disc scaly; stem stuffed, somewhat flexuous, fibrillose, violet-brown; gills adnexed, uncinat, crowded, ventricose, olive, then brown.

On the naked ground. East Bergholt, *Dr. Badham*. Pileus scarcely an inch across.

\*\*\* *Pileus rimose*; stem whitish, slightly tinged with the colour of the pileus, fibrillose.

265. A. (*Hebeloma*) *fibrosus*, *Sow.*; pileus fleshy, thin, ob-

tusely campanulate, silky, even, at length cracked; margin flexuous, broken; stem long, solid, striate, squamoso-flocculose above; gills free, crowded, linear-lanceolate, dirty-white.—*Sow. t.* 414.

In fir-woods. Keynston, Dorsetshire, *Miss Rackett*. Fries refers *A. repandus*, Bull., to this species. Pileus 4 inches across. Stem 1 inch thick.

266. *A.* (*Hebeloma*) *fastigiatus*, *Fr.*; pileus fleshy, thin, conico-campanulate, longitudinally fibrous, cracked; stem solid, stout, rather twisted, finely fibrillose; gills crowded, free, yellow, then brownish-olive; spores rough. (Plate 8, fig. 4.)

In woods. Rare. King's Cliffe. June. Pileus 2 inches across, yellow-brown. Stem attenuated upwards. Spores rough with little nodules.

267. *A.* (*Hebeloma*) *Curreyi*, *B.*; pileus convex, expanded longitudinally, fibrous, slightly cracked, not umbonate; stem straight, attenuated upwards, finely fibrillose; gills yellowish, then brownish-olive, free; spores perfectly even.

In woods. Fineshade, Northamptonshire, Aug. 8. Closely resembling the last, but by no means umbonate. The stem is dark, and the spores, which are subcymbiform, perfectly even.

268. *A.* (*Hebeloma*) *rimosus*, *Bull.*; pileus thin, fleshy, campanulate, fibrous, expanded longitudinally, rimose; stem solid, firm, nearly smooth, bulbous, mealy above; gills free, somewhat ventricose, brownish clay-coloured. (Plate 8, fig. 5.)

On the ground, in woods. Extremely common. Pileus brownish, with a yellow tint. There are several varieties, in some of which the stem is white, in others coloured like the pileus.

269. *A.* (*Hebeloma*) *auricomus*, *Batsch*; small, thin; pileus yellowish, striate, much cracked; stem fistulose; gills

fixed, ventricose, dirty-white, changing to brown.—*Batsch*, f. 21.

In woods. Not uncommon.

270. *A.* (*Hebeloma*) *trechisporus*, *B.*; pileus submembranaceous, convex, strongly umbonate, at first viscid, but soon dry and silky; stem slightly striate and mealy; gills ventricose, emarginate, scarcely adnate, pinkish-grey; spores rough. (Plate 8, fig. 6.)

In woods, amongst fern. Not common. About 1 inch across, tawny. The spores are like those of *A. fastigiatus* and *lacerus*.

\*\*\*\* *Pileus not rimose; disc even; stem polished, white.*

271. *A.* (*Hebeloma*) *sindonium*, *Fr.*; pileus fleshy, thin, conico-convex, gibbous, obtuse, clothed with velvety down; veil more or less appendiculate; stem with a distinct pith, at length hollow and smooth; gills attenuated, adnexed, lanceolate, dirty-white, becoming brown.—*Sow. t.* 365 (*a large form*).

In moist shady places. Rare. Pileus at length smooth.

272. *A.* (*Hebeloma*) *geophyllum*, *Sow.*; pileus somewhat fleshy, conical, then expanded, umbonate, even, silky; stem stuffed, equal, rather firm, white; veil fibrillose; gills crowded, adnexed, white, then dingy, then earth-coloured.—*Sow. t.* 124.

On the ground, in woods. Extremely common. About an inch across. Pileus white, lilac, etc.

273. *A.* (*Hebeloma*) *lucifugus*, *Fr.*; pileus rather fleshy, convexo-plane, somewhat umbonate, clothed with little close-pressed fibres or scales; stem firm, solid, equal, smooth, somewhat pruinose above; gills nearly free, crowded, plane, of a dirty yellowish-white, then olive.—*Pers. Ic. Pict. t.* 15.f. 2.

On the ground, in woods. Not uncommon. Pileus about an inch across, brownish or olive.

2. *Cuticle smooth, forming a distinct pellicle.*

274. A. (*Hebeloma*) *testaceus*, *Batsch*; pileus fleshy, campanulato-convex, obtuse, even, slightly viscid; stems hollow, somewhat bulbous, flocculoso-fibrillose, pale, mealy above; gills attenuated, nearly free, lanceolate, crowded, pale, then ferruginous, ascending.—*Batsch*, *f.* 198.

In woods. Coed Coch, *Mrs. Wynne*. Pileus 2–3 inches across, reddish. Smell very strong. This is the only species of the veiled *Fastibiles* which has occurred in this country.

275. A. (*Hebeloma*) *crustuliniformis*, *Bull.*; pileus fleshy, convex, at length plane, rather waved, smooth, somewhat viscid; stem stuffed, firm, somewhat bulbous, dirty-white, clothed more or less with little floccose scales; gills crowded, thin, annexed, dirty-white, then of a watery cinnamon; edge crenulate, guttate. (Plate 9, fig. 1.)—*Bull. t.* 308, 546.

In woods. Extremely common. Forming large rings. Smell like that of the flowers of the common laurel. *A. planus*, Sow., is apparently a small form of this species.

276. A. (*Hebeloma*) *longicaudus*, *P.*; pileus fleshy, convex, expanded, even, smooth, viscid; stem rather hollow, brittle, nearly equal, white, mealy above; gills emarginate, crowded, serrulate, dry, of a pale clay-colour. (Plate 9, fig. 2.)

In woods. Not common. Pileus pale.

Subgenus 18. FLAMMULA.—Stem fleshy; gills adnate or decurrent.

277. A. (*Flammula*) *scambus*, *Fr.*; pileus rather fleshy, convexo-plane and slightly depressed, floccoso-villous, viscid

in moist weather; stem short, incurved, white, flocculose, and veiled, attenuated below; gills subdecurrent, of a yellowish clay-colour.

On larch. Flintham, Notts. Pileus about  $1\frac{1}{2}$  inch across. Stem at length ferruginous. Bolton's t. 55 is referred by Fries to *A. rinosus*, but it is surely *Paxillus involutus*.

278. A. (*Flammula*) *lentus*, *P.*; pileus fleshy, convexo-plane, even, viscid, at first clothed with a few evanescent scales; stem long, equal, scaly; gills adnate, dirty-white, then clay-coloured.

On stumps. Not uncommon in the north. Pileus and stem dirty-white.

279. A. (*Flammula*) *flavidus*, *Schæff.*; pileus fleshy, convexo-plane, equal, smooth, moist; stem somewhat hollow, fibrillose, yellow, then ferruginous; gills adnate, yellow, then ferruginous.—*Schæff. t. 35.*

On trunks of fir-trees, etc. Abundant on lime. Northamptonshire. Remarkable for its fine yellow tints. Spores bright ferruginous.

280. A. (*Flammula*) *inopus*, *Fr.*; pileus thin, fleshy, convexo-plane, moist, smooth; stem fistulose, thin, flexuous, closely fibrillose, at length brick-red below; gills adnate, crowded, linear, of a dingy whitish-yellow.—*Bolt. t. 148.*

On pine-trunks. Introduced on the authority of Fries's quotation of Bolton. He also thinks that *A. hybridus*, Sow., may be the same species.

281. A. (*Flammula*) *hybridus*, *Fr.*; pileus fleshy, hemispherical, expanded, obtuse, smooth, even, moist; stem stuffed with soft tissue, attenuated above, tawny, clothed with a whitish veil which forms a ring; gills adnate, rather crowded, pale yellow, inclining to tawny.

On fir-stumps. Gopsall, *Rev. A. Bloxam*. This does not

seem to be *A. hybridus*, Sow., whose affinities are doubtful. It is the only species of the pine-borne *Flammulæ* that has been sent me as British, but it is probable that one or two occur in Scotland.

Subgenus 19. NAUCORIA.—Stem cartilaginous externally; margin more or less convex; pileus inflexed.

\* *Pileus smooth; spores of a bright ferruginous tint.*

282. A. (Naucoria) *Cucumis*, *P.*; pileus slightly fleshy, broadly campanulate, smooth, turning pale; stem slender, firm, smooth, dark-brown, thickened at the tip, subpruinose; gills slightly annexed, ventricose, pallid, saffron-yellow.—*Sow. t. 344.*

Amongst sawdust, etc. Not very uncommon. The dark-brown stem, buff gills, and fishy smell, easily distinguish this curious species.

283. A. (Naucoria) *Centunculus*, *Fr.*; pileus slightly fleshy, convexo-plane, dingy-greenish, then yellowish, turning pale; stem fistulose, clothed with white down at the base, sprinkled with white meal above, cinereous-yellow, as well as the broad, thick, adnate, seceding gills.

On rotten wood. Rare. Apethorpe. Pileus only a few lines across. Gregarious.

284. A. (Naucoria) *horizontalis*, *Bull.*; pileus slightly fleshy, plano-convex, obtuse, even, smooth, watery-cinnamon, as well as the very short, incurved, naked stem, and rounded, free, plane gills.—*Sow. t. 341.*

On trunks of elms. Rare. Burghley Park, etc. Pileus only a few lines broad. Habit like that of *A. corticola*.

285. A. (Naucoria) *nuceus*, *Bolt.*; pileus submembraneous, globoso-campanulate, umbilicate, dotted; margin incurved, somewhat lobed; stem slender, fistulose, silky, white;

gills attenuated, adnate, ascending, somewhat lobed, cinnamon.—*Bolt. t. 70.*

On the ground, amongst fir-trees, *Bolton*. I have never seen this species. Pileus scarcely an inch across, pale chestnut.

286. A. (*Naucoria*) *melinoides*, *Fr.*; pileus slightly fleshy, convexo-plane, obtusely umbonate, smooth, moist; stem hollow, rather thick, pruinose above, white at the base; gills adnate, broad, triangular, toothed, honey-coloured. (Plate 9, fig. 3.)

On lawns. Very common. Pileus about an inch across, yellowish.

\*\* *Pileus smooth; spores brownish-ferruginous.*

287. A. (*Naucoria*) *vervacti*, *Fr.*; pileus fleshy, convexo-plane or umbonate, smooth, viscid, shining when dry; stem stuffed, then hollow, attenuated, smooth, stiff, dirty-white, rootless; gills adnate, with a decurrent tooth, crowded, then ventricose, pallid, then ferruginous-brown.

In meadows, gardens, etc. Bromley, *Mr. Sparkes*. Probably not uncommon. Pileus yellowish.

288. A. (*Naucoria*) *pediades*, *Fr.*; pileus slightly fleshy, convexo-plane, obtuse or depressed, dry, at length opaque; stem containing a distinct pith, somewhat flexuous, slightly silky, yellowish, somewhat bulbous at the base; gills adnexed, broad, somewhat distant, brownish, then dirty-cinnamon.

In pastures. Cranford, Middlesex, *Mr. J. Graham*. Probably not uncommon.

289. A. (*Naucoria*) *semiorbicularis*, *Bull.*; pileus slightly fleshy, hemispherical, expanded, even, smooth, somewhat viscid; stem slender, tough, nearly straight, pale ferruginous, shining, containing a distinct separable pith; gills adnate, very broad, crowded, pallid, then ferruginous. (Plate 9, fig. 4.)

On lawns and pastures. Summer and early autumn. Extremely common. Often confounded with *A. semiglobatus*.

290. *A. (Naucoria) inquilinus*, *Fr.*; pileus submembranaceous, convexo-plane, smooth, slightly striate, hygrophanous, somewhat fleshy in the centre; stem short, fistulose, tough, dark-brown, attenuated downwards; gills triangular, convex, adnato-decurrent, scarcely crowded, brownish-ferruginous.

On chips, in woods, gardens, etc. Royal Botanic Gardens, Regent's Park, etc. Pileus a few lines across, yellowish or tan-coloured.

\*\*\* *Pileus flocculose or squamulose.*

291. *A. (Naucoria) furfuraceus*, *P.*; pileus slightly fleshy, convexo-plane, obtuse and depressed, moist, hygrophanous, at first clothed with silky evanescent scales; stem fistulose, flocculose, rigid, pale; gills adnate, decurrent, rather distant, cinnamon.

On chips, etc. Extremely common. Pileus reddish-brown, often nearly white when dry.

292. *A. (Naucoria) erinaceus*, *Fr.*; pileus slightly fleshy, convex, somewhat umbilicate, clothed with scales consisting of fasciculate hairs; stem slender, fistulose, short, incurved, hairy; gills adnate, rather crowded, entire.—*Sow. t.* 417.

On dead sticks. Rare. Southwick, Northamptonshire, etc. Pileus half an inch across, bright brown, as well as the stem.

293. *A. (Naucoria) siparius*, *Fr.*; pileus slightly fleshy, obtuse, clothed with downy scales, as well as the stuffed stem, which is pruinose above; gills broad, adnate, somewhat distant, floccose at the edge.

On soil and caddis-cases at the edge of a pond. East Bergholt, *Dr. Badham*. Resembling the last, but not so bright in colour.

Subgenus 20. GALERA.—Stem externally subcartilaginous; pileus more or less campanulate; margin straight.

294. A. (*Galera*) *reticulatus*, *P.*; pileus slightly fleshy, campanulato-expanded, viscid, rough with a network of veins; margin striate; stem brittle, fibrillose, white; gills free, ventricose, crowded, of a yellow-ferruginous tint. (Plate 9, fig. 5.)

On dead wood. Rare. Northamptonshire. Pileus pale violet. Care must be taken to distinguish this from such species as *A. phlebophorus*. The affinities of *A. pilipes*, Sow., are altogether doubtful.

295. A. (*Galera*) *lateritius*, *Fr.*; pileus submembranaceous, acorn-shaped, then conical, even, hygrophanous; stem tall, brittle, straight, attenuated upwards, and frosted with white meal; gills linear, nearly free, very narrow, tawny-ferruginous.—*Fl. Dan. t.* 1846. *f.* 2.

In rich pastures. Rare. Fineshade, Northamptonshire. Pileus and stem more ferruginous than in the next.

296. A. (*Galera*) *tener*, *Schæff.*; pileus submembranaceous, conico-campanulate, obtuse, hygrophanous; stem straight, brittle, shining, nearly of the same colour; gills adnate, crowded, ascending, rather broad, cinnamon.—*Sow. t.* 33.

Rich pastures, dungy ground, etc. Extremely common. Pileus nearly white when dry, tawny when moist. There is another distinct species with a more conical pileus, which is minutely rivulose, with a sulcate margin, and smaller spores, which for the present I refrain from naming.

297. A. (*Galera*) *ovalis*, *Fr.*; pileus submembranaceous, ovali-campanulate, even, hygrophanous; stem straight, equal, slightly striate, nearly of the same colour; ring fugitive; gills nearly free, ventricose, very broad, ferruginous.—*Bull. t.* 552. *f.* 1.

On dung. Rare. A larger species than the last. Pileus dusky-ferruginous.

298. **A. (Galera) confertus**, *Bolt.*; pileus submembranaceous, acutely conico-campanulate, smooth, hygrophanous; stem slender, silky, shining, naked; base equal, deeply rooting; gills slightly adnexed, rather distant, white, then brownish-ochraceous.—*Bolt. t. 18.*

In stoves. Rare. I have not met with this species. Densely crowded.

299. **A. (Galera) sparteus**, *Fr.*; pileus membranaceous, campanulato-convex, then expanded, hygrophanous, dry, even, smooth; stem thin, flexible, smooth; gills adnate, crowded, plane, cinnamon.—*Bolt. t. 51. f. 1.*

Amongst moss, in meadows. Rare. Pileus about half an inch across, cinnamon, tan-coloured when dry.

300. **A. (Galera) embolus**, *Fr.*; pileus membranaceous, campanulate, obtuse, radiato-striate, hygrophanous; stem quite smooth, shining, thickened upwards; gills thick, very distant, adnate, triangular.

Amongst heath. On Moelfre-uchaf, Denbighshire. Pileus tawny when moist, ochraceous when dry. Tufted.

301. **A. (Galera) Hypnorum**, *Batsch*; pileus membranaceous, campanulate, with frequently a central papilla, smooth, striate, hygrophanous; stem thin, flexuous, of the same colour, pruinose above; gills adnate, rather distant, broad, at length plane, cinnamon-yellow.—*Sow. t. 282.*

Amongst moss. Extremely common. Yellowish in every part. Requires to be cautiously distinguished from small *A. melinoides*. Attend to the difference of the margin.

Subgenus 21. **CREPIDOTUS**.—Pileus excentric; spores not white.

302. **A. (Crepidotus) alveolus**, *Lasch*; pileus fleshy, soft,

lateral, obovate, and waved, opaque, contracted and tomentoso-villous behind; gills crowded, determinate, broad, clay-brown.

On old stumps. King's Cliffe. Pileus brownish-ochraceous. Nearly allied to the next, but not so soft and watery.

303. **A.** (*Crepidotus mollis*, *Schæff.*; pileus subgelatinous, flaccid, even, smooth, turning pale; stem obsolete; gills crowded, linear, dirty-white, then watery-cinnamon. (Plate 9, fig. 6.)—*Huss. i. t. 74.*

On old stumps. Common. Pileus  $1\frac{1}{2}$ –3 inches across, pale.

304. **A.** (*Crepidotus haustellaris*, *Fr.*; pileus slightly fleshy, reniform, even, slightly villous; stem lateral, attenuated upwards, villous, white; gills rounded, nearly free, brownish-cinnamon.—*Batsch, f. 121.*

On dead trunks. Rare. Not observed since the time of Withering.

305. **A.** (*Crepidotus Rubi*, *B.*; pileus fleshy, clothed with very minute crystalline meal; stem short, incurved, solid, strigose at the base; gills adnato-decurrent, greyish, then umber, slightly ventricose. (Plate 9, fig. 7.)

On dead bramble, etc. Rare. Pileus half an inch across, yellowish or livid-grey. Spores umber.

306. **A.** (*Crepidotus chimonophilus*, *B. and Br.*; white; pileus convex, rather thick, villous; stem very short or obsolete; gills distant, attenuated behind.

On small dead branches of *Pyrus torminalis*. Benefield, Northamptonshire. Spores pale yellow-brown. Pileus a quarter of an inch across. Margin inflexed.

307. **A.** (*Crepidotus variabilis*, *P.*; pileus submembranaceous, resupinate, then reflexed, clothed with white down; gills rather close, white, then rusty-red, at length pale-cinnamon. (Plate 10, fig. 1.)—*Huss. i. t. 50.*

On sticks, dead furze, etc. Extremely common. Easily known by its reddish gills, which resemble in colour those of *Hyporhodii*.

308. **A.** (*Crepidotus*) *depluens*, *Batsch*; pileus submembranaceous, resupinate, then reflexed, somewhat conchate, clothed with white down behind; gills broad, crowded, grey, then reddish.—*Batsch*, *f.* 122.

On the ground, in stoves, etc. Not common. Whitish when dry.

309. **A.** (*Crepidotus*) *byssisedus*, *P.*; pileus submembranaceous, resupinate, then reflexed, nearly plane, pruinose with greyish down; stem incurved; gills broad, dirty-white, inclining to cinereous.—*Pers. Ic. and Desc. t.* 14. *f.* 4.

On the ground. Rare. Spores irregular, as in many of smaller *Hyporhodii*.

310. **A.** (*Crepidotus*) *Pezizoides*, *Nees*; pileus sessile, thin, cup-shaped, then reflexed, mealy, subtomentose; gills meeting in the centre, rather distant, olive-brown, then tawny.

On rotten branches. Rare. Found only in Warwickshire, by Mr. Rufford.

Series 4. PRATELLE.—*Spores brownish-purple or brown.*

Subgenus 22. PSALLIOTA.—Veil fixed to the stem, forming a ring.

311. **A.** (*Pratella*) *campestris*, *L.*; pileus fleshy, convexo-plane, dry, flocculose or squamulose; stem stuffed, even, white; ring placed about the middle of the stem, somewhat torn; gills free, approximate, ventricose, subdeliquescent, flesh-coloured, then brown. (Plate 10, fig. 2.)—*Huss. i. t.* 90.

In rich pastures. Common in most parts of the world, and extremely variable. Some of the forms are as follows:—

*A. PRATENSIS*, *Vitt.*; distinguished by the small rufous scales of the pileus, and the flesh having a slight pink tinge. King's Cliffe. East Bergholt.

*A. VILLATICUS*, *Brond.*, acquires a large size, and is very scaly.

This has been found by Dr. Badham in Suffolk.

*A. SILVICOLA*, *Vitt.*, has a shining, smooth pileus, and an elongated bulbous stem, and is not uncommon in woods.

The Mushroom of our gardens is also a distinct form, remarkable for its brownish hue and fibrillose or squamulose pileus. Mr. Buchanan has sent a very distinct bed-Mushroom, which has the merit of being excellent in quality, and extremely prolific. It has a white, opaque, nearly smooth, depressed pileus. He also sent at the same time a variety with a tall stem and somewhat bulbous base, approaching *A. silvicola*, *Vitt.*

*A. VAPORARIUS*, *Otto*, has a broad, entire ring, while *A. vaporarius*, *Vitt.*, has a brown pilose coat, which covers the stem as well as the pileus, and leaves transverse fragments on the stem as it elongates. Finally, a very distinct variety is represented in our Plate 10, fig. 3, which is rufous, like *A. vaccinus*, and whose flesh turns of a bright red when bruised. In this the gills are at first perfectly white, as in *A. cretaceus*. All of these might be proposed as distinct species, with almost as much justice as the two or three which follow.

312. *A. (Psalliota) arvensis*, *Schæff.*; pileus fleshy, obtusely conico-campanulate, then expanded, at first floccose, then smooth, even, or rivulose; stem hollow, with a floccose pith; ring broad, pendulous, double, the outer split in rays; gills free, wider in front, at first dirty-white, then brown, tinged with pink. (Plate 10, fig. 4.)—*Huss. i. t.* 76, 77.

In meadows, forming large rings, and attaining an enor-

mous size. A coarse, but wholesome species, often turning yellow when bruised. There is also a scaly tawny form.

313. **A.** (*Psalliota*) *cretaceus*, *Fr.*; pileus fleshy, campanulate, then convexo-plane, even, nearly smooth or rivulose; stem hollow, equally attenuated, even, white; ring simple, reflexed, and again ascending; gills remote, broader in front, for a long time white. (Plate 10, fig. 5.)

In meadows and stoves. Not common. Generally pure white. The stem is sunk into the substance of the pileus so as to make the gills remote. At first sight looks much like a *Lepiota*, as, for example, *A. naucinus*.

314. **A.** (*Psalliota*) *silvaticus*, *Schæff.*; pileus fleshy, thin, campanulate, then expanded, gibbous, fibrillose or squamose; stem hollow, at first stuffed with delicate threads, unequal, dirty-white; gills free, crowded, thin, dry, reddish, then brown.—*Schæff. t.* 242.

In woods. Not uncommon. Pileus brownish. Smell strong.

315. **A.** (*Psalliota*) *echinatus*, *Roth*; pileus slightly fleshy, campanulate, then expanded, obtuse, at first densely pulverulent, then scaly; stem fistulose, equal, floccoso-pulverulent below the ring; gills free, crowded, blood-red.

On peat-beds, in gardens. Rare. Milton, Northamptonshire, etc. Pileus about  $1\frac{1}{2}$  inch across, of a dingy smoky purple, as is also the stem. Spores sometimes colourless. A most curious species.

316. **A.** (*Psalliota*) *versicolor*, *With.*; pileus fleshy, convexo-plane, scurfy, scales of the disc crowded; stem spongy, bulbous, dirty-white, inclining to brown; ring persistent; gills decurrent, pallid, then reddish-brown.

Edgbaston. Pileus greenish-brown. This has not been recognized since the time of Withering.

317. *A. (Psalliota) æruginosus*, *Curt.*; pileus fleshy, convexo-plane, somewhat umbonate, clothed with green evanescent mucus; stem hollow, equal, scaly and fibrillose below the ring, tinged with blue; gills adnate, soft, brown, tinged with purple.—*Fl. Lond. t.* 309; *Huss. i. t.* 35.

In meadows, etc. Very common. Pileus 3 inches across, at first scaly with fragments of the veil, dingy-yellow when the green slime has vanished.

318. *A. (Psalliota) albo-cyaneus*, *Desm.*; pileus fleshy, thin, umbonate, even, viscid, livid, then whitish; stem slender, hollow, flexuous, even, whitish; ring incomplete; gills attenuato-affixed, whitish flesh-colour, then brownish-purple.—*Pers. Myc. Eur. t.* 29. *f.* 2, 3.

In meadows, and on dung. Not uncommon. Sometimes with *A. æruginosus*, of which it is possibly only a variety.

319. *A. (Psalliota) melaspermus*, *Bull.*; pileus fleshy, convexo-plane, obtuse, soft, even, smooth, slightly viscid; stem hollow, equal, smooth, white, as well as the membranaceous ring; gills slightly adnexed, ventricose, crowded, pallid, then violet-black.—*Bull. t.* 540. *f.* 1.

In meadows and woods. Rare. Coed Coch. Resembling *A. præcox*, but with different-coloured spores and gills.

320. *A. (Psalliota) squamosus*, *Fr.*; pileus fleshy, thin, convexo-plane, somewhat viscid, sprinkled with superficial concentric scales; stem long, slender, subfistulose, villososquamosa below the distant ring; gills adnate, crowded, at length black, edge whitish. (Plate 10, fig. 6.)

In woods. Not common. Varying in the nature and number of the scales on the stem and pileus. A beautiful species when well-grown.

321. *A. (Psalliota) stercorarius*, *Fr.*; pileus slightly fleshy, hemispherical, then expanded, smooth, even, somewhat viscid,

as well as the elongated stem, which is at first flocculose, and contains a distinct pith; gills adnate, broad, white, then umber or olive-black.

On dung. Northamptonshire. Probably not uncommon. Pileus yellowish. Often confounded with the following, which has a fistulose stem.

322. **A.** (*Psalliota*) *semiglobatus*, *Batsch*; pileus slightly fleshy, hemispherical, even, glutinous, and yellowish, as well as the fistulose, slender, smooth, straight stem; gills broad, adnate, plane, clouded with black.—*Grev. t.* 344; *Huss. i. t.* 39.

On dung. Extremely common. Said to be poisonous.

Subgenus 23. *HYPHOLOMA*.—Veil woven into a fugacious web, which adheres to the margin of the pileus.

323. **A.** (*Hypholoma*) *sublateritius*, *Fr.*; pileus fleshy, convexo-plane, obtuse, discoid, dry, at length smooth; flesh compact, dirty-white; stem stuffed, fibrillose, attenuated downwards, ferruginous; gills adnate, crowded, white, then dingy-olive.—*Huss. i. t.* 60.

On old stumps, in woods. Common. Pileus 3 inches across, brick-red, variegated with yellow.

324. **A.** (*Hypholoma*) *fascicularis*, *Huds.*; pileus fleshy, thin, subumbonate, smooth; stem hollow, thin, flexuous, fibrillose, yellow, as well as the flesh of the pileus; gills adnate, very crowded, linear, subdeliquescent, sulphur-coloured, then greenish. (Plate 11, fig. 1.)—*Huss. ii. t.* 15.

On old stumps, fallen trees, etc. Extremely common. Perhaps confounded occasionally with *A. conissans*. Taste bitter.

325. **A.** (*Hypholoma*) *dispersus*, *Fr.*; pileus slightly fleshy, campanulate, expanded, obtuse, even, silky near the margin from the veil; stem thin, tough, subfistulose, silky, brown at the

base; gills thin, adnate, somewhat ventricose, crowded, pallid straw-colour, then clouded.

On stumps and on the ground, in pine-woods. Mossburnford, *Jerdon*. Coed Coch. Either scattered or fasciculate. Pileus  $1\frac{1}{2}$  inch across, tawny.

326. A. (*Hypholoma*) *lacrymabundus*, *Fr.*; pileus fleshy, campanulato-convex, obtuse, spotted with innate hairy scales; flesh white, as well as the hollow, fibrilloso-squamose stem, which is slightly thickened at the base; gills adnate, seceding, white; then brown-purple.

On trunks of trees, and on the ground. Pileus not hygrophanous, as in the next.

327. A. (*Hypholoma*) *velutinus*, *P.*; pileus somewhat fleshy, ovate, then expanded, gibbous, fibrillose, hygrophanous, at length nearly smooth, fleshy and hollow, equal, fibrillose, striate; stem yellow-brown; gills truncato-adnexed, ventricose, scarcely crowded, brown, then umber, studded with drops of moisture. (Plate 11, fig. 2.)

On stumps of trees. Extremely common. Very variable in size, but generally larger than the foregoing.

328. A. (*Hypholoma*) *appendiculatus*, *Bull.*; pileus carnosomembranaceous, ovate, expanded, smooth, hygrophanous, when dry wrinkled and sparkling with atoms; stem fistulose, equal, smooth, white, pruinose above; gills somewhat adnate, crowded, dirty-white, then rosy-brown. (Plate 11, fig. 3, 4.)

On dead stumps. Extremely common. Veil attached in patches to the margin.

329. A. (*Hypholoma*) *Candollianus*, *Fr.*; pileus somewhat fleshy, campanulate-then convex, expanded, obtuse, smooth, hygrophanous; stem hollow, brittle, subfibrillose, white, striate above; gills rounded, adnexed, crowded, violet, then brownish-cinnamon.—*Fl. Dan. t. 774.*

On dead stumps. Rare. King's Cliffe. I have not seen it elsewhere.

Subgenus 24. *PSILOCYBE*.—Veil, if present, not forming a ring.  
Margin of pileus at first incurved.

330. *A. (Psilocybe) spadiceus*, *Schæff.*; rigid; pileus fleshy, convexo-plane, obtuse, even, moist, hygrophanous; stem hollow, tough, pallid, even above; gills rounded behind, adnexed, dry, crowded, white, then rosy-brown.

On dead stumps, on the ground, etc., in woods. Very common. A variable species.

331. *A. (Psilocybe) cernuus*, *Müll.*; pileus slightly fleshy, campanulato-convex, expanded, smooth, hygrophanous, minutely wrinkled when dry; stem flexuous, smooth, white, pruinose above, fistulose; gills adnate, slightly ventricose, scarcely crowded, cinereous, white at first, then brownish-black.—*Fl. Dan. t.* 1008.

On chips, decayed wood, etc. Apethorpe. Pileus pallid. This has no veil.

332. *A. (Psilocybe) Fœnisecii*, *P.*; pileus slightly fleshy, campanulate, expanded, obtuse, pallid when dry, even, smooth, as well as the fistulose, rootless, pallid-rufous stem; gills adnate, ventricose, widely emarginate, scarcely crowded, brownish-umber. (Plate 11, fig. 5.)—*Huss. i. t.* 39.

Amongst grass, in fields and gardens. Extremely common. Pileus when moist dark-brown. Attention must be paid to the colour of the spores, or this species will be sought for amongst the *Panæoli*.

333. *A. (Psilocybe) coprophilus*, *Bull.*; pileus slightly fleshy, hemispherical, expanded, then umbonate, at length smooth, as well as the somewhat fistulose stem, which is

attenuated above and pruinose; gills broad, arcuato-subdecurrent, livid-brown.—*Bull. t.* 566. *f.* 3.

On dung. Rare. Northamptonshire. Pileus at first white and downy, clothed with little white superficial scales, brown, at length smooth and umber.

334. A. (*Psilocybe*) *bullaceus*, *Bull.*; pileus slightly fleshy, hemispherical, expanded, smooth, at length umbonate, striate halfway up; stem short, fistulose, equal, fibrillose; gills adnate, triangular, plane, crowded, ferruginous-brown.—*Bull. t.* 566. *f.* 2.

On horse-dung. Not uncommon. Pileus three-quarters of an inch across, bay when moist, tan-coloured when dry. This is probably *A. stercorarius*, Eng. Fl.

335. A. (*Psilocybe*) *physaloides*, *Bull.*; pileus slightly fleshy, campanulate, expanded, even, rather viscid; stem fistulose, flexible, closely fibrillose, bright brown at the base; gills crowded, decurrent, subferruginous.—*Bull. t.* 566. *f.* 1.

On the walls of the sewage-filtering apparatus, Croydon.

336. A. (*Psilocybe*) *areolatus*, *Klotzsch*; pileus subcarnose, convex, clothed with minute fibrillæ; cuticle cracking into nearly square patches; stem fistulose, fibrillose, dirty-white; gills adnate, umber, at length black; edge white.

In gardens. Glasgow, *Klotzsch*. This is nearly allied to *A. tegularis*, Schum. Pileus ochraceous or brown.

337. A. (*Psilocybe*) *semilanceolatus*, *Fr.*; pileus submembranaceous, acutely conical, almost cuspidate, moist, viscid, slightly striate; stem tough, flexuous, pallid, smooth, containing a pith; gills adnexed, ascending, purple-black.—*Sow. t.* 240. *f.* 1-3.

In rich pastures. Common. This is *A. callosus*, Eng. Fl., a species now divided into two.

Subgenus 25. *PSATHYRA*.—Veil none, or not forming a ring.  
Pileus conical or campanulate; margin at first straight.

338. **A.** (*Psathyra*) *conopilus*, *P.*; pileus submembranaceous, campanulate, umbonate, slightly wrinkled, turning pale; stem tall, attenuated upwards, smooth, shining with a silvery lustre; gills slightly adnexed, crowded, brownish-purple.—*Jungh. in Linn. v. t. 6. f. 11.*

In gardens. Rare. King's Cliffe. Pileus at first dirty-white, 2 inches across; stem 4–6 inches high.

339. **A.** (*Psathyra*) *corrugis*, *P.*; pileus submembranaceous, campanulate, umbonate, slightly wrinkled, smooth, turning pale; stem elongated, equal, smooth, white; gills sinuated, adnate, ventricose, violet-black.—*Bull. t. 561. f. 1.*

In pastures. Coed Coch. Pileus tinged with pink.

340. **A.** (*Psathyra*) *bifrons*, *B.*; pileus submembranaceous, campanulate, obtuse, ochraceous-brown, tinged with red, turning pale-tan; stem straight, naked; gills pinkish-cinereous, adnate; margin white.—*Engl. Fl. l. c. p. 114.*

In ditches. Rare. Northamptonshire. Pileus  $\frac{3}{4}$  of an inch across, clothed, when young, with a delicate, evanescent veil.

341. **A.** (*Psathyra*) *spadiceo-griseus*, *Schæff.*; pileus submembranaceous, conico-campanulate, then expanded, slightly umbonate, smooth, striate, hygrophanous; stem firm, attenuated upwards, shining, white, striate above; gills adnexed, rather crowded, brown.—*Schæff. t. 237.*

On chips, etc. Beeston, Notts. Pileus bright brown; gills pale umber at first; stem umber within.

342. **A.** (*Psathyra*) *fibrillosus*, *P.*; pileus submembranaceous, campanulato-convex, then expanded, slightly striate, at first fibrillose; stem elongated, very brittle, white, fibril-

loso-squamose; gills adnate, plane, very broad behind, purple-black.

On the ground, in woods. Rare. Pileus livid, white when dry. The gills in my specimens are 3 lines broad, and nearly equal throughout, so that they must be considered as belonging to a distinct variety.

343. **A.** (*Psathyra*) *gossypinus*, *Fr.*; pileus submembranaceous, campanulato-expanded, tomentose, even, smooth; margin striate; stem tomentose, dirty-white; gills adnexed, ventricose, white, then brown-black.—*Bolt. t. 71. f. 1.*

In woods, on the ground. Rare. Pileus of a pallid ochre. I believe *A. xylophilus*, Sow., which Fries refers to *A. nolintangere*, is merely a state of *A. furfuraceus*.

Series 5. **COPRINARIUS.**—*Spores black; gills never becoming purple or brown.*

Subgenus 26. **PANÆOLUS.**—Veil, when present, interwoven. Pileus rather fleshy, without striæ; margin at first extending beyond the gills, which are clouded.

\* *Pileus viscid when moist, shining when dry.*

344. **A.** (*Panæolus*) *separatus*, *L.*; pileus somewhat fleshy, campanulate, obtuse, even, viscid; stem straight, shining, white, thickened downwards, ring distant; gills fixed, cinereous-black. (Plate 11, fig. 7.)

On dung. Extremely common. Pileus varying a good deal in size, semiovate, pale tan-coloured; stem soiled with the black spores.

345. **A.** (*Panæolus*) *fimiputris*, *Bull.*; pileus submembranaceous, conico-expanded, somewhat gibbous, even, viscid; stem slender, equal, smooth, pallid; gills livid-black. (Plate 11, fig. 6.)

On dung, and in pastures. Very common. Pileus lead-coloured, generally beaded with the veil.

346. *A.* (*Panæolus*) *Phaiænarum*, *Fr.*; pileus somewhat fleshy, campanulato-convex, obtuse, even, smooth, viscid; veil appendiculate, fugacious; stem equal, rather firm, nearly naked, at length pale rufous; gills adnexed, broad, cinereous-black.—*Bull. t.* 58.

On dung. Apethorpe, Northamptonshire. Probably not uncommon. Pileus pale tan-coloured.

347. *A.* (*Panæolus*) *retirugis*, *Batsch*; pileus somewhat fleshy, at first subglobose, at length subumbonate, reticulated with raised ribs, and sparkling; veil torn, appendiculate; stem equal, pruinose, of a pinkish purple; gills ascending, fixed, cinereous-black.—*Batsch, f.* 91.

On dung. Coed Coch. Distinguished from *A. corrugis* by its black spores.

348. *A.* (*Panæolus*) *campanulatus*, *L.*; pileus somewhat fleshy, campanulate, dry, even, smooth, somewhat shining; stem equal, straight, rufous, striate above; gills fixed, ascending, variegated with grey and black.—*Bull. t.* 561. *f.* 2 *L.*

On rich soil, dung, etc. Common. Pileus brownish, tinged with rufous.

349. *A.* (*Panæolus*) *papilionaceus*, *Bull.*; pileus somewhat fleshy, hemispherical, smooth, when dry rimoso-squamose; stem equal, even, dirty-white, pruinose above; gills broadly adnate, very wide, at length plane, blackish.—*Bull. t.* 561. *f.* 2 *N, M.*

On rich soil, dung, etc. Common. Pileus whitish-grey.

350. *A.* (*Panæolus*) *fimicola*, *Fr.*; pileus slightly fleshy, campanulato-convex, obtuse, smooth, opaque, marked near the margin with a narrow zone; stem brittle, elongated, equal, pallid, pruinose above; gills broad, adnate, variegated with grey and dingy-brown.—*Boll. t.* 66. *f.* 1.

On dung, rich pastures, etc. Not gathered since Bolton's time.

Subgenus 27. *PSATHYRELLA*.—Veil not interwoven. Pileus membranaceous; margin not reaching beyond the gills.

351. *A. (Psathyrella) gracilis*, *Fr.*; pileus submembranaceous, conical, slightly striate when moist, hygrophanous; stem slender, straight, naked, pallid; gills broadly adnate, rather distant, cinereous-black, edged with pale-rose.

On hedge-borders. Very common. Pileus brownish, at length often tinged with pink.

352. *A. (Psathyrella) hiascens*, *Fr.*; pileus membranaceous, campanulate, deeply sulcate; disc even; stem straight, rigid, brittle, smooth, white; gills adnate, linear, rather distant, acute in front, pallid, then black.—*Bull. t.* 552. *f.* 2 *F.*

Under hedges. Woodnewton. Pileus 1 inch high, 1½ inch across, sulcate up to the disc, pale dirty-ochraceous.

353. *A. (Psathyrella) aratus*, *n. s.*; pileus membranaceous, campanulato-conic, rather acute, deeply sulcate; stem tall, thickened at the base, white, smooth, fistulose; gills lanceolate, quite free, purplish-black.

Under hedges. Woodnewton. Pileus 1 inch high,  $\frac{4}{5}$  across, bright brown; flesh of the disc of the same colour; stem 5 inches high. Allied to *A. hydrophorus*, *Bull.*, but clearly distinct.

354. *A. (Psathyrella) atomatus*, *Fr.*; pileus submembranaceous, campanulate, obtuse, slightly striate, hygrophanous, when dry rugulose, sparkling; stem brittle, white, mealy above; gills broad, adnate, cinereous-black.

About hedge-borders, etc. Very common. Pileus at first brownish, then tinged with pink.

355. *A. (Psathyrella) disseminatus*, *P.*; pileus membra-

naceous, ovato-campanulate, furfuraceous, then naked, sulcato-plicate, changing colour; stem somewhat flexuous, brittle, furfuraceous, then smooth; gills adnate, broadly linear, dirty-white, then black.—*Sow. t.* 166.

About the trunks of trees, and on the ground. Forming large tufts. Extremely common. Pileus a few lines only across. Approaching very near to *Coprinus*. *A. membranaceus*, Bolt., is too doubtful as to its affinities to admit of its being registered.

## 2. COPRINUS, *Fr.*

Gills membranaceous, deliquescent. Spores black.

### 1. *Pileus not plicato-sulcate.*

1. *C. comatus*, *Fr.*; pileus rather fleshy, cylindrical, obtuse, then expanded, soon torn up into broad, scattered scales; stem hollow, fibrillose, stuffed with a cottony web; bulb solid, rooting; ring moveable; gills free, linear, white, then tinged with red.—*Grev. t.* 119.

Sides of roads, pastures, etc. Common. Extremely variable in size. Esculent when young. I believe that Bolt. t. 142 is a mere variety. I have found *C. comatus* at Abergele equally dwarf, and with a precisely similar volvate ring.

2. *C. sterquilinus*, *Fr.*; pileus membranaceous, conical, expanded, sulcate, at first villous; disc rather fleshy, rough with scales; stem attenuated, fibrillose, solid, rootless, having a ring; gills free, ventricose, purplish.—*Mich. t.* 83. *f.* 3.

On dung. Rare. King's Cliffe. About  $1\frac{1}{2}$  inch across.

3. *C. atramentarius*, *Fr.*; pileus rather fleshy, ovate, at first irregular, spotted above with innate scales; stem firm, hollow, zoned within; ring abrupt, fugacious; gills free, ventricose, white, then purplish-black. (Plate 12, fig. 1.)

About old stumps and on the naked soil in gardens. Very common. Often densely cæspitose. Pileus of a dull, dingy white or ochre, slightly rugose, sometimes sparkling.

4. *C. luridus*, *Fr.*; pileus submembranaceous, ovato-conical, irregular, smooth, viscid, even; stem firm, solid, equal, brown; gills-free, ventricose, blue-black.—*Bolt. t. 25.*

On the ground. Not found since the time of Bolton. Perhaps a mere state of the last.

5. *C. fuscescens*, *Fr.*; pileus submembranaceous, ovato-expanded, polished; disc slightly fleshy, even or cracked, scaly; stem hollow, brittle, curved, slightly fibrillose, scarcely annulate; gills fixed; umber-black.

On dead stumps. Rare. Kilmory, Argyllshire, *Lady Orde.*

6. *C. picaceus*, *Fr.*; pileus membranaceous, ovato-campulate, striate, variegated with broad, white, superficial scales; stem hollow down to the rootless bulb, brittle, smooth; gills free, ventricose, cinereous-black.—*Sow. t. 170.*

On roadsides. Rare. Smell often extremely disagreeable. Pileus 2 inches or more across, pied.

7. *C. aphthosus*, *Fr.*; pileus membranaceous, ovato-campulate, free from striæ, sprinkled with superficial, floccose scales, then naked; stem hollow, equal, twisted, fibrillose; gills adnate, linear, white, then black.—*Bolt. t. 26.*

In hollow trees, cellars, etc. Not common.

8. *C. extintorius*, *Fr.*; pileus submembranaceous, clavato-campulate, straight, margin striate, at first sprinkled with floccose scales; stem hollow, smooth, attenuated from the rooting base; gills reaching the stem, lanceolate, white, then brownish-black.—*Bolt. t. 24.*

On the ground. Bolton's plant has not exactly the same habit as Bulliard's, t. 437. f. 1, but Fries considers it identical, and it is perhaps a cæspitose variety.

9. *C. fimetarius*, *Fr.*; pileus submembranaceous, clavato-conic, soon torn and revolute, at first rough with white floccose scales, then naked, longitudinally rimoso-sulcate, even at the apex; stem squamulose, thickened at the base, solid; gills free, black, lanceolate, then linear and flexuous.

On dungheaps. Extremely common. A variable species. *Sow. t.* 262 represents one of the varieties. Sometimes there is a root as long as the stem. I have this state and a beautiful drawing from Mr. Browne, of Hitchin.

10. *C. tomentosus*, *Fr.*; pileus submembranaceous, cylindrical, then conic flocculoso-tomentose, at length longitudinally rimose; stem hollow, rather short, equal, velvety; gills free, linear, brownish-black.—*Bolt. t.* 156.

On dung and in rich pastures. Not uncommon. The coating sometimes peels off in broad patches.

11. *C. niveus*, *Fr.*; pileus submembranaceous, oval, then campanulate, floccoso-squamulose, and densely furfuraceous; stem fistulose, equal, villous, white; gills somewhat adnate, narrow, black.—*Sow. t.* 262.

On horse-dung, etc. Very common. Known at once by the white, mealy coat. Sometimes appearing with the first summer rains.

12. *C. micaceus*, *Fr.*; pileus submembranaceous, oval, then campanulate, rather irregular, striate, sparkling, at length naked, rimoso-sulcate; stem hollow, finely silky, dirty-white; gills adnexed, lanceolate, dirty-white, then partially shaded with brown.—*Sow. t.* 261.

About old stumps. Extremely common. Remarkable for the sparkling particles with which it is sprinkled. Pileus tawny, often densely caespitose.

13. *C. radians*, *Fr.*; pileus membranaceous, ovato-campulate, sparkling, disc granuloso-squamose, margin striate;

stem equal, naked, short, springing from radiating flocci; gills reaching the stem, nearly linear, white, then violet-black.—*Sow. t.* 145. *Desm. Ann. d. Sc. Nat.* xiii. *t.* 10. *f.* 1.

On plaster-walls. Sometimes very abundant. When young it looks like a little *Lycoperdon*.

14. *C. deliquescens*, *Fr.*; pileus submembranaceous, ovato-campanulate, then expanded, rather irregular, broadly striate, smooth, top studded with innate papillæ; stem hollow, smooth, veiled; gills at length remote, linear, dingy-black.—*Bull. t.* 558. *f.* 1.

On old stumps. Not common. Sometimes confounded with *C. atramentarius*.

2. *Pileus gaping in the direction of the trama, hence plicato-sulcate.*

15. *C. Hendersonii*, *Fr.*; pileus minute, at first cylindrical, then ovali-campanulate, at length plane, smooth, striate half-way up; stem filiform, at length smooth, with a small, erect, entire ring; gills narrow, black. (Plate 24, fig. 8.)

On hotbeds. Very rare. Milton, Norths. Looks like a small, annulate *A. disseminatus*. Pileus minutely granulated under a lens.

16. *C. macrocephalus*, *B.*; pileus at first cylindrical, then cylindrico-campanulate, sprinkled with pointed scales; stem dirty-white, fistulose, clothed with short, cottony down and loose fibres, strigose at the base; gills linear, perfectly free.

On putrid dung. Cotterstock, Norths. Pileus rather more than  $\frac{1}{2}$  an inch across; scales adpressed or patent; fibrils of stem deflexed.

17. *C. lagopus*, *Fr.*; pileus very thin, cylindrical, then campanulate, clothed with white flocci, at length split, radiato-

sulcate, and revolute; stem very brittle, white, woolly; gills free, linear, at length remote, distant.

On dung. Not uncommon. Remarkable for the dense, cottony coat of the stem.

18. *C. nychthemerus*, *Fr.*; pileus very thin, soon rimose, expanded, flocculoso-furfuraceous, then naked, furcato-striate; stem equal, flaccid, smooth, dirty-white; gills free, narrow, at length black, at first crowded, then distant, remote.—*Bull. t.* 542. *f. D. I.*

On dung. King's Cliffe. Pileus grey, a few lines across.

19. *C. radiatus*, *Fr.*; very delicate; pileus clavato-campulanate, tomentose, soon split, flattened, naked, plicato-radiate; stem filiform; gills free, distant, few in number.—*Bull.* 452. *L. E.-II.*

On dung, in meadows. Very common. Minute.

20. *C. domesticus*, *Fr.*; pileus thin, ovato-campulanate, obtuse, split, undulato-sulcate, furfuraceo-squamulose; stem attenuated, silky, white; gills fixed, crowded, linear, white, with a reddish tint, then brown-black.—*Huss.*

On damp carpets, etc. Not uncommon.

21. *C. ephemerus*, *Fr.*; pileus very delicate, ovali-clavate, then campanulate, split, radiato-sulcate, somewhat furfuraceous; disc raised, even; stem slender, equal, pellucid, smooth; gills reaching the stem, distant, dirty-white, then brown and black.—*Bull. t.* 128.

On dunghills. Common.

22. *C. plicatilis*, *Fr.*; pileus very delicate, ovali-cylindrical, soon expanded, split, sulcato-plicate, nearly smooth; disc broad, at length depressed, even; stem equal, smooth, white; gills adhering to a distinct collar, greyish-black.—*Curt. Lond. t.* 200.

In pastures. Very common. Spores broadly elliptic,  $\frac{1}{1000}$  inch long.

23. *C. Spragueii*, *B. and C.*; very delicate; pileus campanulate, then conical, tomentose, plicate; stem fistulose, pale-cinnamon; gills few, narrow.—*Ann. of Nat. Hist. Oct.* 1859.

In gardens. King's Cliffe, July 2, 1859. Spores narrow, subcymbiform,  $\frac{1}{2500}$  inch long. I received this originally from New England. The difference between it and the last as regards the spores is very striking.

24. *C. hemerobius*, *Fr.*; pileus very delicate, ovate, nearly even, expanded, campanulate, split, smooth, at length plicato-sulcate; top rather prominent; stem elongated, attenuated, smooth, pallid; gills linear, pallid, then black, adnexed to an obscure collar.—*Bolt. t.* 31.

On roadsides. Rare.

### 3. BOLBITIUS, *Fr.*

Gills becoming moist; trama obsolete; spores coloured.

1. *B. Boltonii*, *Fr.*; pileus slightly fleshy, viscid, membranaceous at the margin, at length sulcate; disc darker, somewhat depressed; stem attenuated, yellowish; ring fugacious, at first flocculose; gills somewhat adnate, livid-yellow, then brown.—*Bolt. t.* 119.

On dung. Pileus yellow, turning pale. Spores brownish. I am not acquainted with this species.

2. *B. fragilis*, *Fr.*; pileus submembranaceous, viscid, pellucid; margin striate; disc subumbonate; stem attenuated, naked, smooth, yellow; gills attenuato-adnexed, yellow, then pale-cinnamon.—*Sow. t.* 96.

On dung. Common. Pileus yellow, then whitish.

3. *B. titubans*, *Fr.*; pileus membranaceous, flattened out, pellucid, striate halfway up; stem slender, straight, shining, yellow; gills slightly adnexed, pallid, salmon-coloured.—*Sow. t.* 128.

Amongst grass. Common. Pileus yellow, but soon presenting the salmon-tint of the gills.

4. *B. tener*, *B.*; very delicate; pileus white, moist, conical, elongated; stem white, bulbous at the base; gills attenuated behind, nearly free, salmon-coloured. (Plate 12, fig. 2.)

Amongst short grass on a lawn. Apethorpe. At first looking like a dry specimen of *A. tener*.

#### 4. CORTINARIUS, *Fr.*

Gills membranaceous, persistent; trama floccose. Veil consisting of arachnoid threads. Spores rusty-ochre.\*

Subgenus 1. PHLEGMACIUM.—Pellicle of pileus viscid when moist.

Veil, and consequently the stem from which it springs, dry.

1. *C. (Phlegmacium) caperatus*, *Fr.*; pileus fleshy, ovate, then expanded, obtuse, moist, incrustated with superficial white flocci; stem stout, smooth, squamulose at the top from the reflected, membranaceous ring; gills adfixed, separating, serrate, crowded, clay-coloured.—*Bot. of East. Borders, with a fig.*

In woods. Very rare. Berwickshire. Lancashire, *Rev. H. H. Higgins*. A large and noble species, of a beautiful yellow.

2. *C. (Phlegmacium) varius*, *Fr.*; pileus compact, hemispherical, flattened, even, viscid; margin smooth; flesh white; stem short, solid, closely flocculose, dirty-white; gills crowded, emarginate, quite entire, purplish, then pallid-cinnamon.—*Schæff. t. 42.*

In woods. Not common. King's Cliffe.

\* The colours of *Cortinari* are not only very fugitive, but they change greatly according to the condition of the atmosphere. Those, therefore, which are mentioned, except something is said to the contrary, belong only to the young plant before it has been exposed to weather. The colour of the spores in most of the species is that of peroxide of iron; in a very few exceptional cases it is of a bright tawny.

3. *C. (Phlegmacium) cyanopus*, *Fr.*; pileus fleshy, hemispherical, flattened, even, viscid; margin thin, smooth, of the same colour; flesh dirty-white; stem solid, violet, then white, naked above the thin veil; bulb depressed, oblique; gills adnate, emarginate, broad, rather crowded, violet, turning pallid.—*Sow. t. 223.*

In woods. Pileus livid-brown, then tan.

4. *C. (Phlegmaecium) anfractus*, *Fr.*; pileus fleshy, unequal, deeply plicate and undulated, viscid, shining when dry; stem stuffed, unequal, closely fibrillose, violet above and veiled; gills arcuate, affixed, crisped, rather distant, dingy-olive, then cinnamon.

In woods. Rare. King's Cliffe. Pileus several inches across, deep-bay in my specimens, which I have named after a drawing sent me by Fries. The gills, however, are rather emarginate than arcuato-affixed, and the whole plant, when young, is covered with a white volva. Stem very thick and bulbous at the base. In outward form the two are identical.

5. *C. (Phlegmacium) multiformis*, *Fr.*; pileus fleshy, convex, expanded, equal, smooth, viscid; flesh and fugacious veil white; stem solid, attenuated, closely fibrillose, white, changing to yellow; bulb somewhat margined; gills emarginate, crowded, serrated, dirty-white, then clay-coloured, inclining to cinnamon.—*Sow. t. 102.*

In woods. Rare. Pileus yellowish. I have seen the bulb so margined as to give the impression of a volva like that of *Ag. pantherinus*.

6. *C. (Phlegmaecium) glaucopus*, *Fr.*; pileus compact, expanded, subrepand, viscid, then floccoso-squamoso or fibrillose; flesh at length yellowish; stem stout, solid, striate, bluish, then yellowish, margined below; gills emarginate, broad, blue, then clay-coloured, inclining to cinnamon.—*Huss.*

In pinewoods. Rare. Pileus remarkable for a brown, raised zone near the margin, at length turning pale.

7. *C. (Phlegmacium) callochrous*, *Fr.*; pileus fleshy, convex, flattened, smooth, viscid, unchangeable; flesh compact, white; stem solid, equal, fibrillose, white, changing to yellow; bulb distinct, margined; gills emarginate, crowded, serrate, blue, changing to purple. (Plate 12, fig. 3.)

In woods. Not uncommon. Pileus tawny.

8. *C. (Phlegmacium) cærulescens*, *Fr.*; pileus fleshy, convex, expanded, even, viscid; flesh soft, blue, turning white as well as the solid, attenuated, naked stem; bulb margined; gills adnexed, crowded, quite entire, at first of a pure dark blue.

In woods. King's Cliffe. Bristol, *Dr. Stephens*. Very beautiful, pileus at first blue, spotted in my specimens from the presence of minute fibrils. Stem not always marginate, rough above with the threads of the veil.

9. *C. (Phlegmacium) purpurascens*, *Fr.*; pileus compact, dilated, somewhat waved, virgate, viscid; flesh bluish; stem solid, blunt, fibrillose; bulb margined, evanescent; gills crowded, broadly emarginate, blue, then clay-coloured, inclining to cinnamon-purple when bruised.

Woods. Common. Pileus about 3 inches across, not turning pale, bright brown, at length tawny. This species has sometimes, but not constantly, a marginal zone.

10. *C. (Phlegmacium) turbinatus*, *Fr.*; pileus fleshy, plane, then depressed, viscid, self-coloured, smooth, turning pale; flesh soft, white; stem stuffed, nearly equal, shining, dirty-white, marginato-bulbous; gills attenuato-adnate, crowded, quite entire, reddish-grey, then ferruginous.

In woods. King's Cliffe. My specimens have the margin of the bulb so strongly developed as to appear volvate, like *Ag. pantherinus*. Pileus yellow when dry, variable in width.

11. *C. (Phlegmacium) scaurus*, *Fr.*; pileus fleshy, equal, smooth, virgate or spotted, viscid, turning pale; margin thin, at length slightly striate; stem solid, marginato-bulbous, attenuated, striate, turning pale; gills attenuato-adnate, thin, crowded, purplish, then olive.

In woods. King's Cliffe. Pileus 3-4 inches across, dingy-tawny. Stem purplish in my specimens, with a red tinge on the edge of the bulb.

12. *C. (Phlegmacium) prasinus*, *Fr.*; pileus compact, equal, viscid, variegated with scale-like spots; stem solid, short, firm, marginato-bulbous, greenish, as well as the veil; gills rounded, rather distant, yellow-olive.—*Schaff. t.* 218.

In beech-woods. King's Cliffe. Pileus 3 inches across, greenish.

Subgenus 2. *MYXACIUM*.—Universal veil, and consequently the stem, viscid and polished when dry.

13. *C. (Myxacium) collinitus*, *Fr.*; pileus fleshy, convex, subplicate, flattened, obtuse, even, glutinous, shining; stem firm, cylindrical, transversely scaly from the splitting of the floccose glutinous veil; gills adnate, clay-coloured and blue, then cinnamon.—*Sow. t.* 9.

In woods. Common. Pileus bright tawny, 3-4 inches across. Sometimes the veil of the stem does not crack.

14. *C. (Myxacium) elatior*, *Fr.*; pileus cylindrical, then expanded, viscid; disc even, fleshy, otherwise membranaceous and plicato-rugose; stem elongated, soft, stout, attenuated at either end, scaly from the torn veil; gills adnate, very broad, connected by veins, and rugose, brownish-ferruginous.

In woods. Common. Pileus 3-4 inches across, varying in colour, yellowish when dry.

15. *C. (Myxacium) livido-ochraceus*, *B.*; pileus plane,

submembranaceous, viscid, margin not striate; stem attenuated at either end, subsquamose, striate above the fugitive veil, stuffed with cottony fibres; gills cinnamon, subadnexed, broad in front.

In woods. King's Cliffe. Coed Coch. Pileus 1 inch across, livid-ochre. Nearest to the smooth-stemmed form of *C. collinitus*.

Subgenus 3. *INOLOMA*.—Pileus fleshy, dry, at first silky with scales or innate fibres, not hygrophanous; stem bulbous.

16. *C. (Inoloma) violaceus*, *Fr.*; dark-violet; pileus fleshy, obtuse, villososquamose; stem bulbous, spongy, villous, cinereous-violet within; gills broad, fixed, thick, distant.—*Huss. i. t. 12*.

In woods. England and Scotland. Not common. Pileus 4 inches or more across.

17. *C. (Inoloma) callisteus*, *Fr.*; yellow-tawny; pileus fleshy, convexo-plane, at length smooth, even, innato-squamulose; margin rather silky; flesh whitish-yellow; stem elongated, bulbous, clothed with tawny fibres; gills adnate, floccose, connected behind.

In woods. Rare. My *Ag. validus* (see Engl. Fl.) appears certainly to be this species, agreeing with it not only in other respects, but in the minute character of the gills adhering to the stem after they separate by a few flocci. The colours are nearly those of *Ag. aureus*.

18. *C. (Inoloma) Bulliardii*, *Fr.*; pileus fleshy, campanulato-convex, even or squamulose, rufescent; stem short, firm, bulbous, vermilion below and adorned with similarly coloured fibres, white above; gills broad, adnexed, purplish, then ferruginous.—*Bull. t. 431. f. 3*.

In woods. Not common. Bristol, *Dr. Stephens*. This

species is remarkable for the vermilion or brick-red base of the stem.

19. *C. (Inoloma) bolaris*, *Fr.*; pileus fleshy, obsoletely umbonate, growing pale, variegated with innate pilose saffron-red adpressed scales; stem stuffed, then hollow, nearly equal, squamulose, of the same colour as the pileus; gills crowded, subdecurrent, watery-cinnamon. (Plate 19, fig. 1.)

Woods. Rare. King's Cliffe. Argyllshire, *Mrs. Wynne*. Varying in intensity of colour, sometimes merely tinged with red, sometimes bright-red.

20. *C. (Inoloma) pholideus*, *Fr.*; pileus fleshy, expanded, obtusely umbonate, fawn-coloured, densely clothed with innate fasciculate blackish hairs; stem attenuated, rough transversely with dingy-brown scales, even and violet above the veil; gills subemarginate, crowded, violet, then clay-coloured, inclining to cinnamon.

In woods. King's Cliffe. Not common.

21. *C. (Inoloma) sublanatus*, *Fr.*; pileus fleshy, campanulate, expanded, umbonate, tan-coloured, inclining to brown, clothed with little innate scales; stem bulbous, attenuated, smooth above, pallid, clothed below with brown scaly down; gills subadnate, scarcely crowded, olivaceous-yellow.—*Sow. t. 224; Huss. ii. t. 22.*

In woods. Rare. Pileus variable in colour, sometimes shaded with olive.

22. *C. (Inoloma) arenatus*, *P.*; pileus fleshy, convex, at first gibbous, granulated with little floccose scales, light red, changing to brown; stem clavato-attenuated, clothed beyond the middle with little brown scales, even and pale above; gills emarginate, ventricose, rather crowded, yellowish-cinnamon.—*Huss. i. t. 72.*

In woods. Not common. Coed Coch, *Mrs. Wynne*. This

cannot be distinguished safely from *C. pholideus*, except when the specimens are young, in which state the colour of the gills is distinctive.

Subgenus 4. *DERMOCYBE*.—Pileus thin, silky with innate down, dry, not hygrophaneous; stem equal or attenuated, not bulbous.

23. *C. (Dermocybe) ochroleucus*, *Fr.*; pileus fleshy, convex, obtuse, even, nearly smooth, pallid-white; stem solid, firm, ventricose, white, fibrillose above, veiled; gills adnexed, nearly free, crowded, dirty-white, then clayey-ochre.—*Schaff. t. 34.*

In woods. Rare. Mossburnford, *A. Jerdon, Esq.* Pileus about 2 inches across.

24. *C. (Dermocybe) tabularis*, *Fr.*; pileus fleshy, equal, soon flattened, flocculose, then smooth, brownish-clay, becoming pale; stem stuffed, tough, elastic, white, closely fibrillose-squamose or smooth; gills emarginate, crowded, dirty-white, then clay-coloured.—*Bull. t. 431. f. 5.*

In woods. A common species. Distinguished best from *C. anomalus* by the differently coloured gills.

25. *C. (Dermocybe) diabolicus*, *Fr.*; pileus fleshy, thin, hemispherical, obtuse, then gibbous, brownish, clothed with grey threads, at length smooth, yellow-tawny; stem stuffed, rather slender, smooth, pallid, bluish above; gills somewhat emarginate, adnexed, crowded, dirty-white or evanescent pale blue, then ochraceous-cinnamon.

In woods. South of England, *C. E. Broome.*

26. *C. (Dermocybe) caninus*, *Fr.*; pileus fleshy, convex, flattened out, obtuse, at length smooth, bright-rufous, changing colour; stem clavato-bulbous, elastic, closely fibrillose, pallid violet above; gills emarginate, broad, rather distant, purplish, then cinnamon.

In woods. King's Cliffe. Pileus variable in colour.

27. *C. (Dermocybe) anomalus*, *Fr.*; pileus fleshy, thin, convex, obtuse, then gibbous, dingy-rufous, whitish with evanescent fibrils; stem somewhat stuffed, slender, attenuated, fibrillose, slightly scaly, pallid-violet; gills crowded, dente-decurrent, bluish or purple, then cinnamon. (Plate 12, fig. 4.)—*Bull. t.* 431. *f.* 2.

In woods. Very common. Pileus  $2\frac{1}{2}$  inches across. *A. araneosus*, *Sow. t.* 384. *f.* 1, belongs to this, probably, and not to the next.

28. *C. (Dermocybe) spilomeus*, *Fr.*; pileus slightly fleshy, gibbous, dry, at length smooth, brownish, and changing colour; stem rather hollow, slender, white, inclining to lilac, variegated with rufous or tawny scales; gills crowded, emarginate, narrow, bluish-lilac, at length cinnamon.

In woods. Not common. King's Cliffe. Bristol, *Dr. Stephens*. *A. violaceus*, *Sow.*, is undoubtedly *A. personatus*.

29. *C. (Dermocybe) sanguineus*, *Fr.*; pileus fleshy, thin, obtuse, innato-sericeous or squamulose, dark blood-red, as well as the veil and thin, equal, at length bulbous stem; gills crowded, rather broad, darker.—*Sow. t.* 43.

In woods. Not uncommon. Remarkable for its brilliant colour.

30. *C. (Dermocybe) cinnamomeus*, *Fr.*; pileus fleshy, thin, obtusely umbonate, cinnamon-brown, silky with innate yellowish fibrils, or squamulose; stem equal, slender, stuffed, then hollow, yellowish, as well as the flesh and veil; gills adnate, broad, crowded, shining.

In woods. A very common but variable species. Sometimes the gills are red.

31. *C. (Dermocybe) uliginosus*, *n. s.*; pileus campanulato-conical, then expanded, bright red-brown, very strongly um-

bonate, silky, sometimes streaked; flesh yellow-olive, then cinnamon; stem flexuous, paler than the pileus; gills distant, adnate, with a tooth, yellow, then olive, then cinnamon.

In boggy woods, amongst *Sphagnum*, etc. King's Cliffe. Pileus not exceeding 2 inches in diameter, of a beautiful red-brown (almost brick-red), and remarkable for its very strong but scarcely acute umbo.

32. **C. (Dermocybe) raphanoides**, *Fr.*; olive, then changing colour; pileus fleshy, campanulate, then expanded, gibbous, silky with innate fibrils; stem stuffed, firm, fibrillose, opaque, paler than the pileus, as well as the veil; gills adnato-ventricose, rather crowded, olive, then cinnamon.

In beech- and fir-woods. Highlands of Scotland, *Klotzsch*.

Subgenus 5. **TELAMONIA**.—Pileus moist, hygrophanous, smooth, or clothed only with evanescent threads; stem peronate (sheathed with the interwoven veil).

33. **C. (Telamonia) bulbosus**, *Fr.*; pileus slightly fleshy, campanulato-expanded, smooth, bright-brown; disc fleshy, somewhat gibbous; stem stout, bulbous, pallid or paler than the pileus, sheathed with a white veil; ring imperfect; gills adnate, rather distant, opaque, cinnamon.—*Sow. t.* 130.

In woods. Rare. Stem saffron-coloured within.

34. **C. (Telamonia) torosus**, *Fr.*; pileus fleshy, convex, expanded, obtuse, pale red-brown, whitish with squamules or fibrils, at length pierced, smooth; stem stout, sheathed with the white persistent veil, and furnished with a ring; veil at the apex violet; gills thick, distant, very broad, purplish-umber, then cinnamon.—*Bull. t.* 600. *Q. R. S.*

In woods. Not uncommon.

35. **C. (Telamonia) evernius**, *Fr.*; pileus carnosomembraneous, conico-campanulate, expanded, smooth, purplish-bay,

changing to reddish-white, at length fibrillose and torn; stem stout, cylindrical, soft, violet, scaly from the remains of the white veil; gills adnate, very broad, distant, violet, inclining to purple.—*Sow. t.* 125.

In woods. Not uncommon.

36. *C. (Telamonia) armillatus*, *Fr.*; pileus fleshy, campanulate, then expanded, innato-fibrillose and scaly, torn, bright red-brown; margin thin; stem solid, elongated, bulbous, fibrillose, reddish, girt with a red zone; gills fixed, very broad, distant, pallid, then dark-cinnamon.—*Huss. i. t.* 19; *Bull. t.* 527. *f.* 1.

In woods. Uncommon. A large species, remarkable for the blood-red zone on the stem. Mrs. Hussey's plant is the same with Bulliard's, and both seem to me to belong to this species.

37. *C. (Telamonia) limonius*, *Fr.*; pileus fleshy, convexo-plane, obtuse, smooth, tawny, at length rimuloso-squamulose; stem solid, firm, equal, of the same colour, as well as the floccoso-squamose veil; gills adnate and emarginate, rather distant, yellow, then tawny-cinnamon.—*Holmsk. ii. t.* 40.

In pine-woods. Scottish Highlands, *Klotzsch.*

38. *C. (Telamonia) hinnuleus*, *Fr.*; pileus carnosomembranaceous, conico-campanulate, then expanded, subumbonate, smooth, pale tawny-cinnamon, at length pierced; stem stuffed, rigid, tawny, attenuated downwards, girt above with the white silky veil; gills subemarginate, distant, broad, then tawny-cinnamon, quite entire.—*Sow. t.* 173.

In woods. Extremely common. This is said to be distinguished from *C. gentilis* by its white veil, but I fear this character is not constant.

39. *C. (Telamonia) brunneus*, *Fr.*; pileus campanulate, flattened out, umber, naked, broken up into innate fibrils near

the margin; umbo fleshy, obtuse; stem stuffed, elongated, attenuated upwards, elastic, brownish, marked with white streaks, girt with the brownish-white veil; gills adnate, thick, distant, purplish, then cinnamon-umber.

In woods. Not observed since the time of Withering.

40. *C.* (*Telamonia*) *periscelis*, *Weinm.*; pileus campanulate, then convex, lilac and white, silky; umbo fleshy, membranaceous elsewhere; stem equal, fibrillose, of the same colour; veil woven, brownish, forming an imperfect ring; gills adnate, crowded, narrow, pallid, then obscurely ferruginous.

In bogs or under beech-trees. Bowood, *C. E. Broome*.

41. *C.* (*Telamonia*) *psammocephalus*, *Fr.*; tawny-cinnamon; pileus slightly fleshy, convexo-expanded, at length umbonate, furfuraceo-squamulose; stem stuffed, attenuated, squamulose, and sheathed with the continuous veil; gills adnate, arcuate, crowded.—*Bull. t.* 531. *f.* 2.

In woods. Not uncommon. King's Cliffe. Pileus about an inch across.

42. *C.* (*Telamonia*) *ileopodius*, *Fr.*; pileus slightly fleshy, convex, subumbonate, at first clothed with silky white threads, light reddish-yellow, then smooth and tan-coloured, at length even and rimose; stem equal, slender, tawny without and within, sheathed with the pallid veil, naked above, fibrilloso-striate; gills adnate, rather crowded, thin, inclining to cinnamon.—*Bull. t.* 586. *f.* 2 *A, B.*

In woods. Not uncommon. Very variable. Pileus 1-1½ inch across.

Subgenus 6. *HYGROCYPE*.—Pileus hygrophaneous; stem distinct from the fibrillose veil, hence neither annulate nor floccoso-squamose.

43. *C.* (*Hygrocybe*) *Armeniacus*, *Fr.*; pileus subcarnose,

convexo-plane, gibbous, even, smooth, tawny-cinnamon, at length tan-coloured, shining; stem stuffed, conico-attenuated, rigid, soft within, white, as well as the subperonate veil; gills adnate, crowded, pallid, then tawny-cinnamon.—*Schæff. t. 81.*

In pine-woods. Bristol, *Dr. Stephens.*

44. *C. (Hygrocybe) dilutus, Fr.*; pileus somewhat fleshy, convexo-plane, subumbonate, smooth, even, opaque, light-red; stem stuffed, then hollow, soft, pallid, thickened at the base; veil fibrillose; gills emarginate, adnexed, broad, crowded, pale-cinnamon.—*Bolt t. 10.*

In woods, *Bolton.* Not found since his time. Pileus about 2 inches across.

45. *C. (Hygrocybe) castaneus, Fr.*; pileus slightly fleshy, firm, campanulato-convex, flattened out or gibbous, even, chestnut; stem cartilaginous, stuffed, then hollow, even, violet or pale rufous; veil white, fibrillose; gills fixed, ventricose, rather crowded, violet, then ferruginous.—*Bull. t. 268.*

In woods and gardens, on the naked ground. Common. A small species.

46. *C. (Hygrocybe) Reedii, B.*; pileus conical, then expanded and strongly umbonate, smooth, shining, persistently brown; disc areolate; margin splitting; stem white, solid, fibrilloso-striate, slightly bulbous; veil fibrillose, evanescent; gills broad, ventricose, ascending, attenuated behind, free, white or pallid, then cinnamon.—*Huss. ii. t. 45.*

Amongst moss and beech-mast. May. Hayes, Surrey. Pileus one inch across. Stem  $1\frac{1}{2}$ –2 inches high. Tasteless and scentless. Flesh pallid. Allied to *C. leucopus* and *C. Krombholzii.*

47. *C. (Hygrocybe) leucopus, Fr.*; pileus slightly fleshy, conical, then expanded, at length umbonate, even, smooth, light-red; stem stuffed, then hollow, equal, white; gills

slightly adnexed, ventricose, crowded, pallid, then cinnamon.  
—*Bull. t.* 553. *f.* 2.

In woods. Not uncommon.

48. *C. (Hygrocybe) acutus*, *Fr.*; pileus membranaceous, conical, acutely umbonate, striate, light reddish-yellow, at length tan-coloured, shining with a silky lustre; stem fistulose, equal, slender, flexuous, pallid; veil fugacious, white; gills adnate, rather crowded, slender, narrow, ochraceous, quite entire.

On moist spots in woods. Not uncommon. Mr. Jerdon has sent me a cæspitose, obtuse form, with a slightly viscid pileus, approaching *C. pluvius*. I have the same form from the United States. The species comes near to *Galera*.

#### 5. PAXILLUS, *Fr.*

Gills persistent, distinct from and easily separating from the hymenophorum, which is confluent with the stem; trama obsolete.

1. *P. involutus*, *Fr.*; stained when bruised; pileus compact, convexo-plane, then depressed, moist, at length smooth, tomentose about the involute margin; stem solid, fleshy, firm, naked, incrassated upwards, paler, as well as the branched broad gills, which are porous, and anastomose behind. (Plate 12, fig. 5.)

On the ground, amongst grass, and on sandy banks. Very common, sometimes attaining a considerable size. Pileus olive-brown, sometimes tinged with purple.

2. *P. atro-tomentosus*, *Fr.*; pileus convexo-plane, then depressed or funnel-shaped, granulated, rivulose; margin thin, involute; stem solid, spongy, firm, velvety; gills straight, crowded, branched behind.—*Batsch*, *f.* 32.

On stumps of pines, Woodnewton, Northamptonshire. Compton Basset, Wiltshire, *Miss Dalby*. Pileus several inches across, olivaceous-brown; stem sometimes obsolete, when present densely velvety. Withering's *A. aurantio-ferugineus* is referred to this species, but a figure sent to me by Fries shows me that Secretan's quotation must be wrong.

3. *P. Panuoides*, *Fr.*; pileus fleshy, conchate, at length smooth, dirty-yellow, elongated behind, sessile or stipitate; gills crowded, decurrent, branched, dirty-yellow. (Plate 12, fig. 6.)—*Sow. t.* 403.

In cellars, on sawdust, etc. Not common. In profusion at a sawmill, Coed Coch, 1858 and 1859. Closely resembling the last.

#### 6. GOMPHIDIUS, *Fr.*

Pileus top-shaped. Hymenophorum confluent with the stem. Gills slightly branched, formed of a mucilaginous membrane, edge acute. Spores fusiform.

1. *G. glutinosus*, *Fr.*; pileus obtuse, glutinous, purple-brown; gills dirty-white, then cinereous; trama none.—*Sow. t.* 7.

In fir-woods. Not uncommon. Pileus 3 inches across. Stem yellow within, and frequently at the base.

2. *G. viscidus*, *Fr.*; pileus at length umbonate, viscid, brownish-red; gills purple-umber, truly branched; trama like the substance of the pileus.—*Sow. t.* 105.

Under Scotch firs. Larger than the last. Stem deep rhubarb-colour within.

3. *G. gracilis*, *B. and Br.*; pileus conico-hemispherical, clothed with dingy gluten, at length spotted with black; gills of a watery dingy-white, forked; stem slender, sprinkled with minute scales above, virgate below. (Plate 12, fig. 7.)

In fir-woods. Not uncommon. The specimen figured was gathered in Sir C. Anderson's plantations at Lea, near Gainsborough. Pileus scarcely exceeding 2 inches, generally smaller.

### 7. HYGROPHORUS, *Fr.*

Hymenophorum continuous with the stem, and descending without change into the sharp-edged gills; hymenium waxy.

\* *Veil universal, viscid.*

1. *H. chrysodon, Fr.*; white; pileus fleshy, convexo-plane, viscid; margin involute, clothed with little yellow floccose scales, as well as the stuffed, nearly equal stem; gills rather thin, distant, at length crisped.

In woods. Not common. Pileus 2-3 inches broad; gills often edged with yellow glandular flocci. Extremely elegant.

2. *H. eburneus, Fr.*; white; pileus fleshy, even, smooth, glutinous, as well as the stuffed, then hollow, unequal stem, which is dotted above with glandular scales; gills firm, distant, straight. (Plate 15, fig. 1.)

In woods. Not uncommon. Turning a foxy-red in parts, as it decays. Easily distinguished from *H. virgineus*, with which it is often confounded by the glandular scales at the top of the stem.

3. *H. cossus, Fr.*; strong-scented, white; pileus fleshy, even, smooth, viscid, assuming at length a yellowish tinge; stem stuffed, nearly equal, glandular above; gills thin, distant, straight.—*Sow. t.* 121.

In woods. Extremely like the last, but not turning red, and always distinguished by its smell, which is like that of the larva of the goat-moth. When bruised it is sometimes yellow.

4. *H. cerasinus, B.*; pileus fleshy, convex, broadly umbonate, pale umber, then grey, viscid; margin minutely tomen-

tose ; stem white, solid, attenuated below, punctato-squamulose above ; gills broad, decurrent, white, tinged with pink, sometimes forked, very distant.

In fir-plantations. Rare. Winkbourn, Notts. Smell like that of laurel-leaves. Pileus  $1\frac{1}{2}$ – $2\frac{1}{2}$  inches across, sometimes depressed. This does not seem to be the same species with *H. agathosmus*, Fr.

5. *H. aromaticus*, B. ; very tender ; pileus fleshy, smooth, cinnamon, glutinous ; stem stuffed, then hollow, reticulated ; gills pinkish, decurrent when young.—*Sow. t.* 144.

Not found since the time of Sowerby. Smell agreeable, spicy. Turns black when bruised.

6. *H. mesotephrus*, B. and Br. ; pileus convex, subhemispherical, hygrophanous, white, with a brown disc, striate, viscid, as well as the slender stuffed stem, which is floccosogranulated above ; gills decurrent, pure white.—*Ann. of Nat. Hist. ser. 2. vol. xiii. t. 15. f. 2.*

In woods. Rare. Bowood, C. E. Broome. Pileus about 1 inch across. Allied to *H. fusco-albus*.

7. *H. hypothejus*, Fr. ; pileus fleshy, clothed with thin olive evanescent gluten, somewhat virgate ; stem stuffed, equal, viscid, somewhat spotted ; gills distant, yellow.—*Sow. t.* 8.

In pine-woods, especially where the soil is sandy. Not uncommon. Pileus yellowish, often tinged with red. Flesh yellow. Gills sometimes tinged with pink.

8. *H. olivaceo-albus*, Fr. ; pileus fleshy, even, clothed with evanescent olive gluten ; umbo brown ; stem solid, equal, viscid, at first furnished with a floccose ring, spotted with dark scales, even above ; gills white.

In woods and woodland pastures. Not common. Northamptonshire. By no means yellow like the last.

\*\* *Teil none* ; *pileus fleshy, moist, scarcely viscid.*

9. *H. leporinus*, *Fr.* ; *pileus* equally fleshy, convex, gibbous, equal, fibrilloso-floccose, opaque ; stem short, stuffed, firm, attenuated, fibrillose, pallid ; gills decurrent, reddish-grey.—*Schæff. t.* 313.

On downs. Durdham Downs, *C. E. Broome*. Kent, *Mrs. Hussey*. Spores pale umber. *Pileus* yellowish-red, about 2 inches across.

10. *H. pratensis*, *Fr.* ; *pileus* convexo-plane, then turbinate, smooth, moist ; disc compact, gibbous ; margin thin ; stem stuffed, even, attenuated downwards ; gills deeply decurrent, arcuate, thick, distant.—*Grev. t.* 91. *Huss. ii. t.* 40.

On downs and short pastures. Very common. *Pileus* tawny or deep buff, sometimes nearly white, as in the next. Probably esculent.

11. *H. virgineus*, *Fr.* ; *pileus* fleshy, convexo-plane, obtuse, moist, at length arcolato-rimose ; stem stuffed, firm, short, attenuated at the base ; gills decurrent, distant, rather thick.—*Grev. t.* 166.

On downs and short pastures. Extremely common. Mostly pure ivory-white.

12. *H. niveus*, *Fr.* ; *pileus* submembranaceous, campanulato-convex, then umbilicate, smooth, moist, striate, viscid ; stem slender, fistulose, equal ; gills decurrent, then arcuate, distant.—*Kromb. t.* 25. *f.* 1-3.

In mossy pastures. Very common. "White, hygrophalous. Smaller than the last. Disc not truly fleshy, and hence umbilicate, not rimose." I am not prepared to say whether this is truly distinct from the last. Sometimes it is only a few lines across.

13. *H. russo-coriaceus*, *B. and Mill.* ; sweet-scented ; *pileus* ivory-white, slightly viscid, convex, fleshy ; stem slender,

smooth, solid; gills broad, thick, arched, decurrent, very few, and distant.

In exposed pastures. Rare. Walkeringham, Notts, *Rev. T. K. Miller*. Known at once by its persistent delightful odour, like that of Russian leather or *Potentilla atro-sanguinea*. Pileus scarcely exceeding half an inch in diameter.

14. *H. ovinus*, *Fr.*; pileus fleshy, thin, conico-convex, then expanded, gibbous, viscid, squamulose, brown; stem somewhat stuffed, smooth, shining, thickened at either end; gills arcuato-decurrent, connected by veins, white, then dingy; edge thin.—*Bull. t.* 580; *Huss. ii. t.* 50.

In pastures. Not common. Northamptonshire. *Coed Coch. Ag. compressus*, *Sow.*, probably represents this species. Pileus about  $2\frac{1}{2}$  inches across.

\*\*\* *Whole fungus of a watery, succulent substance; veil none.*

15. *H. distans*, *B.*; pileus somewhat fleshy, plane or depressed, viscid, white with a silky lustre, here and there stained with brown; stem white above, cinereous below, and attenuated, not spotted; gills few, very distant, subventricose, decurrent, pure white at first, then tinged with cinereous; interstices obscurely rugose. (Plate 13, fig. 1.)

In woods. Rare. King's Cliffe. June 30, 1859. About 2 inches across. Often umbilicate.

16. *H. Colemannianus*, *Blox.*; pileus subcarnose, umbonate, umber, turning pale except in the centre, even, striate when moist and slightly viscid; stem nearly equal, somewhat silky, whitish; gills rather broad, of the same colour as the pileus, distant, deeply decurrent; interstices venoso-rugose.

In grassy pasture. Twycross, Warwickshire, *Rev. A. Bloxam*. Pileus 1–2 inches across, reddish-umber.

17. *H. lætus*, *Fr.*; pileus thin, convexo-plane, nearly even,

viscid, somewhat shining, tawny, as well as the tough, equal stem; gills subdecurrent, thin, distant, paler.

On open pastures. Not uncommon. Scotland, England, and Wales. Pileus about an inch across, brightly coloured, not turning pale like the last.

18. *H. ceraceus*, *Fr.*; brittle; pileus thin, convexo-plane, obtuse, slightly striate, waxy, yellow as well as the fistulose, unequal, shining stem; gills adnato-decurrent, distant, yellow.—*Sow. t.* 20.

In pastures. Common. Easily known from the other yellow species by the gills.

19. *H. coccineus*, *Fr.*; brittle; pileus thin, convex, obtuse, viscid, scarlet, turning pale, smooth; stem hollow, compressed, yellowish, scarlet above; gills adnate, decurrent with a tooth, connected by veins variously shaded.—*Schæff. t.* 302; *Huss. i. t.* 61.

In open pastures. Extremely common. Nearly allied to the next, but larger.

20. *H. miniatus*, *Fr.*; brittle; pileus thin, convex, then umbilicate, vermilion, soon changing colour and becoming opaque and squamulose; stem somewhat stuffed, equal, polished scarlet; gills adnate, distant, yellow or yellowish-vermilion.—*Kromb. t. 1. f.* 21.

In moist places, on heaths, etc. Common. Requires to be carefully distinguished from the last.

21. *H. puniceus*, *Fr.*; brittle; pileus thin, fleshy, campanulate, obtuse, waved, even, viscid, blood-scarlet, then turning pale; stem thick, hollow, ventricose, striate, white at the base; gills adnexed, thick, distant, yellow.—*Bolt. t. 67. f. 2. t.* 43.

In meadows. Not common. I have a golden-yellow form with an umbilicate pileus and adnate gills, intermediate between this and the next.

22. *H. obrusseus*, *Fr.*; brittle, bright golden-yellow; pileus fleshy, thin, conico-convex, obtuse, waved, nearly dry, even, as well as the hollow, somewhat compressed, smooth stem; gills adnato-ventricose, thick, distant.

In woods. Rare. Mossburnford, *A. Jerdon*.

23. *H. conicus*, *Fr.*; brittle; pileus submembranaceous, conical, acute, smooth, somewhat lobed, at length expanded, rimose, black when bruised or decaying; stem hollow, cylindrical, fibroso-striate; gills attenuated, free, ventricose, then rather crowded.—*Sow. t.* 381.

In pastures. Extremely common. Always known by its turning black. Pileus yellow, scarlet; gills yellow, or shaded with red.

24. *H. psittacinus*, *Fr.*; pileus thin, campanulate, expanded, umbonate, more or less striate, clothed, as well as the tough, even, hollow stem, with green, evanescent gluten; gills adnato-ventricose, thick, distant.—*Sow. t.* 82. *Huss. i. t.* 41.

In fields. Extremely common. Pileus lilac, yellow, white, etc., when the green gluten vanishes. Stem generally green above.

25. *H. calyptræformis*, *B. and Br.*; pileus thin, acutely conical, lobed below, minutely innato-fibrillose; stem white, smooth, slightly striate, hollow; gills rose-coloured, at length pallid, very narrow, acutely attenuated behind.—*A. conicus*,  $\gamma$  *amœnus*, *Lasch. in Linn. iii. p.* 380.

On the borders of woods and in open pastures. Probably not uncommon. Pileus pink, becoming pallid. Very distinct from *H. conicus*. It does not turn black when bruised.

26. *H. unguinosus*, *Fr.*; brittle; pileus thin, campanulato-convex, obtuse, even, clothed with dingy gluten as well as the hollow, unequal stem; gills adnato-ventricose, plane, thick, white, becoming glaucous.

In woods and pastures. Not uncommon. Persistently dingy.

27. *H. murinaceus*, *Fr.*; brittle, strong-scented; pileus thin, campanulate, flattened out, irregular, viscid, soon dry, rimuloso-squamose; stem rather hollow, unequal, somewhat compressed, even; gills adnate, separating, broad, distant, somewhat undulated, white, then glaucous.

In pastures. Not common, *C. E. Broome*. Smell strong, nitrous. This is quite different from *A. murinaceus*, which is a *Tricholoma*.

### 8. LACTARIUS, *Fr.*

Hymenophorum confluent with the stem and vesiculose trama. Gills milky, edge acute.

\* *Gills not decidedly changing colour; milk at first white, acrid.*

1. *L. torminosus*, *Fr.*; pileus fleshy, depressed, somewhat zoned, pallid as well as the equal, stuffed, at length hollow stem; margin involute, bearded; gills thin, dirty-white; milk acrid, white, unchangeable.—*Sow. t.* 103.

In woods, fields, etc. Common. Pileus 3 inches or more across, sometimes tinged with reddish-grey, or flesh-coloured.

2. *L. cilicioides*, *Fr.*; pileus fleshy, soft, depressed, tomentose, zoneless, turning pallid, margin fibrilloso-lanuginous; stem stuffed, even, pruinose, silky, spotless, pallid; gills crowded, branched, white, becoming yellowish as well as the milk.

In pine-woods. Edinburgh, *Greville*. Rare.

3. *L. turpis*, *Fr.*; pileus compact, plane, olive-umber, zoneless, margin at first clothed with yellowish down; stem stuffed, short, viscid, attenuated downwards, olive; gills thin, pallid, milk-white, acrid.—*Kromb. t.* 69. *f.* 1-6.

In fir-woods. Coed Coch. East Bergholt, where Dr. Bad-

ham has shown it to me in great abundance. Pileus several inches across. *A. necator*, Bull., is merely a form of *L. torminosus*.

4. *L. insulsus*, *Fr.*; pileus fleshy, umbilicate, then funnel-shaped, viscid, yellowish, zoned, margin naked; stem stuffed, then hollow, firm, pallid, as well as the crowded, forked gills. (Plate 13, fig. 2.)—*Huss. i. t.* 59.

In woods, and on their borders. Very common. Sometimes attaining a large size. Flesh not compact as in the next. Spores yellowish.

5. *L. zonarius*, *Fr.*; pileus compact, umbilicate, even, viscid, marked with yellowish zones; margin involute, naked; stem short, solid, elastic, even, yellowish; gills thin, crowded, dirty-white; milk white, acrid, unchangeable.—*Bull. t.* 104.

On the borders of woods. Rare. Cotterstock, Northamptonshire. I have not, however, seen it for a great many years. Harsh and woody.

6. *L. blennius*, *Fr.*; pileus fleshy, depressed, glutinous, often concentrically guttate, greenish-grey; margin from the first even, slightly pubescent; stem stuffed, then hollow, viscid, of the same colour; gills crowded, white, as well as the acrid milk.—*Kromb. t.* 69. *f.* 7-9.

In woods. Extremely common. Pileus about  $3\frac{1}{2}$  inches across; gills cinereous when wounded.

7. *L. hysginus*, *Fr.*; pileus fleshy, rigid, umbilicate, even, viscid, flesh-coloured, inclining to red; margin thin, inflexed; stem stuffed, then hollow, smooth, somewhat spotted; gills crowded, white, as well as the acrid milk.—*Kromb. t.* 14. *f.* 15, 16.

In woods. Edgbaston, *Withering*.

8. *L. circellatus*, *Fr.*; pileus fleshy, convex, then plane, waved, viscid, zoned; zones and ferruginous disc, which is

from the first umbilicate, darker; stem solid, firm, attenuated downwards; gills crowded, dirty-white; milk white, acrid.—*Sow. t.* 203.

In woods. Rare. It would seem from Sowerby's drawing that the milk in his plant is white, and if so, Fries is right in referring it to this species. "Pileus brownish or rufous, turning pale, darker under the separable cuticle."

9. *L. uvidus*, *Fr.*; pileus fleshy, thin, convex, then depressed, zoneless, viscid, dingy; margin at first involute, naked; stem soon hollow, viscid, pale; gills thin, crowded, when wounded becoming lilac, as well as the white milk.—*Batsch, f.* 202.

In woods. Not uncommon. Pileus about  $2\frac{1}{2}$  inches across.

10. *L. pyrogalus*, *Fr.*; pileus fleshy, flattened, depressed, somewhat zoned, smooth, even, rather moist, livid-cinereous; stem stuffed, then hollow, pallid, attenuated downwards; gills thin, rather distant, yellowish; milk abundant, white, extremely acrid.—*Kromb. t.* 14. *f.* 1-9.

In woods and meadows. King's Cliffe. Coed Coch.

11. *L. plumbeus*, *Fr.*; pileus compact, convex, then infundibuliform, dry, not polished, dingy, then blackish-brown; stem solid, equal, blunt; gills crowded, yellowish; milk acrid, white, unchangeable.—*Sow. t.* 245.

In woods. Rare. Edinburgh, *Dr. Greville*. Several inches across. Sowerby's plate represents the gills as broad and dingy like the pileus, as well as the milk, but in the original drawing they are pallid, and the milk white.

12. *L. piperatus*, *Fr.*; white; pileus compact, umbilicate, then infundibuliform, rather regular, zoneless, even, smooth; stem solid, thick, very short; gills decurrent, crowded, narrow, dichotomous; milk abundant, acrid, white.—*Kromb. t.* 57. *f.* 1-3.

In woods. Common. Much neater than *L. vellereus*, with narrow gills, which resemble ivory, and sometimes assume a yellowish tint. (Plate 13, fig. 3.)

13. *L. vellereus*, *Fr.*; pileus compact, umbilicato-convex, tomentose, zoncless, margin reflexed; stem solid, blunt, pubescent; gills distant, arcuate, dirty-white; milk acrid, white.—*Sow. t.* 204; *Huss. i. t.* 63.

In woods. Extremely common. Attaining a large size. A form occurs which is quite juiceless, and is almost as common (*A. exsuccus*, *Auct.*).

\*\* *Aromatic; gills becoming pallid; milk always coloured.*

14. *L. deliciosus*, *Fr.*; pileus fleshy, umbilicate, viscid, zoned, smooth, rufous-orange, turning pallid, margin smooth; stem stuffed, then hollow, somewhat spotted; gills and milk at first saffron-red, at length greenish.—*Sow. t.* 202; *Huss. i. t.* 67.

In fir-woods. Often very abundant, but rare in some localities. Esulent. The gills, when wounded, turn a dull green, like the milk. Pileus 4–5 inches across. Slightly acrid.

\*\*\* *Gills changing colour, dusted with the white spores; milk at first white, mostly mild.*

15. *L. theiogalus*, *Fr.*; pileus fleshy, convex, then depressed, viscid, smooth; stem stuffed, even, of the same colour; gills thin, crowded, yellowish; milk white, then sulphur-coloured.—*Kromb. t. 1. f.* 23, 24.

In woods. Very common. Pileus ochraceous or tawny, zoned or zoneless, 2–3 inches across. Smell spicy.

16. *L. chrysorrheus*, *Fr.*; pileus slightly fleshy, umbilicate, then funnel-shaped, pinkish-yellow, with darker zones or spots; stem stuffed, then hollow, equal, even, white; gills thin, de-

current, crowded, yellowish; milk very acrid, white, then golden-yellow.—*Kromb. t. 12. f. 7-14; Bolt. t. 144.*

In woods. Not common. Scotland, *Klotzsch*. Pileus 2-3 inches across.

17. *L. acris*, *Fr.*; pileus fleshy, irregular, at length funnel-shaped, viscid, dingy-cinereous; stem stuffed, then hollow, subexcentric, pallid, attenuated downwards; gills rather crowded, pale yellow, turning red as well as the white milk.—*Bolt. t. 60.*

In woods. Rare. Scotland, Dorsetshire, etc. Not always excentric, nor does the milk always change its colour with equal intensity.

18. *L. pallidus*, *Fr.*; pileus fleshy, depressed, obtuse, smooth, viscid, zoneless, pallid, as well as the stuffed, then hollow, stout, firm stem; margin thin, inflexed; gills crowded, white, then pallid, pruinose; milk mild, white.—*Kromb. t. 56. f. 10-14.*

In woods. Bowood, *C. E. Broome*. A large species.

19. *L. quietus*, *Fr.*; pileus fleshy, depressed, obtuse, at first viscid, soon dry, turning pale, somewhat zoned, opaque, rufescent, as well as the stuffed, smooth stem; gills white, then reddish; milk mild, white.—*Kromb. t. 40. f. 1-9.*

In woods. "Known by its at first pinkish, somewhat silky, pileus, which is darker in the centre and obsoletely zoned, its spongy, at length rubiginous stem, and the evanescent slime."

20. *L. volemum*, *Fr.*; pileus compact, rigid, plano-depressed, obtuse, dry, of a golden tawny, at length rimoso-rivulose; stem solid, hard, blunt, pruinose; gills crowded, white, becoming yellowish; milk abundant, mild, white.—*Huss. i. t. 87.*

In woods. Not common. King's Cliffe, etc. Pileus 4 inches across. Esculent.

21. *L. seriffuus*, *Fr.*; pileus fleshy, plane, then depressed,

subflexuous, dry, smooth, zoncless, brownish-tawny, margin inflexed; stem solid, equal, somewhat incurved, paler, turning yellowish, as well as the crowded gills; milk sparing, of the colour of serum. (Plate 13, fig. 4.)

In woods. Common. Milk of a watery-white.

22. *L. mitissimus*, *Fr.*; pileus thin, fleshy, convex and smooth, then depressed, papillate, dry, zoncless, even, orange, as well as the stuffed, then hollow stem; gills crowded, paler; milk mild, white.

In woods and on hedge-banks. Not uncommon. Very abundant about Coed Coch, and extremely beautiful.

23. *L. subdulcis*, *Fr.*; pileus thin, fleshy, papillate, at length depressed, polished, even, zoneless, rufous-cinnamon; stem stuffed, then hollow, equal, subpruinose, becoming rufous, as well as the brittle, crowded gills; milk scarcely acrid, white.—*Sow. t.* 204.

In woods. Very common.

24. *L. camphoratus*, *Fr.*; pileus fleshy, thin, depressed, dry, somewhat zoned, smooth, brownish-red, as well as the stuffed, somewhat undulated stem; gills crowded, yellow-red; milk mild, white.—*Bull. t.* 567. *f.* 1.

In woods. Not very common. Bristol, *Dr. Stephens, C. E. Broome*. Known by its powerful smell of Melilot, which it retains for a long time in the herbarium. Pileus  $1\frac{1}{2}$  inch across.

25. *L. rufus*, *Fr.*; pileus fleshy, umbonate, at length funnel-shaped, dry, flocculose, then smooth and shining, zoncless, dark rufous; stem stuffed, rufous; gills crowded, ochraceous and rufous; milk white, extremely acrid.—*Huss. i. t.* 15.

In fir-woods. In most districts very common. The umbonate pileus and acrid milk at once distinguish this dangerous fungus from the five preceding species.

26. *L. glyciosmus*, *Fr.*; pileus thin, fleshy, convexo-plane, somewhat umbonate, dry, squamulose, lurid, opaque; stem stuffed, slender, pubescent, pallid; gills crowded, yellowish-ochre; milk acrid, white.

In fir-woods. Scotland, *Dr. J. C. Bauchop*, etc. Remarkable for its peculiar, sweet, but oppressive smell.

27. *L. fuliginosus*, *Fr.*; pileus fleshy, soft, depressed, obtuse, quite dry, zoneless, at first clouded with a dingy bloom, then naked and cinereous-tan, as well as the spongy, stuffed stem; gills crowded, tan-coloured; flesh and acrid milk white, then saffron-coloured.—*Bull. t. 567. f. 3.*

In woods. Very common. Spores yellowish. The change of colour in the flesh is often more striking than in the milk.

### 9. RUSSULA, *Fr.*

Hymenophorum continuous with the vesiculose trama. Gills rigid, not milky; edge acute. Veil none.

\* *Pileus fleshy all over; margin consequently even and without striæ; not clothed with a distinct, viscid pellicle.*

1. *R. nigricans*, *Fr.*; pileus fleshy all over, compact, umbilicate, depressed, dingy-olive; margin inflexed, even, charred as well as the solid, blunt stem; gills rounded, thick, distant, unequal.—*Sow. t. 30; Huss. t. 73.*

In woods. Extremely common. Turning quite black in decay. Flesh reddish when cut. Pileus several inches across.

2. *R. adusta*, *Fr.*; pileus fleshy all over, compact, depressed, then somewhat funnel-shaped; margin at first inflexed, smooth, then erect, even, dingy, cinereous as well as the blunt, solid stem; gills adnate, then decurrent, thin, crowded, unequal.—*Kromb. t. 70. f. 7-13.*

In woods. Not common. Coed Coch. Smaller than the last.

3. *R. delicia*, *Fr.*; pileus fleshy all over, firm, umbilicate, even, shining; margin involute, smooth, even, white, as well as the solid, compact stem; gills thin, decurrent, distant, white.

In woods. Not common. King's Cliffe. Resembling *Lactarius vellereus*, from the juiceless state of which it requires to be carefully distinguished. Bolt. t. 28 is referred by Fries doubtfully to *R. elephantina*. He evidently confused it with *Russula fœtens*.

\*\* *Pileus opaque, clothed with a thin, closely adnate pellicle, viscid when moist, but which disappears when the plant is old; margin at length striate, but never tuberculate.*

4. *R. sanguinea*, *Fr.*; acrid; pileus firm, fleshy, convex, then depressed and gibbous, at length even, moist; margin thin, acute, even; stem solid, spongy, slightly striate, white or pinkish; gills thin, decurrent, very crowded, somewhat forked, connected, white.—*Bull. t. 42.*

In woods. Not common. King's Cliffe, etc. Gills narrow; flesh very firm. Pileus generally blood-red.

5. *R. rosacea*, *Fr.*; at length acrid; pileus compact, convexo-plane, unequal, viscid, then dry, variegated with spots; margin acute, even; stem solid, spongy, even, white or pinkish; gills adnate, rather crowded, plane, unequal, white, divided behind.—*Bull. t. 509. f. Z.*

In woods. Not common. Fineshade, Northamptonshire. Pileus generally deep red.

6. *R. furcata*, *Fr.*; mild, at length bitter; pileus fleshy, rigid, at length depressed, funnel-shaped, even, partially shining, with a silky lustre, at length smooth; margin even, acute; stem stout, firm, even, attenuated downwards, white as well as the adnato-decurrent, rather thick, somewhat distant, forked gills.—*Kromb. t. 62. f. 1, 2.*

In woods. Common. Generally greenish, but variable in colour.

7. *R. vesca*, *Fr.*; mild, sweet to the taste; pileus firm, fleshy, umbilicate, convex, then expanded, funnel-shaped, venoso-rugose; flesh reddish under the viscid pellicle; margin even, or at length remotely striate; stem firm, unequal, rivuloso-rugose, white, as well as the adnate, rather crowded, unequal, forked gills.—*Bolt. t. 1.* (*Huss. i. t. 89.*)

In woods. Not common. Esculent. Kent, *Mrs. Hussey.*

8. *R. heterophylla*, *Fr.*; mild; pileus firm, fleshy, convexo-plane, then depressed, even, polished; pellicle very thin, evanescent; margin thin, even, or densely striate; flesh white; stem solid, firm, nearly equal, even, white, as well as the attenuated, nearly free, very crowded, forked, and dimidiate gills. (Plate 13, fig. 5.)—*Huss. i. t. 84.*

In woods. Common. Esculent. Very variable in colour.

9. *R. depallens*, *Fr.*; mild; pileus firm, fleshy, undulated, irregular, even, opaque; pellicle thin, viscid, adnate, turning pale; margin even, at length slightly striate; stem firm, attenuated downwards, white, becoming cinereous; gills adnexed, crowded, brittle, forked behind, dirty-white.—*Kromb. t. 66. f. 12, 13.*

In pastures. Laxton, Northamptonshire. Stem in my specimens spongy, and not attenuated. Pileus red, changing to white.

10. *R. sardonia*, *Fr.*; pileus fleshy, firm, convexo-plane, then depressed, smooth; pellicle thin, adnate, viscid, changing colour; margin even; stem solid, spongy, short, white or reddish; gills adnate, very crowded, somewhat forked, yellow.—*Kromb. t. 68. f. 1-4.*

Near paths in fir-woods, as at Coed Coch. A small species. Pileus dull yellow.

\*\*\* *Pileus without any viscid pellicle, dry, commonly breaking up into flocci and granules; margin straight, not striate.*

11. *R. rubra*, *Fr.*; acrid; pileus fleshy, rigid, convex, then flattened or depressed, dry, polished, at length even; margin patent, obtuse, even; stem hard, solid, stout, white or red; gills obtusely adnate, rather crowded, dirty-white, often forked and dimidiate.—*Kromb. t. 65.*

In woods. Not uncommon. A splendid species. Pileus generally intensely red. Flesh grumous.

12. *R. lepida*, *Fr.*; mild; pileus fleshy, compact, convex, then depressed, unpolished, slightly silky or rimoso-squamose, turning pale; margin patent, obtuse, even; stem solid, compact, even, white or pink; gills rounded, rather thick and crowded, many of them forked, white.—*Huss. ii. t. 32.*

In woods. Kent, *Mr. Hussey*. Esculent.

13. *R. virescens*, *Fr.*; mild; pileus firm, fleshy, globose, then expanded and umbilicate, innato-flocculose or areolate and warty; margin straight, obtuse, even; stem solid, spongy, stout, subrivulose, whitish as well as the free, rather crowded, unequal, and forked gills. (Plate 13, fig. 6.)—*Huss. ii. t. 11.*

In woods. Not very common. Esculent. Pileus greenish. Easily known by the rough surface of the pileus.

\*\*\*\* *Pileus brittle, clothed with a viscid cuticle; margin connivent, but not involute, generally sulcate and tuberculate.*

14. *R. emetica*, *Fr.*; acrid; pileus fleshy, flattened out or depressed, polished, shining; margin patent, at length sulcate; flesh white under the separable red cuticle; stem solid, spongy, firm, elastic, even, white or pink; gills free, equal, broad, rather distant, white.—*Kromb. t. 66. f. 4-7.*

In woods, but not common. A large and fine species.

15. *R. ochroleuca*, *Fr.*; acrid; pileus fleshy, flattened out

or depressed, polished, adnato-pelliculose, turning pale; margin patent, even; stem spongy, stuffed, firm, reticulato-rugulose, white, then cinereous; gills rounded behind, connected, broad, nearly equal, white, becoming pallid.—*Kromb. t. 64. f. 7-9.*

In fir-woods. Apethorpe, Northamptonshire. Pileus bright pale ochre.

16. *R. fœtens*, *Fr.*; acrid, fetid; pileus bullate, then expanded or depressed, rigid, viscid from the adnate pellicle; disc fleshy; margin widely membranaceous, tuberculoso-sulcate; stem stout, stuffed, then hollow, dirty-white, as well as very unequal and forked, venoso-anastomosing, and at first guttate gills.—*Sow. t. 415.*

In woods. Extremely common. Known at once by its disagreeable smell. Much eaten by slugs.

17. *R. fragilis*, *Fr.*; very acrid; pileus fleshy, thin, plane, depressed, unequal, polished, viscid from the thin bleaching pellicle; margin tuberculoso-striate; stem stuffed, then hollow, shining; gills fixed, thin, crowded, ventricose, white.—*Kromb. t. 64. f. 12-18.*

In woods. The most common species. Generally red, but assuming a variety of other hues.

18. *R. integra*, *Fr.*; mild; pileus fleshy, expanded or depressed, viscoso-pelliculose, changing colour; margin thin, at length sulcate and tuberculate; flesh white; stem stuffed, spongy, even, ventricose, white; gills almost free, very broad, equal, distant, white, then pallid, dusted with yellow.—*Vitt. t. 21.*

In woods. Bristol, *C. E. Broome.*

19. *R. aurata*, *Fr.*; at length acrid; pileus fleshy, rigid, convexo-plane, shining; margin at length striate; flesh under the viscid pellicle lemon-coloured; stem compact, spongy,

slightly striate, white or yellowish; gills rounded, free, broad, equal, shining, with the edge bright yellow.—*Kromb. t. 66. f. 8-11.*

In woods. Bristol, *C. E. Broome*. One of the handsomest of the genus. Pileus bright-orange, etc.

20. *R. decolorans*, *Fr.*; mild; pileus fleshy, firm, spherical, then expanded or depressed, polished, thin, pelliculose, turning pale; margin thin, even, fleshy and spongy; stem solid, elongated, rugoso-striate, cylindrical, white, changing to cinereous; gills furcato-adnexed, thin, crowded, white, then yellowish.

In woods. Northamptonshire. September 16, 1837. Pileus scarlet above, 5 inches across; stem  $4\frac{1}{2}$  inches high,  $1\frac{1}{4}$  thick.

21. *R. nitida*, *Fr.*; nauseous, rather fetid; pileus slightly fleshy, at length rigid, convexo-plane, then depressed, shining; margin thin, from the first striate and tuberculate; flesh white; stem stuffed, soft, white, becoming pallid; gills adnexed and seceding, thin, crowded, shining, white, then yellow. (Plate 13, fig. 7.)—*Kromb. t. 66. f. 1-3.*

In woods. King's Cliffe. Small. Pileus variable in colour.

22. *R. alutacea*, *Fr.*; mild; pileus fleshy, obtuse, expanded or depressed, viscoso-pelliculose, changing colour; margin thin, at length striate, tuberculated; flesh white; stem stout, spongy, solid, white or red, even; gills at first free, thick, equal, rather distant, tan-coloured from the first. (Plate 13, fig. 8.)

In woods. Very common. Esculent. Easily known by its large size, mild taste, and gills, which are yellow in every stage of growth.

23. *R. lutea*, *Fr.*; mild; pileus rather firm, plano-depressed, pelliculoso-viscid, turning pale; flesh white; margin

even; stem stuffed, then hollow, soft, white; gills free, crowded, connected by veins, egg-yellow.—*A. luteus*, *Huds.*

In woods. Scotland, *Klotzsch.* Small. Pileus yellow.

24. *R. vitellina*, *Fr.*; strong-scented, mild; pileus submembranaceous, self-coloured, at length tuberculato-striate; disc minute, slightly fleshy; stem slender; gills distant, connected by veins, nearly free, equal, saffron-yellow.—*Batsch*, *f.* 72.

In fir-woods, etc. Not uncommon. A small species, scarcely exceeding an inch in diameter, with a short slender stem. Pileus mostly yellow, occasionally tinged with purple. Not, I think, always strong-scented.

#### 10. CANTHARELLUS, *Fr.*

Hymenophorum inferior, confluent with the floccose trama. Gills thick, swollen, somewhat branched. Edge obtuse.

1. *C. cibarius*, *Fr.*; egg-yellow; pileus fleshy, at first curved, smooth, at length turbinate; stem solid, attenuated downwards; gills thick, distant, of the same colour.—*Grev.* *t.* 258.

In woods. Common. Esculent. Smell like that of ripe apricots. Taste agreeable, but pungent. There is a white variety of this, as also of the next.

2. *C. aurantiacus*, *Fr.*; of a more or less decided orange; pileus fleshy, soft, depressed, tomentose, unequal, as well as the stuffed stem; gills crowded, straight, darker than the pileus. (Plate 14, fig. 1.)

In fir-woods and on heaths. Common. Smaller than the last, often extremely beautiful. Stem frequently black at the base. Scarcely esulent.

3. *C. Brownii*, *B. and Br.*; ochraceous-white or cream-

coloured; pileus thin, convex, subumbonate; stem slender, tough, stuffed; folds rather distant, linear, extremely narrow, sometimes forked, obtusely decurrent.—*Ann. of Nat. Hist. ser. 2. vol. ii. p. 262.*

Amongst grass. In the park at Hitchin, *Mr. J. Brown.* Pileus about  $\frac{1}{2}$  an inch across; stem slender,  $1\frac{1}{2}$ –2 inches high. A very interesting and distinct species.

4. *C. umbonatus, P.*; pileus fleshy, thin, umbonate, then depressed, flocculose, cinereous-black; stem stuffed, equal, paler; gills straight, crowded, white.

Amongst moss. Mossburnford, *A. Jerdon, Esq.* Resembles closely an Agaric, but the forked, obtuse gills, if properly observed, are decisive as to its affinities.

5. *C. tubæformis, Fr.*; pileus carnosio-membranaceous, funnel-shaped, curved and lobed, flocculose, brownish, turning pale; stem smooth, hollow, orange-tawny, at length compressed and lacunose; gills thick, distant, branched, yellow or dingy, naked.—*Ditm. in Sturm, i. t. 30.*

In woods. Not uncommon. Remarkable for the bright tint of the stem. *C. lutescens, Fr., Bull. t. 473. f. 3,* has a paler yellow stem, and the gills less divided; the pileus, moreover, is merely umbilicate. It is scarcely to be deemed a species. It occurs in the same localities with *C. tubæformis.*

6. *C. infundibuliformis, Fr.*; pileus submembranaceous, umbilicate, then funnel-shaped, floccoso-rugose, dingy-yellow, turning pale; stem fistulose, even, smooth, yellow; gills thick, distant, dichotomous, yellow or cinereous, at length pruinose.—*Sow. t. 47.*

In woods. Not uncommon, but difficult to distinguish from the last.

7. *C. cinereus, Fr.*; pileus submembranaceous, infundibuliform, pervious to the base, villosio-squamulose, dingy-black,

as well as the hollow stem; gills thick, distant, cinereous.—*Kromb. t. 45. f. 12; Bolt. t. 34.*

In woods. Rare. Not found since the days of Bolton.

8. *C. muscigenus*, *Fr.*; pileus submembranaceous, spatulate, horizontal, smooth, zoned, brown, then cinereous-white; stem even, lateral, villous at the base; gills swollen, distant, branched, of the same colour.—*Bull. t. 288, 498. f. 1.*

On the larger mosses. Not common. Berwick, *Dr. Johnston*, on *Tortula ruralis*. Bristol, *C. E. Broome*.

9. *C. retirugus*, *Fr.*; thin-membranaceous, expanded, lobed, curved, fixed behind with little threads, pale cinereous-white; gills radiating from the centre, very delicate, reticulate. (Plate 14, fig. 2.)

On mosses, in swamps. King's Cliffe, in tolerable abundance.

10. *C. lobatus*, *Fr.*; membranaceous, sessile, horizontal, lobed, brown; gills fold-like, distinct, banded, diverging.—*Bolt. t. 177.*

On mosses, in swamps. Not common. Very nearly allied to the last.

## 11. NYCTALIS, *Fr.*

Hymenophorum confluent with the stem and trama. Gills fleshy, juicy, or subgelatinous, obtuse, unequal. Often parasitic on other Fungi. Veil universal.

1. *N. asterophora*, *Fr.*; pileus rather fleshy, hemispherical, breaking up into a pulverulent fawn-coloured stratum; stem stuffed, pruinose, white, then brownish, twisted; gills adnate, distant, somewhat forked, straight, dingy.—*Ditm. in Sturm, t. 26.*

On dead dried Agarics. Common. The meal which covers the pileus when full-grown consists of stellate bodies, which

appear to be a second form of fruit. See De Bary, in Bot. Zeit. 1859.

2. *N. parasitica*, Fr.; pileus slightly fleshy, conical, expanded, unequal, pellicle persistent, grey, pruinose; stem minutely fistulose, flocculoso-villous, whitish; gills adnate, thick, distant, at length contorted and anastomosing, brownish. (Plate 19, fig. 2.)

On *Russula adusta*. Common. In this species also De Bary finds a second form of fruit, though different from the last, and confined to the gills.

## 12. MARASMIUS, Fr.

Hymenophorum confluent with the stem, though different in texture, descending into the floccose trama. Hymenium dry, covering the interstices as well as the gills. Gills or folds thick, tough, and subcoriaceous. Edge acute.

\* *Pileus tough, but fleshy; margin at first involute; mycelium floccose.*

1. *M. urens*, Fr.; acrid; pileus fleshy, then coriaceous, convexo-explanate, smooth, even, at length wrinkled or rivulose; stem solid, fibrous, rigid, pallid, mealy all over with little white fibrils, and clothed with white down at the base; gills free, united behind, pallid and yellowish, at length brownish, firm, distant, finally remote. (Plate 14, fig. 3.)

In woods and pastures. Not uncommon. Abundant in the Kew Gardens, mixed with *M. oreades*. Very nearly related to the next.

2. *M. peronatus*, Fr.; acrid; pileus thin, coriaceous, convexo-plane, obtuse, opaque, at length lacunose; margin striate; stem stuffed with fibres, outer coat villous, yellowish, then ru-

fescent, peronate and strigose at the base; gills adnexed, seceding, rather thin and crowded, pallid, at length rufous. (Plate 14, fig. 4.)

In woods, amongst leaves. Common. Rather larger than the last, thinner, and far more wrinkled when old. Stem clothed at the base with dense yellow strigæ.

3. *M. porreus*, *Fr.*; garlic-scented; pileus coriaceo-membranaceous, convexo-explanate, striate, flaccid; disc even, of the same colour; stem stuffed, then hollow, tough, juiceless, thickened at either end, reddish-brown, pubescent; gills nearly free, distant, firm, yellowish, then pallid.—*Sow. t.* 81.

In woods, amongst leaves, generally growing on their mid-ribs. Not common. Smell extremely strong, sometimes persistent for years in dried specimens. Pileus dirty-white, shaded with brown.

4. *M. oreades*, *Fr.*; pileus fleshy, tough, convexo-plane, then somewhat umbonate, smooth, turning pale; stem solid, equal, covered with a woven villous coat, pallid, naked at the base; gills free, broad, distant, cream-coloured. (Plate 14, fig. 5.)

In exposed pastures, forming rings. Very common. Esulent. Pileus at first rufous-ochre, nearly cream-coloured when old or dry.

5. *M. fusco-purpureus*, *Fr.*; scentless; pileus rather fleshy, convexo-plane, subumbilicate, turning pale; stem smooth, fistulose, juiceless, brown-purple, with rubiginous strigose hairs at the base; gills annulato-adnexed, at length free, distant, rufescent.—*Pers. Ic. et Descr. t. 4. f.* 1, 3.

In woods. Common. Pileus at first brown-purple, pallid when dry.

6. *M. Wynnei*, *B. and Br.*; inodorous, cæspitose; pileus fleshy, convexo-plane, subumbonate, lilac-brown, tardily

changing colour; stem fistulose, of the same colour, furfuraceous; gills thick, distant, adnexed, bright-coloured. (Plate 19, fig. 3.)

Amongst leaves, twigs, etc. Coed Coch, abundant. Pileus 1-1½ inch across, variously tinged with brown and lilac. Very beautiful.

7. *M. Stephensii*, *B. and Br.*; caespitose; pileus depressed, rugose in the centre, cream-coloured, stained with vinous-red, especially when bruised; stem hollow, twisted, white and mealy above, shining and nut-brown below; gills distant, dirty-white.—*Ann. of Nat. Hist. ser. 2. vol. xiii. p. 403.*

Amongst dead beech-leaves. Dursley, *Dr. Stephens*. Pileus ½-1 inch across. Taste and smell like that of *M. oreades*.

8. *M. erythropus*, *Fr.*; inodorous; pileus slightly fleshy, convexo-plane, then obtuse, even, turning pale, at length wrinkled; stem fistulose, striate, smooth, dark-red, somewhat pruinose when dry, clothed with white strigose hairs at the base; gills nearly free, broad, connected by veins, quite entire, dirty-white.

Amongst leaves, near stumps. Not uncommon. Gills not crowded. Pileus pallid, sometimes shaded with pink. Walls of cavity of stem fibrillose.

9. *M. archyropus*, *Fr.*; inodorous, fasciculate; pileus slightly fleshy, convexo-plane or depressed, smooth, turning pale; stem stuffed, then hollow, rigid, straight, pale-rufous beneath the white pruinoso-tomentose bark; gills adnexed, seceding, crowded, linear, pallid.—*Pers. Myc. Eur. t. 25. f. 4.*

Amongst leaves. Rare. Bristol, *H. O. Stephens*. Pileus about 1 inch across, tan-coloured. A small but elegant species.

10. *M. scorodonius*, *Fr.*; garlic-scented; pileus slightly fleshy, tough, even, soon plane, rugulose and crisped; stem

fistulose, equal, quite smooth, everywhere shining, rufous; gills adnate, crisped, dirty-white.—*Lenz. f.* 17.

Heaths and dry pastures, on twigs, etc. Rare. Bungay, *Mr. Stock*. Esculent. Pileus rufous, changing to white.

11. *M. Vaillantii*, *Fr.*; inodorous; pileus submembranaceous, tough, soon expanded, depressed, plicato-rugose, becoming white; stem stuffed, smooth, bright-brown downwards, paler and thickened above; gills broad, adnate, thick, distant, white.—*Vaill. t.* 11. *f.* 21–23.

On dead wood. Abundant in a stove at the Royal Botanic Gardens, Regent's Park.

12. *M. fœtidus*, *Fr.*; garlic-scented; pileus submembranaceous, tough, convex, then expanded and umbilicate, striatoplicate when dry, turning pale, somewhat pruinose; stem fistulose, bright-brown, pruinose or velvety; base flocculose, inserted into the matrix; gills annulato-adnexed, distant, rufous-yellow.—*Sow. t.* 21.

On decayed twigs, etc. Rare. Warwickshire, *Rev. A. Bloxam*. Bristol, etc. Pileus not exceeding an inch in diameter, at first tawny-bay or rufous.

13. *M. amadelphus*, *Fr.*; inodorous; pileus carnosomembranaceous, obtuse, convex, then plane or depressed; margin at length striate; stem short, stuffed, pallid, bright-brown below, somewhat mealy; gills broadly adnate, distant, broad, pallid.—*Bull. t.* 550. *f.* 3.

On dead branches. Rare. Bristol, *Dr. Stephens*. Bath, *C. E. Broome*, etc. Pileus reddish or yellowish. Looks like minute specimens of *Agaricus fascicularis*.

14. *M. ramealis*, *Fr.*; inodorous; pileus slightly fleshy, plane or depressed, obtuse, without striæ opaque, rugulose; stem short, stuffed, mealy, white, rufous below; gills adnate, rather distant, narrow, white.—*Bull. t.* 336.

On dry dead branches in woods. Extremely common. Pileus silky under a lens, paler rufous, darker in the centre; gills pallid when old.

15. *M. candidus*, *Fr.*; white; pileus submembranaceous, hemispherical, then plane and depressed, pellucid, naked, at length sulcato-rugulose; stem stuffed, thin, incurved, minutely pruinose, floccose at the base, and at length brownish; gills adnexed, ventricose, distant.—*Bolt. t. 39. f. D.*

On twigs, etc. This species, as a native of Britain, rests on the quotation by Fries of Bolton's figure.

\*\* *Stem horny, tough, dry; mycelium rhizomorphoid; pileus submembranaceous; edge at first straight.*

a. *Stem smooth.*

16. *M. androsaceus*, *Fr.*; pileus membranaceous, convex, subumbilicate, striate, smooth; stem horny, fistulose, quite smooth, black; gills adnate, distinct, simple, whitish.—*Sow. t. 94.*

On leaves, etc., in woods. Extremely common. Pileus pale-rufous, darker in the centre, minutely silky under a lens.

17. *M. rotula*, *Fr.*; pileus membranaceous, convex, umbilicate, plicate; stem horny, shining, quite smooth, black; gills broad, few, distant, attached to a collar, distinct from the stem. (Plate 14, fig. 7.)

On fallen twigs, decaying chips, etc., in gardens and woods. Extremely common. Pileus nearly white.

18. *M. graminum*, *B. and Br.*; pileus nearly plane, umbonate, sulcate, very pale rufous, the furrows paler, umbo brown; stem quite smooth, shining, black, white above; gills few, subventricose, cream-coloured, attached to a free collar. (Plate 14, fig. 8.)—*Agaricus graminum*, *Libert. n. 119.*

On leaves of grass. Fineshade, Northamptonshire, Aug. 8,

1859, *M. J. B. and Mr. Currey*. South of England, *C. E. Broome*. Scarcely exceeding 3 lines in breadth. Gills even, with veiny interstices. A most elegant species, and quite distinct from *M. rotula*.

19. *M. alliaceus*, *Fr.*; garlic-scented; pileus submembranaceous, campanulate, then expanded, somewhat umbonate, even, then sulcate, turning pale; stem horny, tall, rigid, black, between velvety and pruinose, base rooting, naked; gills free, brownish-white.—*Jacq. Aust. t. 82*.

In woods. Rare. Edinburgh, *Capt. Wauch*. Not at all allied to the species which follow.

b. *Stem velvety and pilose*.

20. *M. perforans*, *Fr.*; fetid; pileus submembranaceous, nearly plane, not striate, rugulose, smooth; stem equal, velvety, dark-bay, inserted at the base; gills adnate, simple, dirty-white, frequently dimidiate.—*Batsch, f. 10*.

On fir-leaves. Not common. Scotland.

21. *M. insititius*, *Fr.*; inodorous; pileus membranaceous, tough, convexo-plane, subumbilicate, unpolished, at length plicato-sulcate; stem horny, floccoso-furfuraceous, reddish-brown, attenuated downwards into the simple inserted base; gills broadly adnate, attenuated in front, distant, simple, unequal, pallid, white. (Plate 14, fig. 6.)

On leaves, decayed grass, etc. Northamptonshire. In several localities. This is a variable plant. Some specimens agree exactly with a figure sent to me by Fries, and with the character; in others the stem is paler and the pileus less plicate. The stem, however, is not attenuated downwards. Sometimes the disc is reticulated. The pileus is generally nearly white. I have one specimen with a rhizomorphoid mycelium. My plant is exactly *Agaricus calopus*, *Libert*.

22. *M. Hudsoni*, *Fr.*; inodorous; pileus membranaceous,

hemispherical, rugulose, beset with scattered purple bristles, as well as the horny, dark purple stem; gills adnexed, narrow, simple, white.—*Sow. t.* 164.

On fallen holly-leaves. Southern counties and Wales. Not uncommon. One of the most exquisite of Fungi.

23. *M. saccharinus*, *Fr.*; pileus membranaceous, convex, subpapillate, smooth, sulcate and plicate; stem very slender, flocculose, then smooth, reddish, inserted obliquely; gills broadly adnate, thick, narrow, very distant, connected by veins, dirty-white.

On dead twigs. Rare. King's Cliffe.

24. *M. epiphyllus*, *Fr.*; pileus membranaceous, nearly plane, at length umbilicate, smooth, plicato-rugose; stem rather horny, finely velvety, bright brown below, inserted; gills adnate, few, distant, entire, veiny, white.—*Sow. t.* 93.

On fallen leaves, twigs, etc., especially ash-petioles. Extremely common. Pileus white. Sometimes almost destitute of gills.

\*\*\* *Stemless.*

25. *M. spodoleucus*, *B. and Br.*; conchiform, resupinate; margin at length free, cinereous above, pulverulent or slightly furfuraceous; stem wanting; gills few, white; interstices even.—*Ann. of Nat. Hist. May* 1859.

On dead elm-twigs. Bathcaston, *C. E. Broome*. Gills narrow, entire, leaving a naked space at the base.

### 13. LENTINUS, *Fr.*

Coriaceous, fleshy, and tough, at length hard, tough, dry. Gills tough. Edge acute, toothed. Hymenophorum homogeneous with the stem.

1. *L. tigrinus*, *Fr.*; pileus fleshy, subcoriaceous, thin, or-

bicular, umbilicate, dirty-white, adorned with innate black scales; stem slender, squamulose, with a decided veil; gills attenuato-decurrent, very narrow, white, tinged with yellow.—*Sow. t.* 68.

On old stumps. Rare. King's Cliffe, on an oak-stem. Smell strong, acrid, like that of some *Lactarii*. Gills forming little villous pores above the filmy ring.

2. *L. Dunalii*, *Fr.*; small; pileus fleshy-coriaceous, thin, umbilicate, often excentric, pallid, clothed with adpressed spot-like scales; stem short, rough towards the base with little black scales; gills decurrent, crowded, pallid. (Plate 15, fig. 2.)

On ash-trees. Rare. Dorsetshire. Smaller than the last, and harder. Perhaps merely a variety. The character given by Fries does not accord with De Candolle's description, still less with Bull. t. 36. It is perhaps too near *L. tigrinus*. Odour subacid, farinaceous.

3. *L. lepideus*, *Fr.*; pileus fleshy, compact, tough, convex, then depressed, unequal, pallid-ochraceous, broken up into darker spot-like scales; stem stout, rooting, tomentoso-squamose; gills sinuate, decurrent, broad, torn, transversely striate, dirty-white.—*Sow. t.* 382.

On stumps of firs. Rare. Pileus 2-4 inches across. Often producing stems without pilei, and variously branched.

4. *L. adhærens*, *Fr.*; pileus rather fleshy, tough, irregular, lacunose, subpulverulent, dingy, pallid, glutinoso-laccate, as well as the somewhat hollow, rooting stem; gills decurrent, forming lines on the stem, very thin, torn, white.—*With.* iv. p. 160.

In pine-woods. The citation of Withering is doubtful, as he says nothing as to the substance on which his plant grows, though his description corresponds.

5. *L. cochleatus*, *Fr.*; annual, tough, flaccid; pileus fleshy, but tough, irregular, more or less lobed or twisted, rufous, turning pallid, as well as the solid, firm, sulcate stem; gills crowded, serrated, pinkish-white. (Plate 19, fig. 4.)

On trunks of trees, and on the ground. Rare, but found occasionally in most parts of England. Stem often divided, so as to produce many spurious pilei.

6. *L. vulpinus*, *Fr.*; sessile, imbricated; pilei fleshy, tough, concbate, connate behind, longitudinally rough with rigid points, tan-coloured; margin incurved, entire; gills torn, white.—*Sow. t.* 361.

On stumps of trees. Rare. On an elm-stump, Margate. Pileus very rough. Spores white.

7. *L. flabelliformis*, *Fr.*; subsessile; pileus thin, tough, reniform, plane, smooth, fawn-coloured; margin crenato-fimbriate; gills broad, torn, pallid.—*Bolt. t.* 157.

On stumps. Rare. I have never seen this species. Perhaps Bolton's plant may be only *Agaricus salignus*.

#### 14. PANUS, *Fr.*

Pileus fleshy, but tough, at length drying up. Gills tough. Edge acute, entire. Hymenophorum homogeneous with the stem.

1. *P. torulosus*, *Fr.*; pileus fleshy, then tough, coriaceous, funnel-shaped, flattened, sometimes dimidiate, even, pale-ochre, frequently shaded with pink; stem short, oblique, clothed with grey down; gills decurrent, rather distant, distinct behind, ruddy, then tan-coloured.—*Batsch, f.* 33; *Bolt. t.* 146.

On old stumps of various trees. Not uncommon. Very variable in point of colour, sometimes quite as bright as in

Batsch's figure, sometimes shaded very slightly, if at all, with pink.

2. *P. conchatus*, *Fr.*; pileus fleshy, but tough, thin, unequal, excentric and dimidiate, cinnamon, then turning pale, at length squamulose; stem short, unequal, pubescent at the base; gills decurrent, forming lines on the stem, somewhat branched, pinkish-white, then ochraceous.—*Bull. t.* 298, 517 *O, P.*

On trunks of trees. Rare. Margate, etc. Not always so much coloured, or so much inclined to be scaly, as is intimated by the specific character, or by Bulliard's plate. Always, however, easily known, by its conchate form and tougher substance, from similar species of the genus *Agaricus*. *A. inconstans*, *P.*, is merely a form of this species.

3. *P. stypticus*, *Fr.*; pileus kidney-shaped, coriaceous, cinnamon, turning pale; cuticle breaking up into mealy scales; stem short, lateral, dilated upwards; gills determinate, thin, crowded, connected by veins, cinnamon.—*Sow. t.* 109.

On stumps, dead trees, etc. Extremely common.

### 15. XEROTUS, *Fr.*

Hymenophorum confluent with the stem. Gills tough or coriaceous, dichotomous. Edge obtuse, entire.

1. *X. degener*, *Fr.*; pileus coriaco-membranaceous, plano-depressed, flocculose, hygrophanous, striate when moist; stem slender, solid, velvety; gills fold-like, branched, very distant, pale.—*Sow. t.* 210.

In peat-mosses. I am not acquainted with this plant.

16. SCHIZOPHYLLUM, *Fr.*

Gills coriaceous, split longitudinally, with the two divisions revolute, or spreading.

1. *S. commune*, *Fr.*; pileus adnate behind, simple, and lobed; gills grey, then brownish-purple, the divided surface villous, the edge revolute.—*Sow. t.* 183.

On dead wood, mostly such as has been imported. I have seen this beautiful plant in profusion on foreign wood, but I have never gathered truly British specimens, which are extremely rare.

17. LENZITES, *Fr.*

Corky or coriaceous. Gills firm, often anastomosing, and forming spurious pores. Edge entire.

1. *L. betulina*, *Fr.*; pileus between corky and coriaceous, firm, somewhat zoned, tomentose, turning pale; margin of the same colour; gills straight, somewhat branched, anastomosing, pallid. (Plate 15, fig. 3.)

On stumps, old rails, etc. Very common. Varying greatly in colour, in the degree of hardness, and in the anastomosing of the gills. Often quite resupinate, and then very deceptive.

2. *L. flaccida*, *Fr.*; pileus thin, coriaceous, flaccid, unequal, zoned, hairy, turning pale; margin of the same colour; gills broad, crowded, unequal, and branched, white, then pallid.—*Bull. t.* 394; *Bolt. t.* 158.

On stumps. Not uncommon. Running by almost imperceptible gradations into the last.

3. *L. sepiaria*, *Fr.*; pileus hard, coriaceous, zoned, strigoso-tomentose, rough, bright brown; margin and the thickish branched anastomosing gills tawny.—*Sow. t.* 418.

On fir-wood, mostly imported. Occurring sometimes in great quantities on fir-poles, on railway platforms, etc.

4. *L. abietina*, *Fr.*; pileus thin, coriaceous, effuso-reflexed, umber, clothed with umber-coloured down, at length smooth and whitish; gills simple, decurrent, unequal, brownish, with a glaucous bloom.—*Bull. t.* 442. *f.* 2.

On deals. Glasgow, *Klotzsch.* Very distinct from the last. Not at all tawny.

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## ORDER 2. POLYPOREI.

Hymenium lining the cavity of tubes or pores, which are sometimes broken up into teeth or concentric plates.

### 18. BOLETUS, *Fr.*

Hymenophorum quite distinct from the hymenium. Trama obsolete. Hymenium lining the cavity of tubes separable from one another and from the hymenophorum.

#### 1. *Spores ochraceous.*

\* *Pileus covered with a viscid pellicle; stem solid, neither reticulated nor bulbous.*

1. *B. luteus*, *L.*; pileus gibbous, then pulvinate, smeared with a brown evanescent gluten; stem dirty-yellow, equal, firm, dirty-white, rough with dots above the broad, membranaceous, whitish-brown ring; tubes adnate, minute, simple, yellow.—*Schæff. t.* 114; *Kromb. t.* 33.

In fir-woods. Fries says that this has been found once only in Great Britain, but it is our commonest species.

2. *B. elegans*, *Schum.*; pileus convexo-plane, viscid, golden-

yellow, and slightly ferruginous; stem firm, unequal, golden-yellow, at length rufous, dotted above the fugacious, white, then yellowish ring; pores decurrent, shining, minute, simple, golden-sulphur.—*Grev. t.* 183; *Kromb. t.* 34. *f.* 1-10; *Huss. ii. t.* 12.

In mixed woods. Far less common, and more beautifully coloured than the last.

3. *B. flavus*, *With.*; firm; pileus clothed with yellow evanescent gluten; stem yellow, then brown, cribose at the tip with the decurrent tubes, which are rather large, angular, and yellow.—*Sow. t.* 265.

In woods. Common. Requires to be carefully distinguished from *B. luteus*.

4. *B. laricinus*, *B.*; pileus dirty-white, with livid stains, covered at first with dirty-yellow or brownish evanescent slime, subsquamose; stem cribose above the ring, scrobiculate below, dirty-white; tubes adnate, subdecurrent, compound, at first nearly white.—*Huss. i. t.* 25.

Amongst larch-trees. Common. Flesh white, very slightly tinged with yellow.

5. *B. granulatus*, *L.*; pileus convex, expanded, glutinous, brown-ferruginous, and when the gluten vanishes yellowish; stem without any ring, yellowish, punctato-granulose above; tubes adnate, short, simple, yellow, orifice granulated.—*Sow. t.* 420.

In grass, amongst firs. Not common. Dorsetshire, etc. Often densely gregarious. Orifices of tubes at first dripping with a milky fluid. Spores ochraceo-ferruginous.

6. *B. bovinus*, *L.*; pileus nearly plane, smooth, viscid, reddish-grey; stem equal, even, self-coloured; tubes subdecurrent, angular, compound, greyish-yellow, then ferruginous.—*Kromb. t.* 75. *f.* 1-6; *Huss. i. t.* 34.

Heathy fir-woods. Dorsetshire, etc. Gregarious. Pileus often tinged with purple. Spores nearly yellow. Stem of the same colour as the pileus, but streaked with watery lines.

7. *B. badius*, *Fr.*; pileus soft, pulvinate, viscid, bay-tawny; stem solid, nearly equal, even, paler, pruinose with brown meal; flesh turning partially blue; tubes adnate or sinuato-depressed, rather large, angular, dingy-yellow, white, then green.—*Kromb. t. 36. f. 15.*

In pine-woods. Rare. Birmingham, *Mr. H. Matthews*. Pileus viscid in wet, shining in dry weather.

8. *B. sanguineus*, *With.*; pileus convexo-plane, even, smooth, viscid, blood-red; stem equal, even, variegated with yellow, and blood-red; tubes adnate, broad, unequal, yellow-orange.—*With. iv. p. 319; Sow. t. 225.*

In woods. Rare. I have never found this species. Withering says nothing about the viscid pileus.

9. *B. piperatus*, *Bull.*; pileus convexo-plane, smooth, slightly viscid, yellow, inclining to reddish-grey; stem slender, even, brittle, yellow within and at the base; tubes sub-decurrent, large, angular, ferruginous.—*Sow. t. 34.*

In woods. Not very common. Smaller than any of the foregoing. Taste hot and peppery.

\*\* *Pileus more or less tomentose.*

10. *B. parasiticus*, *Bull.*; parasitic; pileus hemispherical, slightly silky, dirty-yellow, as well as the incurved, rigid stem; tubes decurrent, middle-sized, rounded, compound, golden-yellow. (Plate 15, fig. 4.)

On species of *Elaphomyces*. Rare. Clifton, *C. E. B.* Abundant in Kew Gardens, 1859. Pileus often cracked. Flesh yellow, becoming ruddy when dry. Not at all viscid.

11. *B. variegatus*, *Fr.*; pileus convexo-plane, obtuse,

moist, tawny-yellow, sprinkled with superficial fasciculatopilose scales; margin acute, at first flocculose; stem ringless, equal, even; tubes adnate, unequal, minute, brownish-cinnamon, then pallid.—*Kromb. t. 34. f. 15-18.*

In pine-woods. Not common. Helensburgh, *Klotzsch*. Dorsetshire. Sometimes nearly smooth.

12. *B. striæpes*, *Sec.*; pileus convex, then plane, soft, silky, olive; cuticle ferruginous within; stem curved, firm, yellow, with brownish-black striae, brownish-rufous at the base; tubes minute, angular, at length green; orifice yellow.

In woods. Rare. Coed Coch. Stem dirty-yellow, dotted under a lens with broad bay lines. Flesh white, red near the cuticle, sparingly changing to blue.

13. *B. chrysenderon*, *Fr.*; pileus convexo-plane, soft, floccoso-squamose, brownish, inclining to brick-red; flesh yellow, red near the cuticle; stem nearly equal, rigid, fibroso-striate, scarlet or yellow; tubes subadnate, rather large, angular, unequal, yellowish-green.—*Bull. t. 490. f. 3; Huss. i. t. 5.*

In meadows, woods, etc. Extremely common.

14. *B. subtomentosus*, *L.*; pileus pulvinate, expanded, soft, dry, villosotomentose, somewhat olive, not red under the cuticle; stem stout, unequal, sulcate, and ribbed minutely dotted and rough, yellow, as well as the broad angular adnate tubes.—*Kromb. t. 37. f. 8-11.*

In woods. Not so common as the last. Abundant at Coed Coch. In the former, when the pileus is cracked, the cracks are red, in this yellow.

\*\*\* *Stem reticulated; tubes adnate or merely depressed, not rounded; orifice of tubes yellow.*

15. *B. calopus*, *Fr.*; pileus globose, then pulvinate, not polished, subtomentose, olive; stem firm, at first conical, then

nearly equal, partially or wholly scarlet, reticulated; tubes minute, adnate, angular, yellow.—*Kromb. t. 37. f. 1-7.*

In mixed woods. King's Cliffe. Extremely beautiful.

16. *B. olivaceus*, *Schæff.*; pileus convex, even, at length smooth, olive-brown; margin at first inflexed; stem firm, clavato-bulbous, yellowish at the top, blood-coloured below, reticulate and punctate; tubes adnate, short, minute, unequal, brown-olive.—*Schæff. t. 105.*

In woods. Rare. Purton, in the 'Midland Flora.'

17. *B. pachypus*, *Fr.*; pileus pulvinate, dry, subtomentose, brownish, then pallid-tan; stem thick, firm, reticulated, variegated with yellow and red; tubes somewhat elongated, shorter near the stem, almost free, yellow; orifice of the same colour.

In woods. Not common. Scotland, *Klotzsch.* Fleshy, changing partially to blue.

\*\*\*\* *Orifice of tubes red.*

18. *B. Satanus*, *Lenz.*; pileus pulvinate, smooth, slightly viscid, brownish-tan, then nearly white; stem blunt, ovato-ventricose, reticulated above, blood-red; tubes free, minute, yellow; orifice from the beginning blood-red.—*Lenz. f. 33; Huss. i. t. 7.*

In woods. Not common. King's Cliffe, 1848, 1858. A large, poisonous species.

19. *B. luridus*, *Fr.*; pileus pulvinate, tomentose, umber-olive, then somewhat viscid, dingy; stem stout, vermilion, either netted or dotted; tubes free, round, yellow, then green; mouth vermilion, then orange. (Plate 15, fig. 5.)

In woods and woodland pastures. Very common. Poisonous. Changes rapidly to blue when cut or bruised.

20. *B. erythropus*, *P.*; pileus tomentose, almost velvety,

tawny; stem elongated, dotted with red, not reticulate, red within at the base and partially elsewhere; tubes free.

In woods. King's Cliffe, etc. Flesh yellow here and there, blue when cut, but partially red. Far more beautiful than the last.

21. *B. purpureus*, *Fr.*; pileus pulvinate, somewhat velvety, opaque, dry, purple-red; stem stout, variegated with purple veins or dots; tubes minute, nearly free, yellow, changing to green, orifice purple-orange.—*Kromb. t. 37. f. 12-15.*

In woods. Rare. King's Cliffe, 1845. Extremely beautiful. All the above four species are found occasionally in the same wood, which consists principally of *Tilia parvifolia*.

\*\*\*\*\* *Esulent; tubes rounded behind; mouth of the same colour.*

22. *B. edulis*, *Bull.*; pileus pulvinate, smooth, moist, brownish; stem stout, reticulated, pale brown; tubes half-free, elongated, minute, at first white, then yellow and green. (Plate 15, fig. 6.)—*Huss. i. t. 81.*

In woods. More frequent in the south of England than the north. Esulent. The large size, truly netted stem, smooth pileus, and agreeable nutty flavour, easily distinguish this species.

23. *B. impolitus*, *Fr.*; pileus pulvinate, dilated, flocculose, dingy, pallid, at length granuloso-rivulose; margin obtuse; stem short, stout, compact, even, pallid; tubes nearly free, very long, yellow, not reticulated.—*Kromb. t. 74. f. 10, 11.*

On woodsides, etc. Not common. Under oaks. King's Cliffe. Grows to a large size. Flesh more or less changing to blue when cut. Fries speaks of his plant as sweet to the taste; mine has the taste of sprouting walnuts, and is exactly the plant of Krombholz.

24. *B. æstivalis*, *Fr.*; pileus pulvinate, silky, soft, at length

rivulose, opaque, minutely granulated and silky, pallid-tan; stem stout, firm, somewhat conical, even, pallid, white, as well as the minute, elongated, equal tubes.—*Huss.* ii. t. 25.

In woodland pastures. King's Cliffe. Kent, *Mrs. Hussey*. A large species. The flesh, I believe, never becomes blue.

### 2. *Spores subferruginous.*

25. *B. viscidus*, *L.*; pileus pulvinate, soft, smooth, viscid, dirty-yellow; veil subannulate, torn, white, appendiculate; stem reticulate above; tubes wide, adnate, unequal, livid.

In woods. Rare. Bristol, *Dr. Stephens*.

26. *B. versipellis*, *Fr.*; pileus pulvinate, dry, at first closely tomentose, then scaly, and smooth in the interstices; veil membranaceous, annular, inflexed, appendiculate; stem solid, attenuated upwards, rugoso-squamose; tubes free, plane, minute, dirty-white.—*Sow.* t. 110.

In woods. Not uncommon. Pileus of a beautiful orange. Too nearly, perhaps, allied to the next.

27. *B. scaber*, *Fr.*; pileus pulvinate, smooth, viscid when moist, at length rugulose or rivulose; margin veiled; stem solid, attenuated upwards, rough with fibrous scales; tubes free, convex, round, minute, white, then dingy.—*Vitt.* t. 28. *Huss.* i. t. 57.

In woods. Extremely common. Generally smaller than the last.

### 3. *Spores rose-coloured.*

28. *B. alutarius*, *Fr.*; pileus pulvinate, expanded, soft, velvety, then smooth, brownish-tan; flesh white; stem solid, bulbous, nearly even, white, together with the pitted apex and round plane short tubes, which are depressed round the stem, and become brown when bruised.—*Kromb.* t. 74. f. 8, 9.

In woodland pastures. Rare. Kent, *Mrs. Hussey*.

29. *B. felleus*, *Bull.*; pileus soft, pulvinate, smooth, even, brown, inclining to reddish-grey; stem solid above, attenuated, reticulated; tubes adnate, convex, elongated, angular, flesh-coloured, as well as the substance of the pileus when broken.—*Bull. t.* 379.

In woods. Rare. King's Cliffe. Taste bitter.

#### 4. *Spores white.*

30. *B. cyanescens*, *Bull.*; pileus convexo-expanded, closely tomentose or floccoso-squamose, opaque, tan, becoming brownish; flesh compact, white, dark blue when broken; stem stuffed, then hollow, ventricose, villosopruinose, of the same colour, constricted above, even, white; tubes free, minute, round, white, then yellow.—*Bull. t.* 369.

In woods. Not found since the time of Sibthorpe.

31. *B. castaneus*, *Bull.*; pileus convex, expanded or depressed, opaque, velvety, cinnamon as well as the stem, which is stuffed, then hollow, attenuated from the somewhat bulbous base; flesh white, unchangeable; tubes free, short, round, white, then dull-yellow.—*Bull. t.* 328; *Huss. ii. t.* 17.

In woods. Rare. A small species.

### 19. STROBILOMYCES, *B.*

Hymenophorum quite distinct from the hymenium. Pileus fleshy, at length tough. Spores globose or broadly elliptic, minutely rough.

1. *Strobilomyces strobilaceus*, *B.*; blackish-umber; pileus pulvinate, rough with thick floccose scales; stem equal, veiled, sulcate above; tubes adnate, white, angular, whitish-brown.—*Dicks. Cr. i. t.* 3. *f.* 2.

In fir-woods. Very rare. Bullstrode, *Lightfoot.* Spores very dark.

20. POLYPORUS, *Fr.*

Hymenophorum descending into the trama of the pores, which are not easily, if at all, separable, and changed with them into a distinct substance.

1. *Stem central; pileus entire.*

1. *P. brumalis*, *Fr.*; pileus fleshy, then coriaceous, somewhat umbilicate, zoneless, in the first season dingy-villous, in the second squamulose, becoming smooth, pallid; stem slender, hirsuto-squamulose, pallid; pores oblong and angular, slender, acute, denticulate, white.—*Rost. t. 8.*

On dead trunks and branches. Rare. Scotland. Portbury, near Bristol, *C. E. B.*

2. *P. fuseidulus*, *Fr.*; pileus fleshy, then tough, subcoriaceous, convexo-plane, zoneless, even, brown, tinged with yellow; stem rather slender, equal, smooth, attenuated, pallid; pores adnate, angular, somewhat rounded, obtuse, quite entire, yellowish.—*Bolt. t. 170.*

Amongst chips, etc. Extremely rare. Darlington, *Mr. Robson*. Pileus about 2 inches across.

3. *P. leptcephalus*, *Fr.*; pileus tough, coriaceous, convexo-plane, thin, smooth, zoneless, even, pallid, then fawn-coloured; stem short, smooth, pallid; pores minute, rounded, obtuse, adnate, whitish.—*Jacq. Misc. i. t. 12.*

On trunks of trees. Rare. Scotland, *Klotzsch*. Also found by *Mr. Dickson*.

4. *P. lentus*, *B.*; pileus fleshy, but tough, umbilicate, minutely scaly, especially at first; stem hispid, furfuraceous, rather slender, incurved, central or excentric; pores irregular, decurrent, white. (Plate 16, fig. 1.)

On old stems of *Ulex*. Northamptonshire and Nottinghamshire. Not uncommon. Allied to *P. squamosus*.

5. *P. Schweinitzii*, *Fr.*; pileus thick, spongy, then corky, strigoso-tomentose, rough, bright-brown; stem thick, very short or obsolete, ferruginous; pores large, often torn and irregular, sulphur-green.—*Sv. Bot. t. 720.*

Amongst the roots of pines. Very rare. Dorsetshire, *C. E. B.* The first specimens found, which exactly agree with *P. Schweinitzii*, var. *dimidiatus*, were referred, because of the total absence of a stem, to *P. Herbergii*, Rostk.

6. *P. rufescens*, *Fr.*; flesh-coloured; pileus spongy, then corky, soft, unequal, hairy; stem short, irregular; pores large, sinuated and torn, white, tinged with flesh-colour.—*Sow. 190.*

On the ground, about stumps. Not uncommon. Sometimes very beautiful. Stem often lateral, and in densely imbricated specimens sometimes obsolete.

7. *P. perennis*, *Fr.*; cinnamon, then bright-brown; pileus coriaceous, then plano-infundibuliform, velvety, at length smooth, zoned; stem firm, thickened below, velvety; pores minute, angular, acute, at first veiled with a white substance, then naked and torn.—*Sow. t. 192; Huss. i. t. 51.*

On the ground and on stumps, mostly in subalpine countries. Not uncommon.

## 2. *Stem lateral.*

8. *P. squamosus*, *Fr.*; pileus fleshy, but tough, flabelliform, expanded, pallid, variegated with broad, adpressed, spot-like, centrifugal scales; stem excentric and lateral, blunt, reticulated above, black at the base; pores thin, irregular, at length broad, angular, and torn, pallid.—*Grev. t. 207. Huss. i. t. 33.*

On trunks of trees, especially Ash. Extremely common.

9. *P. Rostkovii*, *Fr.*; pileus fleshy, but tough, dimidiate, somewhat infundibuliform, smooth, even, dingy; stem long, excentric, reticulated, abruptly black, thickened at the base;

pores decurrent, broad, pentagonal, acute, toothed, white, then dirty-yellowish.—*Rostk. t.* 17.

On old stumps. Rare. Apethorpe, Northamptonshire. Much thinner than the last.

10. *P. picipes*, *Fr.*; pileus fleshy, but coriaceous, rigid, tough, even, smooth, depressed behind and in the centre; stem excentric and lateral, equal, firm, at first velvety, then naked, dotted black up to the round, small, tender, white, then reddish-grey tubes.—*Grev. t.* 202.

On trunks of trees. Not uncommon. Pileus ochraceous or rufous.

11. *P. varius*, *Fr.*; pileus fleshy, but tough, thin, soon woody, smooth, somewhat virgate, irregular, depressed behind or in the centre; stem excentric and lateral, even, smooth, becoming gradually cinereous downwards; pores decurrent, minute, short, round, unequal, whitish, then watery-cinnamon.—*Bolt. t.* 168.

On trunks of trees. Not uncommon.

12. *P. elegans*, *Fr.*; pileus equally fleshy, soon hard and woody, flattened out, even, smooth, self-coloured; stem excentric or lateral, even, smooth, pallid, from the first abruptly black at the base, rooting; pores plane, minute, nearly round, whitish-yellow, becoming pallid.—*Bolt. t.* 83.

On trunks of trees. Not uncommon. The limits of these three species are, however, very difficult to seize. *P. nummularius*, whose pileus scarcely exceeds an inch in diameter, and is occasionally almost velvety when young, though quite smooth when old, has, perhaps, quite as great pretensions to be separated as a species.

13. *P. quercinus*, *Fr.*; pileus soft, corky, tongue-shaped, very thick, convexo-plane, even, at first flocculoso-granulated, tan-coloured, becoming pallid, narrowed behind into a thick,

horizontal stem; pores short, minute, dirty-white.—*Huss. i. t. 52.*

On old oaks, with *Fistulina hepatica*. Rare. Apethorpe, Norths. Kent, *Mrs. Hussey*. A most distinct species.

14. *P. lucidus*, *Fr.*; pileus corky, flabelliform, sulcato-rugose, yellow, then sanguineous, chestnut, varnished and shining, as well as the lateral stem; pores determinate, long, minute, white, then cinnamon. (Plate 16, fig. 2.)

On the ground, about old stumps. Not uncommon. Extremely beautiful when well grown. Very common in the tropics. Stem very variable in length and position.

3. *Pilei numerous, springing from a common trunk, and arising from the subdivision of the primary pileus.*

15. *P. intybaceus*, *Fr.*; very much branched, fleshy, rather brittle; pileoli very numerous, dimidiate, stretched out, sinuate, at length spatulate and nearly even, greyish-brown; stems united into a short trunk; pores firm, obtuse, white, becoming brown.—*Huss. i. t. 6.*

On trunks of trees. Very rare. Inverary, *Rev. C. Smith*. Kent, *Mrs. Hussey, etc.* Esculent.

16. *P. cristatus*, *Fr.*; branched, fleshy, firm, brittle; pileoli entire and dimidiate, imbricated, depressed, between villous and pulverulent, then rimoso-squamose, brown, tinged with green; stems connate, irregular, white; pores minute, angular and torn, dirty-white.—*Rostk. t. 16.*

In beech-woods. Very rare, *Dickson*.

17. *P. giganteus*, *Fr.*; imbricated, fleshy, but tough, then subcoriaceous; pilei dimidiate, very broad, somewhat zoned, rivulose, bright-brown, depressed behind; stems branched, connate from a common tuber; pores minute, nearly round, pallid, at length torn.—*Huss. i. t. 82.*

On trunks of trees, etc. Rare. Kew. Coed Coch, etc. Surface of the pileus rough with little granules or scales. Extremely handsome.

18. *P. sulfureus*, *Fr.*; imbricated, of a cheesy consistence, soon growing pale and cracking; pilei very broad, undulated, nearly smooth, ruddy yellow; pores minute, plane, sulphur-coloured, at length torn. (Plate 16, fig. 3.)—*Huss. i. t.* 46.

On trunks of various trees. Common. Stem generally obsolete. When dry, often covered with little crystals.

19. *P. alligatus*, *Fr.*; cæspitose, of a fibrous, cheesy consistence, rigid, but brittle; pilei imbricated, unequal, zoneless, villous, tan-coloured, inclining to red; pores minute, soft, white, easily obliterated by flocci.—*Sow. t.* 422.

At the base of trunks. Rare. I am not convinced that Fries and Sowerby have the same species in view.

20. *P. heteroclitus*, *Fr.*; cæspitose, coriaceous; pilei sessile, expanded on all sides from a common radical tubercle, lobed, villous, zoneless, orange; pores irregular and elongated, dull golden-yellow.—*Bolt. t.* 164.

On the ground, under oaks. I am not acquainted with this species.

21. *P. salignus*, *Fr.*; imbricato-cæspitose, coriaceous, but soft; pilei dimidiate, dilated, kidney-shaped, dirty-white, clothed with depressed down, swollen, sulcato-depressed about the somewhat lobed margin; pores thin, crowded, elongated, flexuous, intricate, white.—*Bolt. t.* 78.

On willows. Not uncommon. Edinburgh, *Dr. Greville*, etc.

#### 4. *Stemless.*

\* ANODERMEI.—*Pileus at first juicy. Cuticle none.*

22. *P. chioneus*, *Fr.*; white; pileus fleshy, soft, zoneless, at length even and smooth, somewhat stretched out behind;

margin acute, inflexed; pores short, round, equal, quite entire.

On trunks. Scotland, *A. Jerdon*. Bath, *C. E. B.* Thin, about an inch across.

23. *P. fragilis*, *Fr.*; dirty-white, spotted with brown when touched; pileus fleshy, fibrous, brittle, plano-depressed or versiform, rough with fibres, convex below; pores thin, elongato-flexuous, intricate.

On fir. Cornwall, *Mr. Ralfs*.

24. *P. cæsius*, *Fr.*; white, here and there tinged with blue; pileus fleshy, soft, tough, unequal, silky; pores small, unequal, elongato-flexuous, torn and toothed.—*Sow. t.* 226.

On fallen sticks, etc. Not uncommon. About an inch across, sometimes resupinate. Spores green.

25. *P. destructor*, *Fr.*; pileus fleshy, watery, brittle, effuso-reflexed, wrinkled, dirty-white, tinged with brown, zoned within; pores long, rounded, toothed and torn, dirty-white.

On larch and Scotch fir. Scotland, *Mrs. Wynne*. Northamptonshire, in several localities. Sometimes almost resupinate or effuse, with scarcely any free margin.

26. *P. nidulans*, *Fr.*; pileus fleshy, but tough, very soft, somewhat pulvinate, villous, then nearly even, zoneless, reddish-grey, of the same colour within; pores long, middle-sized, unequal, angular, tawny, inclining to tile-red.

On fallen sticks. Not common. Sherwood Forest, on mountain ash. A resupinate form was sent from Scotland by *Dr. Bauchop*.

27. *P. rutilans*, *Fr.*; pileus fleshy, but tough, thin, soft, at first villous, then smooth, zoneless, tawny-cinnamon, turning pale, of the same colour within; pores short, minute, thin, equal, acute, cinnamon.—*Pers. Ic. et Descr. t.* 6. *f.* 4.

On fallen branches. Not common. Wynnstay. Denbighshire. When fresh, has a sweet scent, like that of anise.

28. *P. fumosus*, *Fr.*; pileus fleshy, then rather corky, firm, zoneless, silky, at length smooth, undulated, dingy, pale umber, dilated and adnate behind; fibrous within and zoned; pores short, round, minute, dirty-white, darker when bruised.

On stumps of trees. Very common. Smell oppressive.

29. *P. adustus*, *Fr.*; pileus fleshy, tough, firm, thin, villous, cinereous, pallid; margin straight, at length black, effuso-reflexed behind; pores short, minute, round, obtuse, dirty-white and pruinose, then cinereous-brown.—*Sow. t.* 231.

On stumps of trees. Not uncommon. *P. carpineus* is a thin, yellowish variety.

30. *P. crispus*, *Fr.*; pileus fleshy, but tough, coriaceous, rugose, cinereous, effuso-reflexed behind; margin thin, crisped, at length black; pores rather large, unequal, at length labyrinthiform, silvery-cinereous.—*Batsch, f.* 227.

On stumps. Less common than the last. Very nearly allied to it.

31. *P. adiposus*, *B. and Br.*; white, here and there acquiring a foxy tinge; pileus soft, waxy, shortly reflexed, obscurely tomentose; hymenium rather thick; pores small; edge obtuse.

On the ground. Warwickshire, *Rev. A. Bloxam*. Coed Coeh. Turns brownish in drying. Pores not stratose.

32. *P. amorphus*, *Fr.*; pileus fleshy, but tough, thin, generally effuso-reflexed; pores minute, unequal, golden-yellow, at first dusted with white.—*Sow. t.* 423.

On the ground, amongst pine-leaves. A most beautiful, but small species. Sowerby's plant is not so bright in colour as the more usual form.

33. *P. hispidus*, *Fr.*; pileus compact, fleshy, but spongy, dimidiate, pulvinate, hispid, ferruginous, fibrous within, the fibres diverging; pores minute, rounded, inclined to sepa-

rate, fimbriated, paler than the pileus.—*Sow. t.* 345. *Huss. i. t.* 29, 31.

On trunks of living trees. Very common. Very dark when old. Spores yellow.

34. *P. spumeus*, *Fr.*; dirty-white; pileus fleshy, but spongy, compact, pulvinate or convexo-plane, wrinkled, hispid, flesh white; pores seceding, minute, round, acute, entire. (Plate 16, fig. 4.)—*Sow. t.* 211.

On trunks of various trees. Not common. Very variable in form. Slightly zoned within.

\*\* PLACODERMEI.—*Pileus indurated, clothed with a more or less decided crust.*

35. *P. dryadeus*, *Fr.*; pileus rather soft, spongy, then corky, thick, pulvinate, subferruginous, turning brown; cuticle thin, soft, pitted, then even and smooth; flesh fibrous, somewhat zoned, ferruginous as well as the very long, slender, round, soft pores; orifice at first paler.—*Bull. t.* 458. *Huss. i. t.* 21.

At the foot of old oaks. Not uncommon. Often studded with drops of moisture. Spores white. Cuticle not so manifest as in several allied species.

36. *P. betulinus*, *Fr.*; pileus fleshy, then corky, unguulate, obtuse, smooth, zoneless, covered with a thin, even, brownish, minutely scabrous cuticle; vertex oblique, forming a sort of umbo; pores short, minute, round, unequal, white, at length seceding.—*Grev. t.* 246.

On birch-trees. Not uncommon. Makes excellent razor-strops.

37. *P. pallescens*, *Fr.*; pileus fleshy and spongy, at length corky, thin, zoneless, even, smooth, yellowish; margin acute, of the same colour; pores short, minute, roundish, white, at length yellowish.—*Sow. t.* 230.

On old stumps. Not common. A small species, resembling some states of *P. fumosus*.

38. *P. vegetus*, *Fr.*; pileus broad, dilated, smooth, opaque-brown; annual zone broad, concentrically sulcate; substance floccose, loose, very thin; cuticle of the second season thick, separable; pores minute, seceding, umber, the stratum of each year being separated by a floccose mass.

On lime-trees. Scotland, *Klotzsch*.

39. *P. applanatus*, *Fr.*; pileus flattened, tuberculate, obsoletely zoned, pulverulent or smooth, cinnamon, become whitish, clothed with a rigid, crustaceous, and at length brittle skin, very soft within, loosely floccose; margin swollen, white, then cinnamon; pores very small, subferruginous; orifice dirty-white, brownish when bruised.

On trunks of trees. Scotland, *Klotzsch*. Bristol, Oxford, etc. A large plant, with abundant ferruginous pores, and very soft, often pale, silky flesh.

40. *P. fomentarius*, *Fr.*; pileus unguulate, dilated, thick, remotely zoned concentrically, smooth, opaque, dingy, then whitish, soft and floccose within, of a tawny-ferruginous; cuticle thick, very hard, persistent; margin and very long minute pores distinctly stratose, at first pruinose, then ferruginous.—*Sow. t.* 133.

On trunks of trees. Common. Spores dark.

41. *P. nigricans*, *Fr.*; pileus pulvinate, very thick, closely and concentrically sulcate, smooth, shining, black; crust very hard, laccate, persistent; substance ferruginous, extremely hard; margin very obtuse, ferruginous, as well as the very small, plane, confluenti-stratose, naked pores.

On birch-trees. Scotland, *Klotzsch*. Not found, I believe, by any one else. A neater and more shining plant than the following.

42. *P. igniarius*, *Fr.*; pileus even, clothed with a thin floeculent coat, which soon becomes white, at length unguilate, ferruginous, changing to brownish-black, opaque; skin close; surface uneven, very hard, as well as the zoned ferruginous flesh; margin rounded; pores very minute, convex, stratose, cinnamon, at first whitish.—*Sow. t.* 132.

On willows, poplars, plums, etc. Extremely common. Mycelium and spores white, by which latter circumstance, as well as by other characters, it is clearly distinguished from *P. foementarius*. Often resupinate.

43. *P. Ribis*, *Fr.*; pileus corky, coriaceous, rather soft, flattened, velvety, nearly even, ferruginous, then umber, tawny within, as well as the sharp margin, and short, small, naked pores.

At the base of currant- and gooseberry-trees. Very common, lasting several years.

44. *P. conchatus*, *Fr.*; pileus corky, hard, thin, effused, subconchiform, reflexed, concentrically sulcate, tomentose, bright brown; margin acute; pores short, small, cinnamon.

On trunks of various trees. Not uncommon.

45. *P. salicinus*, *Fr.*; pileus woody, very hard, undulated, smooth, in great part resupinate; margin short, obtuse, patent, cinnamon, then brown; pores very small, round, ferruginous, cinnamon.

On willows. Common. Very difficult to distinguish from the last, which also grows on willows. Both are frequently resupinate. Crust black.

46. *P. ulmarius*, *Fr.*; pileus corky, hard, undulated and tuberculate, crustaceous or pilcate, smooth, at first white without and within; pores decurrent, minute, round, stratose, yellowish salmon-coloured. (Plate 16, fig. 5: plant of the second season.)—*Huss. i. t.* 64.

In old elm-trunks. Common. Very variable as regards the colour of the pileus when old. Pores always coloured.

47. *P. fraxineus*, *Fr.*; pileus corky, hard, smooth, flattened, white, then rubiginous and brown, at first even, then concentrically sulcato-plicate, pallid within; pores minute, short, rufous, at first clothed with white sebaceous villosity, as is also the margin.

At the base of ash-trees. Not uncommon. I have seen this species a yard in diameter, and marked with concentric furrows, indicating the periods of growth.

48. *P. cytisinus*, *B.*; large, imbricated; pileus coarsely tuberculated, hard, woody; margin subacute; substance nearly white, as well as the minute pores.—*Sow. t.* 288.

At the foot of a laburnum. London. Quite smooth, at least when dry. A foot or more across. Allied to the last.

49. *P. variegatus*, *Fr.*; pileus corky, hard, smooth, flattened, even, zoneless, shining, variegated with orange and bay, pallid within; pores round, minute, short, unequal and torn, yellowish.—*Sow. t.* 368.

On trunks of trees. I am not acquainted with this species.

50. *P. cervinus*, *P.*; effused, very broad; pileus somewhat reflexed, zoned, cinereous-umber, clothed with spongy down; pores large, various, greyish; dissepiments rigid.—*Myc. Eur.* ii. *p.* 87.

On fallen branches of beech. Not uncommon. Oswestry, *Rev. T. Salwey*. King's Cliffe, etc. Not properly fawn-coloured.

51. *P. annosus*, *Fr.*; pileus woody, convex, then flattened, rough with tubercles, in the first season brown, silky, in the second and when old covered with a rigid, smooth, black crust; substance white; margin obtuse, whitish, as well as the middle-sized, obtuse pores.

On stumps of larch, etc. Very common in some districts. Extremely variable. Often resupinate; and then *P. medullaris* of some authors. *P. scoticus* and *P. subpileatus*, Kl., are both forms of this species.

52. *P. connatus*, *Fr.*; pilei corky, hard, effuso-reflexed, imbricated, somewhat zoned, confluent, velvety, white without and within; pores minute, roundish, white.

On old trunks of crab-trees, etc., running up them for one or two feet. Often amongst moss. Not uncommon. The pilei are sometimes almost obliterated by the moss.

\*\*\* INODERMEI.—*Pileus at first dry, clothed with a thin fibrous cuticle.*

53. *P. radiatus*, *Fr.*; pileus corky, coriaceous, rigid, radiato-rugose, at first velvety, tawny, then smooth, ferruginous-brown; margin patent, waved; pores minute, pallid, with a silvery lustre, at length ferruginous.—*Sow. t.* 190.

On hazel-stems, etc. Not very uncommon. Scotland, *A. Jerdon*. It has the colour of some of the *Placodermei*.

54. *P. fibula*, *Fr.*; white; pileus coriaceous, tough, hairy, substrigose, zoneless; margin entire, acute; pores rather small, round, acute, at length pallid.—*Sow. t.* 387. *f.* 8.

On the door of a wine-cellar, *Sowerby*. I am not acquainted with this species.

55. *P. velutinus*, *Fr.*; pileus corky, coriaceous, plane on either side, velvety, slightly zoned, white, at length yellowish; margin acute, attenuated; pores round, minute, then white.

On branches. Not common. Edinburgh, *Dr. Greville*.

56. *P. versicolor*, *Fr.*; pileus thin, coriaceous, rigid, flattened, depressed behind, velvety, shining in parts, variegated with different coloured zones; pores minute, round, acute and torn, white, at length pallid.—*Huss. i. t.* 24.

On stumps, branches, etc. One of the most common species, and as variable as it is common. Some specimens are perfectly white, others yellowish, others cinereous-blue, etc. Some individuals approach near to *P. zonatus*, which has not, I believe, been found in this country. It is a far thicker and coarser plant. Sow. t. 367 is probably a pale form of this.

57. *P. abietinus*, *Fr.*; pileus coriaceous, thin, effuso-reflexed, villous, obsolete zoned, cinereous-white; pores unequal, torn, lilac, at length pale.—*Grev. t.* 221.

On trunks of *Coniferae*. Almost as common as the last in fir-woods, and sometimes very pretty. Extremely variable in form, but always easily recognized.

58. *P. Wynnei*, *B. and Br.*; confluent, various in form; pileus adnate behind, effuso-reflexed, then tan-coloured, marked with silky raised lines; pores small, angular, white.

Running over twigs, grass, etc. Rare. Cheshire. Coed Coch. Pores becoming pallid in drying. This species has somewhat the habit of *P. amorphus*, but is very different in substance.

5. *Resupinate.*

\* *Pores coloured.*

59. *P. contiguus*, *Fr.*; effused, firm, at first obscurely cinnamon; circumference villous or fibrous, then smooth, ferruginous; pores middle-sized, equal, obtuse, entire.

On rotten wood and sticks. Not common. East Bergholt, *Dr. Badham*. *P. cellaris*, *Desm.*, is probably the same species. It has been found at Oswestry by Mr. Salwey.

60. *P. ferruginosus*, *Fr.*; effused, firm, tawny, when old ferruginous, bright brown; circumference barren; pores elongated, roundish, middle-sized, cinnamon.—*Grev. t.* 155.

On gate-posts, fallen sticks, etc. Common. Mycelium

ochraceous. In resupinate forms of *P. igniarius* the mycelium is white.

61. *P. nitidus*, *Fr.*; effused, thin, yellow; circumference paler, formed of the interwoven mycelium; pores minute, roundish, short, saffron-yellow.—*Pers. Obs.* ii. t. 4. f. 1.

On dead wood. Rare. Bristol, *Dr. Stephens*.

62. *P. Armeniacus*, *B.*; suborbicular, confluent, extremely thin; circumference minutely downy; pores at first white, then deep buff.

On the bark of fir-trees. Appin, *Capt. Carmichael*. Pores often confined to the centre.

63. *P. bombycinus*, *Fr.*; effused, membranaceous, of a silky texture, dirty-yellow; circumference byssoid; below velvety, arachnoid; pores large, angular.—*Sow. t.* 387. f. 5.

On dead wood. Not common. Portbury, *C. E. Broome*, Northamptonshire, etc. The pores vary a good deal in size.

64. *P. incarnatus*, *Fr.*; effused, coriaceous, firm, smooth, flesh-coloured; pores rather long, unequal.—*Pers. Myc. Eur.* t. 16. f. 4.

On decaying trunks of fir-trees. Rare. Edinburgh, *Dr. Greville*. Pores of a fine flesh-colour, approaching in some cases to orange.

65. *P. purpureus*, *Fr.*; broadly and widely effused; mycelium mucedinous, flocculose, white, creeping on the surface of the decayed wood; pores short, minute, unequal, obtuse, scattered here and there or conglomerate, purple-lilac.

On a decayed willow. Very rare. Cotterstock, Northamptonshire. *P. undatus*, Eng. Fl., is not the plant of *Pers.*, but probably a state of *P. igniarius*.

\*\* Pores white, or only becoming pallid.

66. *P. cinctus*, *B.*; white, turning pallid, forming little scattered patches, each surrounded by radiating strigose fibres;

pores extremely minute, angular; dissepiments extremely thin; edge ragged.—*Mag. Zool. and Bot.* i. t. 2. f. 3.

On old deal boards. Very rare. King's Cliffe. Some of the patches are barren, and some at length become confluent.

67. *P. medulla-panis*, *Fr.*; effused, determinate, subundulated, firm, smooth, white; circumference naked, immarginate, composed almost entirely of middle-sized, rather long, entire pores.

On decaying wood. Not uncommon if *Sow. t.* 387. f. 7 be the plant of Fries, as it certainly is of Persoon.

68. *P. vitreus*, *Fr.*; effused, subundulated, indeterminate, dirty-white, somewhat hyaline; mycelium thin, separable, matted together into a mass like kid leather; pores very small, round, long, obtuse, entire.

On decayed wood. Rare. West of England, *C. E. B.*

69. *P. obducens*, *Fr.*; effused, incrusting, innate, firm, white, composed entirely of very small, crowded, equal pores, distinctly stratose; annual strata pallid-tan.

On rotten trunks. Not common. Bristol, *C. E. B.* Not to be confounded with resupinate *P. connatus*.

70. *P. vulgaris*, *Fr.*; widely effused, thin, dry, closely adnate, even, white; circumference soon smooth, entirely formed of firm, crowded, nearly equal pores. (Plate 16, fig. 6.)

On dead wood and fallen branches. Not uncommon. Sometimes yellowish.

71. *P. molluscus*, *Fr.*; effused, thin, soft, white; circumference byssoid, composed of radiating fibrils; pores central or collected in patches, small, round, unequal and torn, turning pale.—*Sow. t.* 387. f. 9.

On dead wood. Rare. Known by its radiating, byssoid margin. I have found it, however, abundantly on larch, with the margin sometimes radiating, sometimes abrupt.

72. *P. terrestris*, *Fr.*; effused, arachnoid, byssoid, delicate, fugacious, white; pores central, very small, at length rufous.

On the naked soil, or on rotten wood. Rare. Linlithgowshire, *Dr. Bauchop.*

73. *P. vaporarius*, *Fr.*; effused, innate; mycelium creeping amongst the tissue of the wood, floccose, white; pores large, angular, white, turning pallid, crowded into a close, firm, persistent stratum.

On fallen branches. Everywhere in woods.

74. *P. aneirinus*, *Fr.*; effused, thin, subinnate; circumference byssoid, white; pores large, cellular, waxy, angular, smooth, white, then tawny.

On fallen twigs. Rare. Edinburgh, *Dr. Bauchop.*

75. *P. Stephensii*, *Fr.*; orbicular, white, at length confluent; margin sometimes slightly reflexed, tomentose; pores broad, nearly equal, angular; dissepiments rather thick; edge villous.

On twigs of privet. West of England, *Dr. Stephens, C. E. B.* A very fine species, resembling a resupinate *Hexagonia*. Pores one-twentieth of an inch across.

76. *P. Vaillantii*, *Fr.*; white, thin; mycelium free, forming distinct strings, sometimes joined together by a membrane; pores crowded here and there, short, rather large, thin, unequal.—*Sow. t.* 326.

On dead wood. Very rare. Glasgow, *Klotzsch*. Easily known by its very peculiar mycelium.

## 21. TRAMETES, *Fr.*

Hymenophorum descending into the trama of the pores without any change, which are permanently concrete with the pileus. Pores entire.\*

\* Some of the *Polypori*, as *P. versicolor*, for example, have the trama, though

1. *T. pini*, *Fr.*; pileus corky, hard, pulvinate, concentrically sulcate, cracked and pitted, rough, ferruginous-brown, then black, tawny-ferruginous within; pores large, roundish or oblong, yellow, inclining to red-brown.

On pine-trunks. Rare. Scotland, *Klotzsch*.

2. *T. suaveolens*, *Fr.*; pileus corky, rather soft, pulvinate, villous, zoneless, white; pores round, rather large, obtuse, white, inclining to brown.—*Huss.* i. t. 43.

On willows, limes, etc. Not common. Bristol, *Dr. Stephens*, etc. King's Cliffe. Smell like that of aniseed.

3. *T. odora*, *Fr.*; pileus corky, elastic, uneven, gradually becoming smooth, zoneless, pallid; pores minute, round, equal, dirty-white, inclining to ochre.—*Bolt.* t. 162.

On willows. Rare. Bristol, *Dr. Stephens*. Very nearly related to the last. It has the same smell.

4. *T. gibbosa*, *Fr.*; dirty-white; pileus corky, villous, obsoletely zoned, extended behind and gibbous; pores linear, straight, equal.—*Sow.* t. 194; *Huss.* ii. t. 4.

On gate-posts, stumps, etc. Rare. Bristol, *C. E. B.* Resembles somewhat thick specimens of *Lenzites betulina*. Very variable, however, in thickness. Always truly porous, though the pores are elongated. Sowerby's plant grew at the foot of a poplar.

thin, of the same structure with the hymenophorum. These, however, are not closely allied to *Trametes*, and have been separated by Fries under the generic name of *Polystictus*, the technical character being derived from the fact that the pores, which are developed in a centrifugal direction, are perpendicular to the fibrillose stratum above the hymenophorum, whereas in *Trametes* the hymenophorum is not distinct from the rest of the pileus. I have retained for the present the arrangement proposed by Fries in the 'Epicrisis,' though the genus *Polystictus* will, in all probability, be ultimately adopted. No inconvenience is likely to arise, as the genus *Trametes* includes so few British species.

22. DÆDALEA, *P.*

Hymenophorum descending into the trama without any change. Pores, when fully formed, torn, toothed, or labyrinthiform.

1. *D. quercina*, *P.*; pileus corky, rugged, unequal, nearly smooth, of the same colour within; hymenium at first porous, then broken up into waved or gill-like, labyrinthiform sinuses; edge obtuse. (Plate 19, fig. 5.)

On oak-stumps, rails, etc. Not uncommon. Sometimes resupinate. Very near some states of *Lenzites*, but evidently belonging to the pore-bearing, rather than the gill-bearing series.

2. *D. confragosa*, *P.*; pileus corky, coriaceous, rather convex, scabrous, somewhat zoned, self-coloured, brownish-red, subferruginous or wood-coloured within; hymenium porous, then labyrinthiform and torn, at length reddish-brown.—*Bolt. t.* 160; *Sow. t.* 193.

On willows, service, etc. Rare. Bristol, *C. E. B.* King's Cliffe, etc. Sowerby's plant is the same with Boltor's.

3. *D. unicolor*, *Fr.*; pileus coriaceous, corky, villosostri-gose, cinereous, with zones of the same colour; sinuses labyrinthiform, flexuous, intricate, acute, then torn and toothed.—*Sow. t.* 325.

On stumps, etc. Very common.

4. *D. latissima*, *Fr.*; corky, hard, thick, undulated, reddish-brown or pallid wood-colour; pores thin, distant, very obtuse, roundish and elongated, flexuous.—*Sow. t.* 424.

On dead branches, or on the ground. Rare.

23. MERULIUS, *Fr.*

Hymenium soft, waxy, forming porous, reticulate, or sinuous, toothed folds.

1. *M. tremellosus*, *Schrad.*; resupinate, then free or reflexed, of a tremelloid fleshy consistence, white; margin dentato-radiate; folds porous, various, pinkish.—*Huss. i. t. 10.* *Boletus arboreus*, *Sow. t. 316.*

At the base of decayed trees. Rare. Apethorpe, etc. Sometimes the edge is beautifully tinged with pink, as in Mrs. Hussey's plant.

2. *M. corium*, *Fr.*; resupinate, effused, soft, thin, like paper; circumference at length free and reflexed, white and villous below; hymenium reticulato-porous, flesh-coloured or pallid-tan.—*Grev. t. 147.*

On dead trunks, etc. Extremely common. Very variable.

3. *M. molluscus*, *Fr.*; effused, thin, soft, membranaceous; margin byssoid, white; folds flesh-coloured, gyrated, and forming pores.—*Pers. Myc. Eur. t. 14. f. 1, 2.*

On dead wood. Rare. Penzance, *Mr. Ralfs.* Hymenium dark-brown when old.

4. *M. Porinoides*, *Fr.*; crustaceous, adnate, thin; circumference byssoid, white; folds poriform, distant, dirty-yellow.—*Pers. Myc. Eur. t. 14. f. 7.*

On dead wood, chips, etc., or on the ground. Very rare. Bristol, *C. E. B.*

5. *M. rufus*, *P.*; crustaceo-adnate, smooth, red-brown; circumference nearly naked, of the same colour, as also the uniformly porous hymenium.—*Pers. Myc. Eur. t. 16. f. 1, 2.*

On fallen oak-boughs. Bristol, *C. E. B.*, etc. This has a very Polyporoid appearance, and I am not certain that it is anything more than a state of *Dædalea confragosa*, of which, I believe, *Trametes rubescens* is a synonym.

6. *M. serpens*, *Fr.*; crustaceo-adnate, thin, at length smooth, pallid, then reddish; circumference byssoid, white; folds at first mere wrinkles, then forming entire angular pores.

On dead wood. Rare. Twycross, *Rev. A. Bloxam*. Not separable, like *M. corium*.

7. *M. pallens*, *B.*; adnate, thin, inseparable, pale-reddish, fleshy, subglutinous; folds poriform; margin indeterminate.—*Ann. of Nat. Hist. ser. 1. vol. vi. p. 358*.

On fir-wood. Rare. Nottinghamshire and Leicestershire. Pores minute.

8. *M. Carmichaelianus*, *B.*; white, extremely thin, forming effused, entirely resupinate, irregular, interrupted, confluent patches; folds forming regular angular reticulations; dull brown when dry.—*Grev. t. 224*.

On bark. Very rare. Appin, *Capt. Carmichael*. Forming a mere pellicle, with minute, often hexagonal, extremely shallow pores.

9. *M. lacrymans*, *Fr.*; large, fleshy but spongy, moist, ferruginous-yellow, arachnoid and velvety beneath; margin tomentose, white; folds ample, porous, and gyroso-dentate. (Plate 2, fig. 1.)—*Huss. i. t. 3*.

In cellars and hollow trees. Too common. Often dripping with moisture. Sometimes several feet in width. I do not consider *M. pulverulentus* more than a mere form of the same thing. Dry Rot is caused mainly by this fungus.

10. *M. aurantiacus*, *Klotzsch*; pileus tough, carnosoco-riceous, effuso-reflexed, zoned, tomentose, between yellow and dirty-white, here and there cinereous; folds minute, subporiform, dull-orange.

On dead beech-trees. Rare. Scotland, *Klotzsch*. Allied to the last.

#### 24. POROTHELIUM, *Fr.*

Hymenophorum mycelioid, covered with distinct papillæ, at first closed, then open like pores.

1. *P. Friesii*, *Mont.*; effused, confluent, flocculoso-membranaceous, white, inclining to tan-colour; circumference simple; papillæ immersed, yellowish, at length open, pitcher-shaped.—*Ann. de Sc. Nat. sér. 2. vol. v. p. 339.*

On pine-wood. Very rare. Castle Semple, *Klotzsch*. Wraxall, Somersetshire, *C. E. B.* Wothorpe, Northamptonshire. Pores often crowned with a pellucid drop.

### 25. FISTULINA, *Bull.*

Hymenophorum fleshy. Hymenium inferior, at first papillose; the papillæ at length elongated, and forming distinct tubes.

1. *F. hepatica*, *Fr.*; fleshy and juicy, rootless; pileus undivided, blood-red. (Plate 17, fig. 1.)—*Huss. i. t. 65.*

On trunks of old oaks. Common. Esculent. Sometimes attaining an enormous size. Tubes flesh-coloured or yellowish.

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### ORDER 3. HYDNEI.

Hymenium spread over the surface of spines, teeth, persistent papillæ, etc., and not lining impressed pores or tubes.

### 26. HYDNUM, *L.*

Spines awl-shaped or compressed, distinct at the base.

\* *Stem central.*

1. *H. imbricatum*, *L.*; pileus fleshy, nearly plane, somewhat umbilicate, rough with tessellated scales, floccose, zoneless, umber; stem short, even; spines decurrent, pale-cinereous.—*Grev. t. 71.*

On the ground, in pine-woods. Not common. Of the two forms, the one with thick persistent scales alone has been at present found in Great Britain.

2. *H. repandum*, *L.*; pileus fleshy, compact, rather waved, nearly smooth, pallid, as well as the irregular stem; spines unequal, of the same colour. (Plate 17, fig. 2.)—*Huss.* i. t. 16.

On the ground, in woods. Common. Esculent. *H. rufescens* is a variety with a redder colour.—*Bolt.* t. 89.

3. *H. compactum*, *Fr.*; pileus corky, compact, waved and tuberculate, zoneless, olivaceous, cinereous, or brown, commonly involved in white down, variegated with blue within; stem very short, irregular, tawny-brown; spines brownish, pale at the tips.—*Batsch*, f. 221.

On the ground, on heaths, and in fir-woods. Rare. Bungalow, *Woodward*. Aviemore, *Klotzsch*.

4. *H. zonatum*, *Batsch*; ferruginous; pileus coriaceous, thin, expanded, somewhat funnel-shaped, zoned, at length smooth, radiato-rugose; margin pale, sterile; stem slender, nearly equal, floccose, tuberous at the base; spines slender, pallid, then of the same colour as the pileus.—*Batsch*, f. 224.

In woods. Rare. Cork, *Mr. Denis Murray*.

5. *H. graveolens*, *Delastre*; pileus coriaceous, thin, soft, zoneless, wrinkled, dark brown, cinereous when dry, brown within; margin whitish; stem slender; spines short, grey.

In woods. Rare. Wales, *Mr. Ralfs*. Worcestershire. Has a strong and persistent smell of melilot.

\*\* *Stem lateral.*

6. *H. auriscalpium*, *L.*; pileus dimidiate, kidney-shaped, coriaceous, hairy, bright brown, inclining to black; stem slender, rooting, hairy, of the same colour; spines tough, bright brown.—*Grev.* t. 196.

On fir-cones. Common. Extremely pretty.

\*\*\* *Branched or tuberculiform, immarginate.*

7. *H. coralloides*, Scop.; very much branched, white, at length yellowish, broken up into intricate attenuated branches; spines unilateral, awl-shaped, entire.—*Sow. t. 252.*

On decayed fir, beech, ash, etc. Rare. Young plant resembling a cauliflower. Edulent.

8. *H. Erinaceus*, Bull.; flesh tough, elastic, pendulous, tuberculate, immarginate, white, acquiring a yellow tinge above, torn into fibres; spines very long, straight, equal, pendulous.—*Bull. t. 34.*

On trunks of oak, beech, etc. Rare.

9. *H. Caput-Medusæ*, Bull.; fleshy, tuberculiform, somewhat stipitate, white, then cinereous; upper spines distorted, lower fertile, long, straight.—*Bull. t. 412.*

On trunks of trees. Rare. Oxfordshire, *C. P. Berkeley.*

\*\*\*\* *Stemless, dimidiate.*

10. *H. gelatinosum*, Scop.; pileus gelatinous, tremulous, dimidiate, substipitate, glaucous, turning brown, papillate; spines soft, pyramidal, glaucous.—*Kromb. t. 50. f. 18, 22.*

On trunks of firs. Very rare. Weybridge, *Mr. F. Currey.*

11. *H. ochraceum*, P.; pileus effuso-reflexed, thin, coriaceous, zoned, ochraceous; spines very small, pinkish-ochre.—*Sow. t. 15.*

On fallen sticks, etc. Common. Easily removed from the matrix. Often resupinate.

\*\*\*\*\* *Resupinate.*

12. *H. squalinum*, Fr.; subiculum firm, coriaceous, adnate, wood-coloured; spines long, crowded, stout, compressed, entire, at length brownish.—*Bolt. t. 74.*

On trunks of trees, especially beech. Admitted on the authority of the figures of Ray and Bolton.

13. *H. membranaceum*, *Bull.*; subiculum effused, waxy, membranaceous, agglutinate, smooth, tawny-ferruginous; spines awl-shaped, crowded, equal, acute, of the same colour.—*Sow. t.* 327.

On fallen sticks. Not uncommon. Spines often collected in bundles.

14. *H. Weinmanni*, *Fr.*; subiculum effused, waxy, membranaceous, agglutinate, smooth, greyish fawn-colour; spines minute, sharp, rather distant, equal.—*Pers. Myc. Eur. t.* 22. *f.* 2.

On fallen branches. Bristol, *Dr. Stephens*.

15. *H. fuscum*, *P.*; effused, rufous-brown; circumference paler, coarsely byssoid; spines long, quite entire, close, very acute, shining, as if varnished.—*Pers. Myc. Eur. ii. t.* 17. *f.* 3.

On dead wood. Very rare. Wrabness, Essex, *Rev. R. T. Lowe*. Differs from *H. fusco-atrum*, *Fr.*, in its long spines.

16. *H. ferruginosum*, *Fr.*; subiculum effused, tomentose, tawny-ferruginous, as well as the crowded, conico-subulate, acute spines.—*Nees, Syst. f.* 248.

On decaying wood. Not uncommon. Separable from the matrix, almost mucedinous when not fully developed.

17. *H. varicolor*, *P.*; subiculum effused, aduate, furfuraceo-crustaceous; spines crowded, short, conical, unequal, minute, brownish.

On dead stumps. Rare. Clifton, Nottinghamshire. Compared with an authentic specimen from Fries.

18. *H. alutaceum*, *Fr.*; subiculum longitudinally effused, crustaceous, adnate, smooth, pale-ochre; circumference naked; spines minute, crowded, equal, acute.

On dead wood. Rare. Colleyweston, Northamptonshire. My plant is not on fir-wood, like that of Fries.

19. *H. spathulatum*, *Fr.*; subiculum effused, membranaceous, seceding, dirty-white, verging on yellow; circumference fimbriate; spines spathulate, oblique, orange.

On decaying wood. Very rare. Apethorpe, Northamptonshire. Spines, however, scarcely orange, yet agreeing with authentic specimens from Schweinitz. Separable.

20. *H. udum*, *Fr.*; subiculum effused, thin, subgelatinous, agglutinate, smooth, flesh-coloured, then watery-yellow; spines crowded, unequal, forked and fimbriate, of the same colour. (Plate 17, fig. 3.)

On fallen branches. Not uncommon. So nearly allied to *H. membranaceum*, that it is difficult to draw the line between them.

21. *H. niveum*, *P.*; white; subiculum effused, thin, membranaceous, adnate; circumference byssoid; spines short, crowded, equal, smooth.—*Pers. Disp. t. 4. f. 6, 7.*

On dead wood, leaves, etc. Rare. Bristol, *C. E. B.*

22. *H. farinaceum*, *P.*; white; subiculum effused, indeterminate, crustaceous, mealy; circumference slightly flocculose; spines slender, rather distant, very acute, quite entire.

On decayed wood. Not uncommon. Varies a little in tint.

23. *H. plumosum*, *Duby*; downy, snow-white; subiculum very delicate; spines divided, feathered at the apex.—*Bot. Gall. ii. p. 778.*

On dead wood. Rare. Lambley, Nottinghamshire.

## 27. SISTOTREMA, *P.*

Hymenium spread over gill-like teeth, irregularly distributed, distinct from the pileus, and easily separable.

1. *S. confluens*, *P.*; simple, confluent, white; pileus fleshy, irregular, horizontal, villous; stem somewhat excentric; teeth flexuous.—*Grev. t.* 248.

On the ground. Not common. At length yellowish, or tinged with brown. Teeth entire, or jagged.

## 28. IRPEX, *Fr.*

Teeth formed at an early stage of the growth of the subiculum, concrete with it, and disposed in rows or like network, and connected together.

1. *I. pendulus*, *Fr.*; pilei membranaceous, plicate, clothed with adpressed, pilose scales, yellow, extended behind, pendulous; margin and large, seriate, incised teeth white.—*Alb. and Schw. t.* 6. *f.* 7.

On pine-wood. Rare. Scotland, *Klotzsch*. There is a strong analogy between this curious plant and *Lentinus cochleatus*. No one now knows what *Hydnum crispum*, Schæff., is. It probably belongs to this genus, and is said to have been found by Sibthorp and others.

2. *I. Johnstoni*, *n. s.*; pure white, coriaceo-membranaceous, separable from the matrix; circumference naked; teeth compressed, unequal, disposed in rows.

On dead branches. Berwick, *Dr. Johnston*. This was referred to *I. lacteus* in the 'English Flora,' but that is a far thicker and very different species. The separable subiculum, and pure, unchangeable white, distinguish it from *I. candidus*, Weinm.

3. *I. obliquus*, *Fr.*; effused, crustaceous, adnate, white, becoming pallid; circumference byssoid; teeth springing from a porous base, compressed, unequal, incised, oblique.—*Bolt. t.* 167. *f.* 1.

On fallen branches. Not common. Berwick, *Dr. Johnston*.  
Linlithgowshire, *Dr. Bauchop*.

### 29. RADULUM, *Fr.*

Tubercles rude, irregular, commonly elongated and cylindrical, obtuse, waxy.

1. *R. orbiculare*, *Fr.*; in the autumn effused, orbicular, confluent, white, then yellowish; circumference byssoid; tubercles elongated, irregular, roundish, scattered or fasciculate; in the spring waxy, smooth, flesh-coloured; tubercles shorter and broader.—*Grev. t.* 278.

On dead branches of birch. Not uncommon in some districts.

2. *R. quercinum*, *Fr.*; roundish, then widely confluent, innate, crustaceous, becoming smooth, white, then pallid; tubercles roundish, elongated, stout, obtuse, scattered or fasciculate, irregular, floccoso-villous at the tips.—*Raii Syn. t.* 1. *f.* 4.

On branches of oak. Rare. Chester, *A. B. Hill*. East Bergholt, etc. *Hydnum Barba-Jovis*, Sow., belongs to this species.

### 30. PHLEBIA, *Fr.*

Hymenium soft and waxy (subgelatinous), spread over persistent crest-like wrinkles or veins, whose edge is entire.

1. *P. merismoides*, *Fr.*; effused, flesh-coloured, then livid, white and villous beneath; circumference orange, strigose; wrinkles simple, straight, crowded.—*Grev. t.* 280; *Huss. ii. t.* 44.

On old stumps and decayed branches, often running over mosses. Rare. Thin, almost tremelloid when fresh.

2. *P. radiata*, *Fr.*; suborbicular, equal, smooth on either

side, bright red, flesh-coloured; circumference radiato-dentate; folds straight, radiating in rows.—*Sow. t.* 291!

On bark. Very rare. Appin, *Capt. Carmichael*. Twycross, *Rev. A. Bloxam*. Bright in colour, almost orange. Thicker than the last.

3. *P. contorta*, *Fr.*; effused, rather firm, rufous, then brown, smooth on either side; circumference indeterminate; folds collected in little patches or ramulose, somewhat flexuous, disposed irregularly.—*Pers. Myc. Eur. t.* 18. *f.* 5.

On decayed wood, etc. Rare. Linlithgowshire, *Dr. Bauchop*. This is the only species of which I have not authentic specimens.

4. *P. vaga*, *Fr.*; effused, adnate; circumference byssoid, fibrillose, dirty-yellow; hymenium yellowish-grey, formed of creeping, intricate veins, which at length coalesce.

On decayed wood. Common. Arachnoid at first, then traversed with intricate, fructifying veins rather than wrinkles, which multiply rapidly, and form an intricate mass.

### 31. GRANDINIA, *Fr.*

Hymenium waxy, granulated; granules obtuse, entire, equal, crowded, smooth, persistent.

1. *G. granulosa*, *Fr.*; waxy, widely effused, agglutinate, tan-coloured; circumference determinate, smooth; hymenium equal; granules hemispherical, equal, crowded.

On fallen branches. Common.

### 32. ODONTIA, *Fr.*

Subiculum formed of interwoven fibres, clothed with papillose or spine-shaped warts, which are crested at the apex.

1. *O. fimbriata*, *Fr.*; effused, membranaceous, separating

from the matrix, traversed by rhizomorphoid threads; circumference fibrilloso-fimbriate; warts minute, granular; apex multifid, reddish.

On fallen branches. Not uncommon. Frequently tinged with lilac. Very pretty.

### 33. KNEIFFIA, Fr.

Soft, loosely fleshy, flocculose and collapsing when dry, hymenium rough with rigid, scattered, and fasciculate bristles.

#### 1. *K. setigera*, Fr.

On fallen branches. Not common. Wraxall, Somersetshire, C. E. B. White, somewhat resembling *Grandinia granulosa* in general appearance.

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## ORDER 4. AURICULARINI.

Hymenium confluent with the hymenophorum, at first even or rarely veined, and commonly remaining even.\*

### 34. CRATERELLUS, Fr.

Fleshy. Hymenium unchangeable, carnosomembranaceous, distinct, smooth, even, or at length rugose. Putrescent when old.

1. *C. lutescens*, Fr.; pileus submembranaceous, tubæform, soon pervious, brown, flocculose; stem hollow, yellow; hyme-

\* In some *Auricularini* there are spurious papillæ which are wholly accidental, and not essential, like the granules of *Grandinia*. *Craterellus* is confluent with *Cantharellus*, and *Thelephora* with *Grandinia*, but the veins of the one and the papillæ of the other are less determinate. The folds in *Auricularia* are still less essential, and depend upon the nature of the texture. Natural, however, as the whole group is, it is difficult to define it in words.

nium remotely costate, even, then rough with interwoven veins.—*Bolt. t. 105. f. 2.*

In woods. Very rare. Edinburgh, *Dr. Greville.*

2. *C. cornucopioides*, *Fr.*; pileus submembranaceous, trumpet-shaped, pervious, minutely squamulose, dingy-black; stem hollow, black, even, then obscurely wrinkled, cinereous. (Plate 19, fig. 6.)—*Huss. ii. t. 37.*

In woods, on the ground. Local.

3. *C. sinuosus*, *Fr.*; pileus slightly fleshy, funnel-shaped, undulated, flocculoso-villous, brownish-grey; stem stuffed, pallid-cinereous, as well as the hymenium, which is at length implexo-rugose.—*Vaill. Par. t. 11. f. 11-13.*

In woods. Scotland, *Mrs. Wynne.*

4. *C. crispus*, *Fr.*; pileus crisped, dingy, somewhat tawny; stem stuffed below; hymenium nearly even.—*Sow. t. 75; Huss. ii. t. 18.*

In woods. Not uncommon. Hymenium sometimes white, sometimes dingy.

### 35. THELEPHORA, *Fr.*

Pileus destitute of cuticle, consisting of interwoven fibres. Hymenium costato-striate or papillose, of a tough, fleshy consistence, at length rigid, and finally collapsing and flocculent.

\* *Not resupinate.*

1. *T. Sowerbeii*, *Berk.*; coriaceous, somewhat funnel-shaped, reddish-brown, zoned; margin subplicate, dirty flesh-coloured beneath, smooth; substance of the same colour as the pileus.—*Sow. t. 155.*

On the ground, in woods. Rare. Cotterstock, Northamptonshire. In Sowerby's original specimens there is not the least trace of hairs on the hymenium: they cannot, therefore,

be the same with the plant of Fries and Persoon. The same species occurs in Australia.

2. *T. tuberosa*, *Grev.*; subcoriaceous, smooth, pallid, becoming rufous; pileus cut down to the bulbous stem into compressed branches, disposed so as to assume the form of funnels; hymenium inferior, smooth.—*Grev. t.* 178.

On the ground. Extremely rare. Edinburgh, *Dr. Greville*.

3. *T. anthocephala*, *Fr.*; soft, but coriaceous, subferruginous; pileus cut down, as far as the simple, equal, villous stem, into suberect laciniae, which are dilated and fimbriate above; hymenium inferior, even. (Plate 17, fig. 4.)—*Sow. t.* 156.

On the ground, in woods. Not uncommon. Scentless. Very variable as to the form of the bleached laciniae. Sometimes regular, as in Bulliard's fig. t. 452. f. 1, sometimes irregular, as in the figures quoted above.

4. *T. caryophyllæa*, *Fr.*; subcoriaceous, brown, purple; pileus depressed, fibrous, torn; margin sometimes incised, sometimes cut into linear divisions; hymenium nearly even, smooth.

On the ground, in woods. Rare. Bungay, *Mr. Stock*, abundantly. Sometimes regularly infundibuliform.

5. *T. palmata*, *Fr.*; soft, but coriaceous, erect, very much branched, pubescent, brown-purple; base simple, stem-shaped; branches flat, even, dilated above, palmate, somewhat fastigiate; tips fimbriate, whitish.—*Grev. t.* 46.

On the ground. Not common. Very fetid.

6. *T. terrestris*, *Fr.*; caespitose, soft, brown, at length blackish; pileoli imbricate, flattened, fibroso-strigose, zoneless, elongated into a somewhat lateral stem; hymenium inferior, radiato-rugose.—*Nees, f.* 251.

On the ground. Not common. *T. laciniata* is often confounded with this.

7. *T. cristata*, *Fr.*; incrusting, rather tough, pallid, tufted, passing into branches or ascending tufted laciniae; subulate and fimbriate at the apex; hymenium papillose on even patches or the sides of the branches.—*Sow. t.* 158.

On mosses, etc. Not uncommon.

8. *T. fastidiosa*, *Fr.*; very fetid, effused, soft, shapeless, white, passing into plate-like branches; hymenium inferior, at length rufous, papillose.

On the ground. Not common. Bristol, *Dr. Stephens*, etc. Smell disgusting. Looks at first sight like some *Mycelium*.

9. *T. mollissima*, *P.*; soft, fleshy, incrusting; pilei effuso-reflexed, laciniate, subtomentose, dirty-white; hymenium inferior, even, brown-purple. (Plate 17, fig. 5.)

On the ground, in woods. Not uncommon. Extremely variable. Sometimes quite effused, sometimes assuming the form of *T. palmata*. The form in the figured specimen arises partly from incrusting the old stumps of large grasses.

10. *T. laciniata*, *P.*; soft, coriaceous, incrusting, ferruginous-brown; pilei somewhat imbricated, effuso-reflexed, fibroso-squamose; margin fibrous, fimbriated, at first dirty-white; hymenium inferior, papillose, flocculose.—*Sow. t.* 213.

On branches, heathy ground, etc. Common. Sometimes quite resupinate, sometimes almost dimidiate, but effused behind.

11. *T. biennis*, *Fr.*; coriaceous, soft, broadly incrusting, cinereous-brown; pilei at length reflexed, but narrow, tomentose; circumference fimbriated; hymenium subresupinate, smooth, subsetulose, plicate at the base.—*Bull. t.* 436.

On the ground, incrusting stones, stumps, etc. Very rare. Kew Gardens. Bowood, Wiltshire, *C. E. B.*

\*\* *Resupinate.*

12. *T. cæsia*, *P.*; effused, determinate, soft, glaucous-ash-coloured; hymenium nearly even.

On the ground, in woods. Not uncommon. Bristol. Northamptonshire. The hymenium, with its quaternate spores, is a pretty, opaque object under the microscope.

13. *T. byssoides*, *P.*; irregularly effused, at first byssoid, ochraceous-white, then compact and fleshy, pulverulent, ferruginous-yellow; circumference byssoid, nearly white.

On the ground, especially amongst fir-leaves, making patches a foot broad. Not uncommon. The ferruginous spores at once separate this from every form of *T. mollissima*.

14. *T. puteana*, *Schum.*; roundish and effused, fleshy, rather thick, brittle, yellowish, then tawny-olive, at last brownish-olive, dusted with the spores; circumference mucedinous, white; hymenium somewhat undulated.

On stumps, wood in cellars, etc. Not uncommon. Sometimes dripping with moisture. Occasionally large, globular, solid or hollow lumps, are formed upon the hymenium, giving the plant a very singular appearance.

15. *T. laxa*, *Fr.*; membranaceous, soft, loosely adherent, arachnoid beneath, white as well as the byssoid circumference; hymenium papillose, pallid, then ferruginous-olive, dusted with the ferruginous spores.

On lichens, moss, etc. Rare. King's Cliffe. Oswestry, *Rev. T. Salwey*.

16. *T. arida*, *Fr.*; membranaceous, soft, arachnoid beneath, and white as well as the byssoid circumference; hymenium papillose, pallid, then ferruginous-olive.

On decayed pine-wood, in cellars and woods. Common. Not so thick as *T. puteana*.

17. *T. olivacea*, *Fr.*; membranaceous, effused, adnate; circumference white, fimbriated; hymenium dull-olive, setuloso-tomentose.

On pine-wood. Northamptonshire, etc. Probably common. I have authentic specimens of this species from Fries.

18. *T. anthochroa*, *P.*; effused, subadnate; circumference byssoid, paler; hymenium even, brownish-rose, at length pallid, floccose and velvety.

Var. *versicolor*.

On sycamore twigs. Rare. Wotthorpe. My plant, when dry, resembles authentic specimens from Fries, but when fresh is variously tinted with fugitive shades of lilac and brown.

### 36. STEREUM, *Fr.*

Hymenium coriaceous, rather thick, concrete with the intermediate stratum of the pileus, which has a cuticle, always even and veinless, unchangeable, not beset with bristles.

1. *S. purpureum*, *Fr.*; soft, but coriaceous; pileus effuso-reflexed, obsolete zoned, villosa-tomentose, pallid or dirty-white; hymenium naked, even, smooth, purplish or lilac.—*Sow. t.* 388. *f.* 1; *Huss. i. t.* 20.

On trunks of fallen trees, especially poplars. Extremely common, and often very beautiful. *Auricularia elegans*, *Sow. t.* 412. *f.* 1, is merely a state of this.

2. *S. hirsutum*, *Fr.*; coriaceous; pileus effused and reflexed, strigoso-hirsute, somewhat zoned, turning pallid; margin rather obtuse, yellow; hymenium even, smooth, naked, juiceless, bright tawny-yellow, unchanged when bruised. (Plate 17, fig. 7.)—*Huss. i. t.* 58.

On stumps of trees, etc. Everywhere. Found also in subtropical countries.

3. *S. spadiceum*, *Fr.*; coriaceous; pilei effuso-reflexed, villos, subferruginous; margin rather obtuse, white, even beneath, smooth, brownish, when fresh bleeding if bruised.—*Sow. t.* 28.

On sticks, especially oak. Common. Often very pretty; variable in colour, but easily distinguished from every species

except *S. rugosum* and the following, which is confined to Conifers, by its turning red when scratched or bruised.

4. *S. sanguinolentum*, *Fr.*; thin, coriaceous; pileus effused and reflexed, silky, somewhat striate, pallid; margin acute, white; hymenium even, smooth, cinereous-brown, bleeding when wounded.—*Grev. t.* 225.

On wood of Conifers. Very common. Colour far less bright than that of the last. *A. hepatica*, *Sow. t.* 388. f. 2, is merely a washed state of one of the foregoing species, probably *S. purpureum*.

5. *S. rugosum*, *Fr.*; corky, rigid; pileus effused and shortly reflexed, obtusely margined, at length smooth, bright brown; hymenium dull, pruinose, bloodstained when wounded.

On stumps, especially hazel. Extremely common. Sometimes surviving one or more seasons, and then thick and zoned within. *T. Laurocerasi*, *Berk.* in *Eng. Fl.*, is, I believe, a thin, resupinate form of this species. *A. cinerea*, *Sow. t.* 388, f. 3, is, I think, merely *Corticium quercinum*.

6. *S. acerinum*, *Fr.*; crustaceo-adnate, even, smooth, white.

On trunks of living maples. Very common.

### 37. HYMENOCHÆTE, *Lév.*

Coriaceous, dry. Hymenium even, beset with short, stiff, coloured bristles.

1. *H. rubiginosa*, *Lév.*; coriaceous, rigid; pileus effuso-reflexed, somewhat fasciate, velvety, rust-coloured, then smooth, bright brown; intermediate stratum tawny-ferruginous; hymenium ferruginous.—*Sow. t.* 26.

On gate-posts, etc. Very common.

2. *H. tabacina*, *Lév.*; coriaceous, then flaccid; pileus effused, reflexed, silky, at length smooth, subferruginous; margin and intermediate filamentous stratum golden-yellow; hymenium paler.

On fallen branches. Rare. Gracedieu, Leicestershire, etc. Sow. t. 25, belongs to *Stereum spadiceum*.

3. *H. corrugata*, *B.*; effused, closely adnate, indeterminate, cinnamon, cracked when dry.—*Grev. t.* 234.

On sticks, in woods. Very common. Varying in colour, ferruginous, copper-coloured, etc. It certainly ought not to be placed in a distinct genus from the two preceding, of one of which it is possibly only a resupinate condition.

### 38. AURICULARIA, *Fr.*

Hymenium irregularly and distantly folded, gelatinous when wet, different in substance from the pileus.

1. *A. mesenterica*, *Bull.*; pilci resupinate, thin, reflexed, entire, villous, zoned, and fasciate, brownish-cinereous; hymenium costato-plicate, brownish-violet.—*Sow. t.* 290; *Huss. ii. t.* 6.

On stems of trees, etc. Not uncommon. In dry weather very thin, but reviving with wet.

2. *A. lobata*, *Somm.*; pileus effuso-reflexed, variegated with strigoso-tomentose, velvety and smooth zones, tawny, inclining to dirty-white; hymenium livid-tawny; folds distant, forming a loose network. (Plate 18, fig. 1.)

On bark of trees. Not common. Staunton, Nottinghamshire. Very nearly allied to the last.

### 39. CORTICIUM, *Fr.*

Hymenium soft and fleshy, swollen when moist, collapsing and becoming even when dry, often rimose.

\* *Circumference* byssoid, *fibrillose*, etc.

1. *C. giganteum*, *Fr.*; widely effused, when moist swelling, waxy, hyaline, white, when dry thin, but cartilaginous, free, milk-white; circumference strigoso-radiate; hymenium even.

On pine-stems, and from thence running over twigs, etc. Common. Sow. t. 349, is *Merulius corium*. Bolt. t. 166, f. *d*, is probably *Stereum rugosum*.

2. *C. lacteum*, *Fr.*; effused, membranaceous, milk-white beneath, with the circumference loosely fibrillose; hymenium, when perfect, waxy, darker, rimoso-partite when dry.

On trunks of trees, etc. Not uncommon. The mycelium sometimes forms white strings, which run about like those of *Clavaria stricta*, *Agaricus platyphyllus*, etc.

3. *C. arachnoideum*, *B.*; effused, delicately byssoid, as is the circumference; hymenium white, very thin, patchy.

In woods. Not uncommon, running over lichens, etc. The mycelium is as delicate as a spider's web.

4. *C. læve*, *Fr.*; effused, membranaceous, separating, villosifibrillose beneath; circumference byssoid, not radiating; hymenium even, smooth, pinkish, and livid.

On decaying wood, sticks, etc. This is the commonest of all the species, and assumes a variety of forms. Sometimes it remains closely attached, sometimes the margin is broadly reflexed. The hymenium also varies in colour, being sometimes pure white. The circumference is occasionally almost naked.

5. *C. roseum*, *P.*; effused, adnate, rose-coloured; circumference fringed, whitish; hymenium pruinose, becoming pale, at length much cracked and rugose, hardened.

On poplar. Not common.

6. *C. velutinum*, *Fr.*; effused, adnate, white, slightly tinged with pink; circumference ornamented with straight, strigose, diverging fibres, of the same colour; hymenium soft and fleshy, thick, even, velvety, with dense hyaline bristles.

On logs. Not uncommon. Very beautiful and distinct.

7. *C. sanguineum*, *Fr.*; bright scarlet, broadly effused, of

a soft cottony substance, at first thin, membranaceous, then thicker; circumference fibrillose.

On dead larch, etc. Rare. Abundant in Sherwood Forest. This is *C. miniatum*, Berk., whose differences vanish on the discovery of abundant specimens. Sow. t. 291 is *Phlebia radiata*.

8. *C. sulfureum*, Fr.; effused, fibrilloso-byssoid, bright sulphur-coloured; hymenium when perfect thick, waxy, somewhat tawny, rimose when dry.

On fallen sticks, etc. Not uncommon, but seldom perfect.

9. *C. cæruleum*, Fr.; roundish, then effused, adnate, at first bright blue; circumference byssoid, of the same colour, whitish; hymenium soft, waxy, papillose, at length smooth.—Huss. i. t. 20.

On rails, dead wood, etc. Extremely common. Said to be luminous in the dark.

10. *C. atro-virens*, Fr.; irregularly effused, black-green, of the same colour beneath, downy, as well as the circumference.

On sticks, in woods. Not common. Like Fries, I have never found a perfect hymenium.

11. *C. lactescens*, B.; agglutinate, soft, waxy, undulated, flesh-coloured, milky; margin shortly byssoid, at length cracked; interstices silky.

On decayed wood of willows, etc. Not uncommon. Smell like that of *Lactarius quietus*. Milk white, watery. Hymenium flesh-coloured or pale salmon-coloured.

\*\* *Circumference not distinctly byssoid, etc.; or if so, only at the very first.*

12. *C. calceum*, Fr.; effused, agglutinate, waxy, quite smooth, white; circumference like the rest of the plant; hymenium even, smooth, cracked when dry.

On pine-wood. Common. Varying in colour from white and tan-coloured to dingy. One or two *Corticia* not easily defined occur on oak-branches, etc., resembling this and *C. Sambuci*. They require further study before proposing them as species. *Thelephora cretacea*, P., and *T. dryina*, P., belong to these indeterminate species, and are both found in this country; the former on deal in hothouses, the latter on oak-branches.

13. *C. lividum*, P.; effused, agglutinate, waxy, soft, smooth, changing colour; circumference like the rest of the plant; hymenium naked, even, somewhat viscid, cracked when dry.

On wood. Not common. Appin, *Capt. Carmichael*.

14. *C. ochraceum*, Fr.; effused, agglutinate, soft, waxy, at length smooth; circumference white, somewhat radiating, evanescent; hymenium pallid, then ochraceous, pruinose, at length naked, tuberculated or papillose.

On pine-wood, etc. Not common.

15. *C. quercinum*, P.; membranaceous, waxy, at first agglutinate, indeterminate, then fixed in the centre, with the border free and involute, rigid, smooth and black below; hymenium tinged with pink.—*Grev. t.* 182.

On oak-branches. Extremely common.

16. *C. cinereum*, Fr.; waxy, at length rigid, confluent, agglutinate, lurid; hymenium cinereous from a very delicate bloom.

On dead wood, sticks, etc. Extremely common, and very variable. Frequently very thick on ash-twigs.

17. *C. incarnatum*, Fr.; waxy, at length rigid, confluent, agglutinate; circumference radiating; hymenium bright red or orange, sprinkled with a delicate flesh-coloured bloom.

On timber, rails, etc. Very common. Sometimes without any radiating circumference. Varying much in the depth of the tint.

18. *C. nudum*, *Fr.*; waxy, at length rigid, agglutinate, flesh-coloured, then pallid; circumference determinate, smooth; hymenium sprinkled with fugacious, dirty-white meal.

On twigs, in woods. Not uncommon.

19. *C. confluens*, *Fr.*; waxy, membranaceous, agglutinate; circumference radiating; hymenium naked, hyaline, then brightly coloured, somewhat shining.

On twigs of ash, etc. Not uncommon. Wothorpe, Northamptonshire, with the last. Often slight papillose.

20. *C. polygonium*, *P.*; determinate, adnate, grumoso-cartilaginous, hard, flesh-coloured; circumference of the same colour; hymenium continuous, red, coated with meal.

On poplar-branches, growing in little, round, detached patches, from the ostiola of *Sphæriæ*. Not uncommon.

21. *C. comedens*, *Fr.*; effused, exposed by the splitting of the cuticle of the matrix, thin, innate, flesh-coloured, at length pallid; hymenium even, smooth.

On branches of various trees. Extremely common. Hymenium variable in colour, sometimes white.

22. *C. Sambuci*, *P.*; effused, subinnate, variously incrusting, white, continuous when growing, cracked or collapsing when dry.—*Grev. t.* 242.

On elder-stumps. Extremely common. Very difficult to separate from *C. calceum* by a strict definition.

23. *C. Aurora*, *B. and Br.*; very thin, effused, agglutinate, rose-coloured, turning pallid; circumference indeterminate.

On dead leaves of *Carices*. Bathcaston. Resembles *Athelia Typhæ* and *A. epiphylla*, *P.* The latter is, I believe, only a state of *C. arachnoideum*, and has been found by Mr. Leighton at Shrewsbury.

40. CYPHELLA, *Fr.*

Submembranaceous, cup-shaped, elongated behind and frequently pendulous. Hymenium distinctly inferior, completely confluent with the pileus.

1. *C. griseo-pallida*, *Fr.*; submembranaceous, globose, then campanulate, sessile, pallid-grey, floccose externally; hymenium even, smooth.

On dead *Carex paniculata*. Spye Park, Wiltshire, *C. E. B.*

2. *C. muscigena*, *Fr.*; membranaceous, soft, nearly sessile, dimidiate, flattened, white, externally minutely silky; hymenium rugulose.—*Myc. Eur. t. 7. f. 6.*

On mosses. Not common. Hanham, near Bristol, *C. E. B.* Looks at first sight like a little *Cantharellus*.

3. *C. galeata*, *Fr.*; membranaceous, soft, nearly sessile, cup-shaped, then dimidiate, helmet-shaped, even, dirty-white; margin quite entire; hymenium at length somewhat rufous, rugulose.

On mosses. Not uncommon. Differs from the last in its dingy hue and bullate pileus.

4. *C. ochroleuca*, *B. and Br.*; membranaceous, cup-shaped, villous and ochroleucous above; margin at length split; hymenium even, pale ochre, brighter than the pileus.

On decayed bramble-twigs. Bathcaston, *C. E. B.*

5. *C. muscicola*, *Fr.*; membranaceous, nearly sessile, persistently cup-shaped, cinereous, dirty-white, turning pale, fibrilloso-striate externally; margin slightly downy, uneven, torn; hymenium even.

On mosses. Apethorpe, Northamptonshire, etc.

6. *C. lacera*, *Fr.*; membranaceous, cup-shaped, pendulous, then multifid; vertex stretched out, stem-shaped; striate above

with little black hairs; hymenium slightly wrinkled, dirty-white.—*Alb. and Schw. t. 1. f. 5.*

On dead stalks, twigs, etc. Not common. Apethorpe, Northamptonshire.

7. *C. capula*, *Fr.*; membranaceous, obliquely campanulate, stretched out into a curved stem, smooth, dirty-white; margin sinuated, irregular; hymenium even.—*Holmsk. ii. t. 22.*

On dead stems of herbaceous plants. Not uncommon. Looks like a *Peziza*. Sometimes yellow.

8. *C. Goldbachii*, *Fr.*; membranaceous, cup-shaped, urceolato-concave, sessile, externally white, villous; hymenium even, pallid.

On dead leaves of *Aira cæspitosa*. Spye Park, Wiltshire, *C. E. B.*

9. *C. cuticulosa*, *Fr.*; membranaceous, white, diaphanous, at first oblong, then cup-shaped, elongated into a stem, smooth externally.—*Dicks. iii. t. 9. f. 11.*

On dried grass-stems. Not found since the time of Dickson.

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#### ORDER 5. CLAVARIEI.

Hymenium scarcely distinct from the hymenophorum, vertical, amphigenous, reaching to the very apex, even, or at length wrinkled. Never incrusting or coriaceous.

#### 41. CLAVARIA, *L.*

Fleshy, branched or simple without any stem of a distinct substance; hymenium dry.

1. *Branched.*

\* *White-spored.*

1. *C. Botrytis*, *P.*; brittle; trunk thick, fleshy, unequal,

very much branched; branches swollen, unequal, rather wrinkled; tips red.—*Kromb. t. 53. f. 1, 4.*

In woods. Very rare. Inverary, *Lady Orde*. Bowood, *C. E. B.*

2. *C. amethystina*, *Bull.*; brittle, very much branched, violet; branches round, even, obtuse. (Plate 18, fig. 2: small variety.)—*Bull. t. 496. f. 2.*

In mossy places. Rare. Bristol, *H. O. Stephens*. Coed Coch. Most variable in size. Sometimes 3 inches or more high, and very much branched; sometimes a few lines, and nearly simple.

3. *C. fastigiata*, *D.C.*; tough, cæspitose, yellow, slender-stemmed, very much branched; branches short, divaricate; branchlets fastigiata.—*Holmsk. i. p. 90, with a figure.*

In pastures. Extremely common.

4. *C. muscoides*, *L.*; rather tough, graceful, yellow, slender-stemmed, twice or thrice forked; ramuli lunate, acute.—*Holmsk. i. p. 87, with a figure.*

In pastures. Not so common as the last.

5. *C. coralloides*, *L.*; rather brittle, white, hollow within; stem rather thick, repeatedly and irregularly branched; branchlets unequal, dilated above, very numerous, crowded, acute.—*Sow. t. 278.*

In woods. Not common. Kent, *Mrs. Hussey*.

6. *C. umbrina*, *B.*; pale-umber, slightly branched; branches and branchlets cylindrical, obtuse, forked. (Plate 18, fig. 4.)

On mossy lawns. Coed Coch. I find nothing at all agreeing with this. The habit is that of *C. fastigiata*. It has not, however, the slightest tinge of yellow.

7. *C. cinerea*, *Bull.*; brittle, stuffed, at length cinereous, very much branched; stalk short, thick; branches and branchlets thickened, irregular, somewhat wrinkled, obtuse.—*Grev. t. 64.*

In woods. Common in some districts.

8. *C. cristata*, *Holmsk.*; tough, even, stuffed, white or dingy; branches dilated above, acutely incised, crested.—*Grev. t.* 190.

In woods. Not uncommon.

9. *C. rugosa*, *Bull.*; tough, simple or branched, thickened above, wrinkled, white or dingy; branches few, irregular, obtuse. (Plate 18, fig. 3.)—*Grev. t.* 328.

In woods. Common. The dingy form requires to be carefully distinguished from *C. cinerea*.

10. *C. Kunzei*, *Fr.*; rather brittle, very much branched from the slender tufted base, white; branches elongated, crowded, repeatedly forked, somewhat fastigiata, even, equal; axils compressed.—*Bull. t.* 358. *f.* 1 *C.*

In woods. Very rare. Sherwood Forest.

\*\* *Spores yellowish or coloured.*

11. *C. aurea*, *Schæff.*; trunk thick, elastic, pallid, divided into numerous stout, straight, dichotomous, round, obtuse, rather toothed, yellow branches.—*Schæff. t.* 287.

In woods. Rare. Bristol, *Dr. Stephens.*

12. *C. abietina*, *Schum.*; very much branched, ochraceous; trunk rather thick, clothed with white down; branches straight, crowded when dry, longitudinally wrinkled; branchlets straight.—*Grev. t.* 117.

In fir-woods. Common. Sometimes turning green when bruised.

13. *C. flaccida*, *Fr.*; slender, very much branched, flaccid, ochraceous; trunk slender, smooth; branchlets crowded, unequal, converging, acute.

Amongst moss, in woods. Not common, King's Cliffe.

14. *C. crocea*, *P.*; minute, slender, saffron-yellow; trunk

naked, pale ; branches crowded, somewhat forked, as well as the similar branchlets.—*Pers. Ic. et Descr. t. 11. f. 6.*

On the ground. Very rare. Wraxall, Somersetshire, *C. E. B.*

15. *C. grisea, P.* ; firm ; trunk thick, dirty-white ; branches attenuated, rather wrinkled, obtuse, dingy-cinereous, as well as the unequal, obtuse branchlets.—*Kromb. t. 53. f. 9, 10.*

In woods. Rare. Appin, *Capt. Carmichael*. Known by its brownish spores.

16. *C. stricta, P.* ; very much branched, pallid, brown when bruised ; trunk rather thick ; branches and branchlets straight, even, adpressed, acute. (Plate 18, fig. 5.)—*Sow. t. 157.*

In gardens, springing from rotten woods. Rare. Kew, etc. Mycelium forming long creeping strings.

17. *C. crispula, Fr.* ; very much branched, tan-coloured, then ochraceous ; trunk slender, villous, sending out roots ; branches flexuous, multifid ; branchlets of the same colour, divaricate.—*Bull. t. 358. f. 1 a, b.*

At the base of trees. Rare. Woodnewton, in great quantities, in a hollow ash.

## 2. *Simple.*

\* *Clubs more or less connate at the base.*

18. *C. purpurea, Müll.* ; tufted, purple ; clubs elongated, hollow, then compressed, simple, acute.—*Fl. Dan. t. 837. f. 2.*

Amongst grass, in pastures. Tansor, Northamptonshire. Coed Coch. Of a dingy purple.

19. *C. rosea, Fr.* ; subfasciculate, brittle, rose-coloured ; clubs stuffed, at length yellowish at the apex.

In pastures. Rare. Leicestershire, *Rev. C. Babington*.

20. *C. fusiformis, Sow.* ; caespitoso-connate, rather firm, yellow, soon hollow ; clubs somewhat fusiform, simple and

toothed, even, attenuated into a base of the same colour.—*Sow. t.* 234.

Common in woods.

21. *C. ceranoides*, *P.*; fasciculate, unequal, slightly divided above, yellow; apex brown.—*P. Syn. p.* 594; *Sow. t.* 235.

In woods. Not common. Bagley Wood, Oxfordshire, *Rev. T. Hugo*, Nov. 1841. Distinct, I think, from the last.

22. *C. inæqualis*, *Müll.*; gregarious, subfasciculate, brittle, stuffed, yellow; clubs various, simple or forked, of the same colour below, continuous.—*Fl. Dan.* 836. *f.* 1; *Sow. t.* 253, *lower figures*; *Huss. i. t.* 18.

In woods, amongst grass. Common. A very variable plant. *Grev. t.* 37 is smaller, scarcely fasciculate, and much brighter in colour. *C. helvola*, *P.*, on the contrary, is of a dirty-yellow, with the tips cinnamon.

23. *C. argillacea*, *Fr.*; fasciculate, brittle, pallid clay-colour; clubs simple, variable; stem yellow, shining.

In heathy ground. Not uncommon. There is a variety with a white stem. The plant, moreover, is either dilated or cylindrical. The stem in this species is more distinct from the pileus than is consistent with the generic character.

24. *C. tenuipes*, *B. and Br.*; small, gregarious; club inflated, wrinkled, pallid clay-colour; stem slender, flexuous, somewhat distinct from the club.—*Ann. of Nat. Hist. ser. 2. vol. ii. t. 9. f. 2.*

On bare heathy ground. Sherwood Forest. About half an inch high, rarely confluent with the stem.

25. *C. vermiculata*, *Scop.*; æspitose, brittle, white; clubs stuffed, simple, cylindrical, subulate.

On lawns, and in short pastures. Extremely common. Looks like a little bundle of candles.

26. *C. fragilis*, *Holmsk.*; fasciculate or gregarious; very brittle; club hollow, obtuse, variable, attenuated and white below.—*Holmsk. i. p. 7, with a figure; Sow. t. 90, 232.*

In meadows, gardens, etc. Not so common as the last. Sowerby's plant, t. 90, is inflated; t. 232 is slender and more cylindrical, while Bolt. t. 111 represents a subulate form. Occasionally the plant is yellow, but always remarkable for its extreme brittleness.

\*\* *Clubs distinct at the base.*

27. *C. pistillaris*, *L.*; large, simple, fleshy, stuffed, everywhere smooth, obovato-clavate, obtuse, at length rufous.—*Huss. i. t. 62.*

In woods. Not common. Kent, *Mrs. Hussey*. King's Cliffe, etc. At first white or yellowish.

28. *C. contorta*, *Fr.*; simple, bursting through the bark, stuffed, between spongy and fleshy, somewhat twisted, wrinkled, obtuse, pruinose, watery-yellow or dirty-white.

On fallen branches. Rare. Gracedieu, etc. The erumpent habit easily distinguishes this curious species.

29. *C. Ardenia*, *Sow.*; simple, very long, incrassated upwards, hollow; apex obtuse and excavated, ferruginous, then bright brown, tomentose at the base, rootless.—*Sow. t. 215.*

On fallen branches. Very rare. Principally in the southern counties.

30. *C. juncea*, *Fr.*; gregarious, slender, filiform, flaccid, nearly equal, fistulose, acute, pallid, then reddish-brown, creeping at the base and fibrillose.—*Bull. t. 463. f. H.*

Amongst leaves, in woods. Sometimes very abundant.

31. *C. acuta*, *Sow.*; quite simple, straight, white; club distinct, acuminate, pruinose; stem cylindrical, equal.

On soil, in garden-pots. Not common. Sometimes rather obtuse.

32. *C. uncialis*, *Grev.*; quite simple, tough, straight, stuffed, obtuse, smooth, continuous below, attenuated.—*Grev. t. 98.*

On moist dead stems of *Umbelliferae*. Not uncommon.

#### 42. CALOCERA, *Fr.*

Gelatinous, subcartilaginous when moist, horny when dry. Hymenium viscid.

1. *C. viscosa*, *Fr.*; branched, tough, rooting, even, linear, golden-yellow; branches straight, repeatedly dichotomous.—*Schæff. t. 174.*

On stumps, in fir-woods. Not uncommon. A beautiful species.

2. *C. tuberosa*, *Fr.*; caespitose, simple, tough, even, linear, yellowish, tuberos and rooting at the base.—*Sow. t. 199.*

On stumps. Not found since the time of Sowerby.

3. *C. cornea*, *Fr.*; caespitose, rooting, even, viscid, orange; clubs short, subulate, connate at the base.

On stumps of trees, especially oak. Common.

4. *C. glossoides*, *Fr.*; simple, solitary, subtremelloid, yellow; club incrassated, obtuse, compressed; stem round.

On decayed oak-stumps. Very rare. Leigh Wood, Bristol.

#### 43. TYPHULA, *Fr.*

Stem filiform, flaccid. Club cylindrical, perfectly distinct. Hymenium thin, waxy.

1. *T. erythropus*, *Fr.*; simple; club cylindrical, smooth, white; stem nearly straight, dark-red, inclining to black.—*Grev. t. 43.*

On dead stems of herbaceous plants, etc. Very common. Always attached to a *Sclerotium*.

2. *T. phacorhiza*, *Fr.*; simple; club cylindrical, smooth, pallid; stem flexuous, smooth, brownish.—*Sow. t. 233.*

On dead herbaceous plants, leaves, etc. Attached to *Sclerotium complanatum* and *S. scutellatum*.

3. *T. incarnata*, *Fr.*; simple; club cylindrical, elongated, smooth, flesh-coloured, attenuated into the simple, subpilose, continuous stem.—*Grev. t.* 93.

On dead herbaceous plants, etc. Not common.

4. *T. muscicola*, *Fr.*; simple, subfiliform, smooth, slightly incrassated upwards, white; stem confluent or obsolete.—*Pers. Obs. ii. t.* 3. *f.* 2.

On the larger mosses. Not common. Perhaps more properly a *Pistillaria*. Sometimes not a line high.

5. *T. Grevillei*, *Fr.*; simple, white; club incrassated, obtuse; stem capillary, pilose.—*Grev. t.* 49.

On dead leaves, etc. Not uncommon.

6. *T. filiformis*, *Fr.*; club incrassated, dirty-white; stem decumbent, somewhat branched, bright brown.—*Sow. t.* 387. *f.* 4.

Amongst dead leaves. I am not acquainted with this species.

7. *T. gracilis*, *Berk. and Desm.*; club simple or forked, pallid, acute; stem short, distinct.

On putrid leaves. Not common. Head rough with spores and little prominent bristles. Very near to *Isuria*.

#### 44. PISTILLARIA, *Fr.*

Club-shaped, waxy, then horny. Structure cellular.

1. *P. micans*, *Fr.*; obovate, obtuse, rose-coloured; stem short, attenuated, whitish.—*Hoffm. Germ. t.* 7. *f.* 2.

On dead thistles. Rare. Cambridge, etc.

2. *P. culmigena*, *Mont. and Fr.*; ovato-clavate, obtuse, hyaline, pellucid; stem distinct, very short.—*Mont. in Ann. des Sc. Nat. sér. 2. vol. v. t.* 12. *f.* 2.

On stalks of grass. Not uncommon. Fotheringay, Deene, etc., Northamptonshire.

3. *P. quisquiliaris*, *Fr.*; incrassated above, somewhat compressed, dirty-white, soft when growing, attenuated at the base, substipitate.—*Sow. t.* 334. *f.* 1.

On fern-stems. Common. Often attached to a *Sclerotium*.

4. *P. puberula*, *Berk.*; obovate, ventricose, white; stem short, distinct, pellucid, tomentose.—*Sow. t.* 334. *f.* 2. *P. ovata*, *Fr.*

On dead *Pteris aquilina*. Rare. King's Cliffe. The stem in this is composed of fibres; therefore I fear that Fries's character will hardly stand.

5. *P. pusilla*, *Fr.*; small, smooth, even, linear, white; stem not distinct at the base.—*Pers. Comm. t.* 3. *f.* 6.

On *Equisetum*. Weymouth.

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#### ORDER 6. *TREMELLINI*.

Whole plant gelatinous, with the exception occasionally of the nucleus. Sporophores large, simple or divided. Spicules elongated into threads.

#### 45. *TREMELLA*, *Fr.*

Gelatinous, tremulous, immarginate. Hymenium not papillate, surrounding the whole of the Fungus.

1. *T. fimbriata*, *P.*; caespitose, erect, corrugated, olive-black; lobes flaccid, incised, undulato-fimbriate.—*Bull. t.* 272.

On dead branches. Very rare. Sowerby's herbarium.

2. *T. frondosa*, *Fr.*; caespitose, very large, even, pallid, plicate at the base; lobes waved and sinuated.—*Bull. t.* 499 *T.*

At the base of living trees. Very rare. On oak, Wothorpe, Northamptonshire. A very curious and distinct species. Colour a peculiar pale pinkish-yellow.

3. *T. foliacea*, *P.*; cæspitose, flaccid, even, diaphanous, undulated, cinnamon, inclining to flesh-coloured, plicate at the base.—*Bull. t.* 406. *f. A.*

On old stumps. Not uncommon. Varying much in colour, sometimes deep red-brown (*T. ferruginea*, *E. B. t.* 1452), sometimes violet. All the three forms occur occasionally in this country.

4. *T. lutescens*, *Fr.*; cæspitose, tremulous, undulato-gyrose, white, at length yellow; lobes crowded, entire.—*Bull. t.* 406 *C, D.*

On old stumps. Not uncommon.

5. *T. mesenterica*, *Retz*; ascending, rather tough, plicato-undulate, smooth, bright orange.—*Eng. Bot. t.* 709; *Huss. i. t.* 27.

On sticks in woods, hedges, etc. Extremely common.

6. *T. vesicaria*, *Bull.*; firm, bladdery, much waved and wrinkled, erect, pallid, very viscid within.—*Eng. Bot. t.* 2451.

On the ground. Very rare. I have seen no British specimens, but in some from the United States I find the structure of a *Tremella*. It is certainly no Alga, as stated by Fries.

7. *T. moriformis*, *B.*; conglobated, sinuated, mulberry-black, opaque, firm.—*Eng. Bot.* 2446.

On elm-branches. Rare. Batheaston, *C. E. B.* This beautiful species is, I think, a true *Tremella*, approaching, however, to *Næmatelia*. The sporophores do not at all resemble those of *Dacrymyces*.

8. *T. albida*, *Huds.*; effused, adpressed, even or gyroplicate, pruinose, dirty-white, at length brownish.—*Eng. Bot. t.* 2117.

On dead branches. Common.

9. *T. intumescens*, *Sm.*; subcæspitose, rounded or conglomerate, soft, brown, when dry nearly black, obsolete dotted, lobed, somewhat tortuous.—*Eng. Bot. t.* 1870.

On trunks of fallen trees. Not common. Apethorpe, Northamptonshire. Resembles very closely some *Exidia*.

10. *T. indecorata*, *Somm.*; sessile, rounded, moist, convex, plicate, opaque, brown, nearly black, dingy.

On willows, etc. Mossburnford, *A. Jerdon*.

11. *T. sarcoides*, *Sm.*; cæspitose, soft, viscid, flesh-coloured, inclining to purple, at first club-shaped, then compressed, lobed and plicate. (Plate 2, fig. 7.)—*Eng. Bot. t.* 2450.

On old stumps. Very common.

12. *T. clavata*, *P.*; solitary, simple, incrassated, flesh-coloured, blackish at the base.—*Pers. Ic. Pict. t.* 10. *f.* 1.

On stumps. Rare. Appin, *Capt. Carmichael*.

13. *T. tubercularia*, *B.*; crumphant; stem short, cylindrical; head pileate, dirty-white, nearly black when dry.—*Tubercularia albida*, *B. in Eng. Fl. l. c. p.* 354.

On fallen branches. Not uncommon.

14. *T. torta*, *Willd.*; minute, round, depressed, gyrosotuberculate, yellow or orange.

On decorticated oak-branches. Very common. Two or three lines across.

15. *T. versicolor*, *B. and Br.*; minute, orbicular, orange, at length brown.—*Ann. of Nat. Hist. ser. 2. vol. xiii. p.* 406.

On *Corticium nudum*. In several localities. Minute, tear-like, pale when young.

16. *T. viscosa*, *P.*; effused, resupinate, hyaline, at first white, undulated.—*Pers. Obs. ii.* 18. *Corticium viscosum*, *Fr.*

On dead wood. Not uncommon. This has the structure of *Tremella*, as will be seen by the figure in *Ann. of Nat. Hist. xiii. t.* 15. *f.* 4.

17. *T. epigæa*, *B. and Br.*; effused, gelatinous, gyroso-plicate, white.—*Ann. of Nat. Hist. ser. 2. ii. p. 266, with fig.*

On the ground. Rare. Leigh Wood, Bristol. Spreading over the naked soil, on which it forms a thin, white, gelatinous stratum.

#### 46. *EXIDIA*, *Fr.*

Tremulous, margined, fertile above and glandular, barren below.

1. *E. recisa*, *Fr.*; very soft, truncate, plane, costate, somewhat waved, brown amber-colour, rough with little specks below; stem very short, excentric, oblique.—*Eng. Bot. t. 1819.*

On dead branches of willows, often before they fall. Very common.

2. *E. glandulosa*, *Fr.*; effused, flattened, thick, undulated, nearly black, rough with conical papillæ, cinereous, and somewhat tomentose beneath.—*Eng. Bot. t. 2448, 2452; Huss. i. t. 42.*

On dead branches of oak, etc. Common. The under side feels like black crape. Sometimes truncate, sometimes pendulous.

3. *E. saccharina*, *Fr.*; tubercular, gyroso-undulate, thick, tawny-cinnamon, sprinkled with scattered papillæ.

On larch. Rare. Mossburnford, *A. Jerdon.*

#### 47. *HIRNEOLA*, *Fr.*

Gelatinous, cup-shaped, horny when dry. Hymenium often more or less wrinkled; interstices even, without papillæ; outer surface velvety.

1. *H. auricula-Judæ*, *B.*; thin, concave, flexuous, at length black, venoso-plicate without and within, tomentose beneath. (Plate 18, fig. 7.)—*Huss. i. t. 53.*

On elder and elms. Very common. Our figure is from specimens on elms which have the surface of the hymenium freer from folds. I do not, however, consider it a distinct species.

#### 48. NÆMATELIA, Fr.

Nucleus solid, heterogeneous, covered with a gelatinous stratum, which is everywhere clothed with the hymenium.

1. *N. encephala*, Fr.; nearly sessile, pulvinate, plicatoplicate, pale flesh-coloured, then brownish.—*Willd. Bot. Mag.* i. t. 4. f. 14.

On pine-rails. Rare. Loch Lomond. Wales, *Mr. Ralfs*. Looks like the brain of some animal. Nucleus large, opaque, white.

2. *N. nucleata*, Fr.; sessile, flat, somewhat gyrose, white, then brownish-yellow.

On rotten wood. Rare. Sometimes confounded with *Tremella albida*, from which it differs in the presence of a small white nucleus. I see no difference between British and American specimens.

3. *N. virescens*, Cd.; small, roundish, depressed, gyrosotuberculate, or quite even, green.—*Fl. Dan. t.* 1857, f. 1.

On furze-branches. Common.

#### 49. DACRYMYCES, Nees.

Homogeneous, gelatinous. Conidia disposed in moniliform rows. Sporophores clavate, at length bifurcate.

1. *D. violaceus*, Fr.; small, compact, somewhat compressed, gyrose, violet.

On trunks of pear-trees. Rare. *Relhan*.

2. *D. deliquescens*, Duby; pulvinate, slightly waved and plicate, yellow.

On fallen pine-branches. Not uncommon. From a quarter to half an inch across. Spores triseptate.

3. *D. stillatus*, *Nees*; roundish, convex, at first nearly even, at length often concave, deep orange; colour persistent. (Plate 18, fig. 8.)—*Grev. t.* 159.

On pine-rails. Very common. Smaller than the last. Spores multiseptate. Generally barren. *Ditiola nuda*, *B. and Br. Ann. of Nat. Hist. ser. 2. vol. ii. p. 267. t. 9. f. 4.* is probably the fertile state of *D. deliquescens*, not of *D. stillatus*.

4. *D. chrysocomus*, *Tul.*; small, yellow, gelatinous, cup-shaped.—*Peziza chrysocoma*, *Bull. t.* 376. *f.* 2.

On fir-branches. Not common.

#### 50. APYRENIUM, *Fr.*

Stroma gelatinoso-carnose, fibroso-floccose, hollow, inflated. Hymenium smooth, when dry collapse-pubescent.

1. *A. lignatile*, *Fr.*—*Grev. t.* 276.

#### 51. HYMENULA, *Fr.*

Effused, very thin, maculæform, agglutinate, between waxy and gelatinous.

1. *H. punctiformis*, *B. and Br.*; gelatinous, punctiform, pallid, somewhat undulated; spores elliptic.

On decorticated fir-poles. Batheaston, *C. E. B.* Dirty-white or very pale umber, slightly tinged with yellow.

#### 52. DITIOLA, *Fr.*

Orbicular, margined, patellæform. Hymenium discoid, gelatinous, at first veiled.

1. *D. radicata*, *Fr.*; disc nearly plane, golden-yellow; stem thick, villous, white, rooting.—*A. and S. t.* 8. *f.* 6.

On pine-wood. Not common. East Bergholt, *Dr. Badham*. I have never been able to find asci in this plant, which I believe belongs to the Order *Tremellini*.

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FAM. II.—GASTEROMYCETES.

Hymenium more or less permanently concealed, consisting in most cases of closely-packed cells, of which the fertile ones bear naked spores on distinct spicules, exposed only by the rupture or decay of the investing coat or peridium.

ORDER 7. *HYPOGÆI*.

Hymenium permanent, not becoming dusty or deliquescent except when decayed. Subterranean.

53. *OCTAVIANIA*, *Vitt.*

Peridium continuous or cracked, cottony, running down into the sterile base. Trama byssoid, easily divisible. Fruit-bearing cavities or cells at first empty. Spores rough.

1. *O. asterosperma*, *Vitt.*; globose, dirty-white, then in parts æruginous-blue and black; sterile base rather thick; spores spherical, deep ferruginous, echinate.—*Tul. t. 11. f. 1.*

Underground, adhering by the mycelium to twigs, etc. Rare. West of England, *C. E. B.*

2. *O. Stephensii*, *Tul.*; irregular, oblong, externally rufous, plicato-rugose at the base, cribose, white within, milky, at length, when exposed to the air, rufous; spores globose, at length echinulate.—*Hydnangium Stephensii*, *Berk. Ann. of Nat. Hist. xiii. p. 352.*

Underground, or half-buried. Bristol, *C. E. B.* Smell like that of *Lactarius theiogalus*. Adhering by branched fibrous roots.

54. MELANOGASTER, *Cd.*

Peridium adhering to creeping branched fibres which traverse its surface, without any proper or distinct base. Cells at first filled with pulp. Spores smooth, mostly dark.

1. *M. variegatus*, *Tul.*; at first ochraceous, then reddish-ferruginous, minutely downy; walls of the cells dirty-white, yellowish, or orange; pulp black; spores minute.—*Sow. t.* 426.

Under beech-trees, Lombardy poplars, etc. South-west of England. Not common. Sold in the market at Bath under the name of the Red Truffle. British specimens never have the walls of the cells decidedly yellow or orange. *M. Broomeianus*, *B.*, seems, however, to be a mere variety of *M. variegatus*.

2. *M. ambiguus*, *Tul.*; very fetid, globose, dirty-olive, nearly even; walls of cells white, reddish when exposed to the air; pulp black; spores large, obovate.—*Tul. t.* 2. *f.* 5, and *t.* 12. *f.* 5.

Under fir-trees, etc. West of England, *C. E. B.* Apothorpe, Northamptonshire. Smell like that of asafœtida. Spores slightly acute, or more commonly with a terminal papilla. A variety or distinct species, as large as the last, and having its bright rust-colour, occurred at Spye Park, in which the spores have very rarely any papillary apex. This is *M. ambiguus*,  $\beta$  *intermedius*, *B.*

55. HYDNANGIUM, *Wallr.*

Peridium fleshy or membranaceous. Sterile base none. Trama vesicular. Cells at first empty, then filled with spores. Spores echinate.

1. *H. carotæcolor*, *Berk.*; oblong, rootless; peridium thin, rugulose, brick-red, orange within; spores subelliptic, pale, echinulate. (Plate 20, fig. 1.)—*Ann. of Nat. Hist.* xiii. *p.* 351.

Under trees. Bristol, *Dr. Stephens*. Sometimes half exposed, as pointed out to me at Bristol by Mr. Broome and Mr. Thwaites. Colour exactly that of a carrot. Communicating to paper a lemon-coloured stain.

#### 56. HYSTERANGIUM, *Vitt.*

Peridium indehiscent, distinct, separable. Cavities at first empty. Substance cartilagineo-glutinous. Spores minute.

1. *H. nephriticum*, *B.*; depressed, springing from a white, flat, branched, membranous mycelium; peridium firm, elastic, distinct, tomentose; substance pale blue or grey, here and there greenish; cavities radiating from the base; spores minute, oblong, pale clay-colour.—*Ann. Nat. Hist.* xiii. p. 350.

Under trees. Clifton, *C. E. B.* Smell at first like that of some *Hypericum*, then exactly that of a decaying Puff-ball. The spores in the closely allied *H. Pompholyx*, *Tul.*, are rose-coloured.

2. *H. Thwaitesii*, *B. and Br.*; subglobose, white, rufous when bruised; peridium membranaceous; spores oblong apiculate.—*Ann. of Nat. Hist. ser. 2.* ii. p. 267.

Under trees. Bristol, *C. E. B.* Mycelium white, fibrillose. Seldom flattened. Cavities brownish-olive. The hymenium of *Hysterangium* is very like that of a young *Phallus*.

#### 57. RHIZOPOGON, *Tul.*

Peridium continuous or cracked, adhering to creeping branched fibres, which traverse its surface. Cavities distinct, at first empty. Spores smooth, oblong-elliptic.

1. *R. rubeseens*, *Tul.*; white, then reddish, and at length livid-olive, furnished with a few fibrillæ; substance very lacunose, dirty-white, then olive; cavities always empty.

In sandy fir-woods. Chudleigh, *C. E. B.* At first nearly transparent, with white roots, and pink when touched. Smell something like that of *Melanogaster ambiguus* when old, when young like that of sour ham.

### 58. HYMENOGASTER, *Tul.*

Peridium fleshy or thin, running down into an absorbing base. Cavities at first empty, radiating or irregular. Trama composed of elongated cells, but not of byssoid flocci, and therefore not easily separable. Spores various.

1. *H. Klotzschii*, *Tul.*; obovate, fibrillose at the base, dirty-white, within dull rufous-ochre; spores small, elliptic, obtuse at either extremity, nearly even.—*Fl. Regn. Bor. t.* 466.

Amongst soil. Very rare. In the Glasgow Botanic Garden, *Klotzsch.*

2. *H. muticus*, *B. and Br.*; globose, quite white when young, then tinged with brown and cracked, pale yellow-brown within; spores obovate, oblong, very obtuse.—*Ann. of Nat. Hist. ser. 2. ii. p.* 267.

Under trees. Stapleton Grove, Bristol, *C. E. B.* Smell very slight. Spores quite blunt.

3. *H. luteus*, *Vitt.*; peridium very thin, soft and silky, white, then brownish, bright yellow within; spores even, ovate or elliptic, oblong, yellow.—*Tul. t. 1. f.* 3.

In woods. Not uncommon.

4. *H. decorus*, *Tul.*; roundish, dirty-white, here and there yellow, rather firm, within lilac-brown and at length blackish-violet; absorbing base obsolete; sporophores long, somewhat filiform; spores elliptic, obtuse or obtusely apiculate, rugulose, ochraceous, then brown.—*Tul. t. 10. f.* 9.

In woods. Not uncommon. Distinguished readily by the filiform sporophores, which project into the cavities.

5. *H. vulgaris*, *Tul.*; roundish, irregular, dirty-white, soon soiled, softish, within dirty-white, then dark-brown; sterile base minute; spores oblong or lanceolate, oblong-acute, attenuated at the base, dark-brown when mature; surface uneven.

In woods. Bristol, *C. E. B.* Apethorpe.

6. *H. pallidus*, *B. and Br.*; smaller, rounded, depressed, nearly smooth, white, then dirty tan-colour, rather soft, within white, then yellow, then pale brown; sterile base obsolete; spores lanceolate, acute, shortly pedicellate, rather rough.—*Ann. of Nat. Hist.* xviii. p. 74.

In a dry fir-plantation. Cotterstock, Northamptonshire. About size of horse-bean. Resembling somewhat *H. luteus*.

7. *H. citrinus*, *Vitt.*; rounded, gibbous, shining as if silky, lemon-coloured or golden-yellow, then rufous-black, of the same colour within; substance firm; spores lanceolate, apiculate, rugulose, reddish-brown, opaque. (Plate 20, fig. 2.)

In woods. Not uncommon. Smell strong, cheese-like. Sporophores often deeply coloured.

8. *H. olivaceus*, *Vitt.*; globose, but angular; peridium whitish, then tinged with yellow, rufous when bruised; substance white, then of a dull buff, then rufous-olive, variegated with the white trama; spores pedicellate, mucronate, generally smooth.—*Vitt. t.* 5. f. 9.

In woods. Common in the west of England. Smell like that of *Lactarius theiogalus*, and in some specimens of *Ag. gambosus*.

9. *H. tener*, *B.*; small, globose, soft, white, silky; substance pale pink, then greyish-umber; sterile base conspicuous, white; spores broadly elliptic, with a papillary apex, minutely warty.—*Ann. of Nat. Hist.* xiii. p. 349.

In woods. Not uncommon. Hazlebeece, Northamptonshire, *C. E. B.* Common in the West of England. Smell strong, pungent.

10. *H. Thwaitesii*, *B. and Br.*; small, globose, firm, dirty-white, here and there stained; substance brown; spores globose, rather rough, papillary.—*Ann. of Nat. Hist.* xiii. p. 349.

In woods. Very rare. Portbury, near Bristol, *G. H. K. Thwaites*. Spores more globose than in any other species, mixed however with a few which are oblong, larger than in *H. tener*, but smaller than in *H. decorus*. Interior membrane often contracted.

11. *H. pusillus*, *B. and Br.*; very small, obovate or subdepressed, white; sterile base large; substance dirty-white; cells large; spores pallid-rubiginous, short, broadly elliptic, with a papillary apex, at length rough.—*Ann. of Nat. Hist.* xviii. p. 75.

On mossy ground, in woods. Rushton, Northamptonshire. About 2 lines high. Almost scentless, not turning black like the last when dry. Cavities larger.

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#### ORDER 8. PHALLOIDEI.

Volva universal, the intermediate stratum gelatinous. Hymenium deliquescent.

#### 59. PHALLUS, *L.*

Pileus perforated at the apex, free all round, reticulate. Veil none.

1. *P. impudicus*, *L.*; pileus conical, reticulated; borders of the reticulations nearly entire; stem white. (Plate 20, fig. 3.)—*Grev. t.* 213.

In woods. Extremely common in some districts, but local. Smell very fetid.

2. *P. iosmos*, *B.*; pale reddish-grey; pileus conical, reticulated; borders of the reticulations strongly toothed.—*Curt. Brit. Ent.* x. t. 469.

Sandhills. Lowestoft. I have seen no fresh specimens. Scent somewhat like violets at a distance, but very offensive when the plant is dried.

#### 60. *CYNOPHALLUS*, *Fr.*

Pileus adnate, imperforate, uneven. Veil none.

1. *C. caninus*, *Fr.*—*Sow. t.* 330.

Amongst decayed leaves, in woods. Local. Stem white or pinkish. Root filiform, branched, creeping in every direction.

#### 61. *CLATHRUS*, *Mich.*

Stem none. Receptacle forming an ovate or globose network; branches of the network cellular within.

1. *C. cancellatus*, *L.*; obovate, branches of the receptacle anastomosing obliquely.—*Huss. i. t.* 86.

In woods. South of England and Ireland, as at the Isle of Wight, Torquay, etc. Very beautiful, but extremely fetid. Branches resembling sealing-wax, covered here and there with an olive sporiferous mass.

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#### ORDER 9. *TRICHOGASTRES.*

Peridium single or double. Hymenium at length drying up into a dusty mass of threads and spores.

62. BATARREA, *P.*

Volva universal, central stratum gelatinous. Receptacle pileiform, bursting through the volva, seated at the top of a tall stem.

1. *B. phalloides*, *P.*; stem equal, spores brownish.

On sandhills, or in the hollow of old trees at the base. Rare. New Brighton, *Rev. T. Higgins*. Dropmore, etc. In habit resembling *Phallus*, in structure *Tulostoma*.—*Sow. t.* 390.

63. TULOSTOMA, *P.*

Peridium thin, papyraceous, the outer coat separating, distinct from the elongated stem.

1. *T. mammosum*, *Fr.*; stem equal, somewhat scaly; mouth of the peridium prominent, mammæform, entire.—*Sow. t.* 406.

On old walls, amongst moss. Local. Not uncommon about London. The base of the receptacle is free all round. Stem nearly of the same texture as in *Batarrea*.

64. GEASTER, *Mich.*

Peridium double, outer distinct, persistent, bursting, and divided into several stellate lobes.

1. *G. coliformis*, *P.*; outer peridium multifid, expanded; inner supported by many slender short stems; apertures numerous, ciliated.—*Sow. t.* 313.

On the ground. Local. Scarcely found except in Norfolk and Suffolk. One of the largest of the genus.

2. *G. fornicatus*, *Fr.*; outer peridium subquadrifid, separating into two coats, connected at the tips of the divisions, and vaulted; mouth conical, plicato-sulcate.—*Sow. t.* 198.

On the ground, and in the cavity of hollow trees. Not common, though found occasionally in as high a latitude as Nottinghamshire.

3. *G. striatus*, *DC.*; outer peridium multifid, simple, expanded; inner subpedicellate; mouth prominent, conical, sulcato-striate.

Amongst sand. Abundant at Yarmouth.

4. *G. Bryantii*, *B.*; outer peridium, coriaceous, expanded, multifid; inner pedicellate, with a groove round the top of the peduncle; mouth sulcato-plicate.

Under yew-trees, and on exposed fen-banks. Not common. Apethorpe, Northamptonshire. Thorney, Cambridgeshire.

5. *G. limbatus*, *Fr.*; outer peridium coriaceous, expanded, multifid; inner pedicellate; mouth fimbriato-pilose, depressed, rather acute.—*Sow. t.* 312; *Huss. i. t.* 2.

On the ground. Not common. There is no groove round the top of the stem, as in the last.

6. *G. fimbriatus*, *Fr.*; outer peridium multifid, expanded, flaccid; inner sessile; mouth indeterminate, piloso-fimbriate. (Plate 20, fig. 4.)—*Sow. t.* 80.

In fir-plantations. Not uncommon. Sowerby's plant is certainly the same as this, the mouth not being simply toothed, as in *G. rufescens*. The figure in Plate 20 does not sufficiently show the true character of the aperture.

7. *G. mammosus*, *Chev.*; outer peridium multipartite, rigid, hygrometric; laciniae equal; inner sessile; mouth ciliate, acutely conic, in a circular disc.—*Sow. t.* 401.

On the ground. Extremely rare. I have seen only the specimen figured by Sowerby.

8. *G. rufescens*, *P.*; outer peridium multifid, at length revolute; inner sessile, naked; mouth toothed.

In pastures. Bardon Hills, Leicestershire. Northampton-

shire. My plant has an irregular toothed mouth. An authentic specimen of Persoon is *G. fimbriatus*, and so perhaps are some of Schmidel's figures.

9. *G. hygrometricus*, *P.*; outer peridium multipartite, thick, rigidly inflexed when dry; inner sessile, subreticulate, bursting irregularly.—*Bolt. t.* 179.

On the ground. Very rare. Swain's Moor, near Halifax. The hard, horny outer peridium, and scurfy or reticulate, irregularly bursting inner peridium, readily distinguish this species, which, though so rare here, is common on the Continent.

#### 65. BOVISTA, *Dill.*

Peridium like paper (or pasteboard), persistent. Bark distinct, at length shelling off. Capillitium equal, attached on all sides to the peridium. Spores pedicellate.

1. *B. nigrescens*, *P.*; subglobose; peridium tough, paper-like, at length blackish-umber; bark even, entirely evanescent; capillitium thick, purple-brown, as well as the spores. (Plate 20, fig. 5.)

In pastures. Very common. Larger than the next.

2. *B. plumbea*, *P.*; globose; peridium paper-like, flexible, lead-coloured; bark persistent at the base; mouth narrow; capillitium and spores brown. (Plate 20, fig. 6.)

In pastures. Even more common than the last.

#### 66. LYCOPERDON, *Tourn.*

Peridium membranaceous, vanishing above or becoming flaccid. Bark adnate, subpersistent, breaking up into scales or warts. Capillitium adnate to the peridium and to the sterile base.

1. *L. giganteum*, *Batsch*; peridium very brittle above and obtuse, cracking into areæ, evanescent, very widely open; bark floccose, rather distinct; capillitium vanishing, together with the dingy-olive spores.—*Grev. t.* 336; *Huss. i. t.* 26.

In pastures. Local. Esculent when young. Attaining sometimes a very large size. Used as an anæsthetic.

2. *L. cælatum*, *Fr.*; peridium flaccid above, collapsing, obtuse, dehiscent at the apex, at length open and cup-shaped; barren stratum cellular; inner peridium distinct all round; spores dingy-yellow. (Plate 20, fig. 7.)—*Huss. ii. t.* 23.

In pastures, etc., often forming rings. Very common and variable.

3. *L. atro-purpureum*, *Vitt.*; peridium flaccid, dingy-rufous, opening by a minute obtuse mouth; bark at first rough with minute spines; sterile base cellular, continuous with the capillitium; spores largish, pedicellate, brown-purple, echinulate.—*Vitt. Mon. t.* 2. *f.* 6.

On downs. West of England, *C. E. B.*

4. *L. pusillum*, *Fr.*; peridium entirely flaccid, persistent, obtuse, always bursting by a narrow mouth; bark even, then rimose with adpressed scales; sterile stratum obsolete, continuous with the capillitium; spores olive.—*Bolt. t.* 117. *f.* *C.*

In pastures. Not common. Lea, Lincolnshire, etc. A small species.

5. *L. saccatum*, *Vahl*; peridium lens-shaped, scurfy, obtuse, cracking into areæ, fugacious, very thin, as well as the adnate bark; capillitium compact, persistent; spores dingy-umber.—*Huss. i. t.* 14.

In thickets, or on their borders. Rare. Kent. Bath. Laxton, Northamptonshire. Peridium plicate beneath.

6. *L. gemmatum*, *Fr.*; peridium membranaceous, persistent, narrowed at the base, opening with an umbonate mouth

bark farinaceous, adnate, covered with more or less spinulose warts; flocci forming a sort of columella; spores yellow, inclined to green.—*Huss. i. t. 54.*

In meadows, etc. The commonest species of the genus, and very variable.

7. *L. pyriforme*, *Schæff.*; peridium membranaceous, persistent, somewhat pyriform, umbonate; bark innate, covered with minute fugacious scales; columella conical, greenish-yellow, as well as the spores.—*Huss. i. t. 70; Grev. t. 304.*

On decayed stumps, etc. Common. Root white, branched, creeping.

#### 67. SCLERODERMA, *P.*

Peridium firm, with an innate bark, bursting irregularly. Flocci adhering on all sides to the peridium, and forming distinct veins in the central mass. Spores large, granulated.

1. *S. vulgare*, *Fr.*; nearly sessile, irregular; peridium hard, corky, bursting by an indefinite aperture; inner mass bluish-black; spores dingy. (Plate 15, fig. 4, in part.)—*Huss. i. t. 17.*

On the borders of woods, etc. Common. Peridium variously areolate, warty or scaly, sometimes nearly even.

2. *S. Bovista*, *Fr.*; nearly sessile, irregular; peridium thin, soft, bursting irregularly; bark inclining to peel off; flocci yellow; spores dingy-olive.

On sandy ground. Not common. Known by its thinner peridium and yellow flocci.

3. *S. verrucosum*, *P.*; somewhat stipitate; peridium rounded, somewhat warty, thin above and brittle; central mass purple-black; spores and flocci brown.—*Grev. t. 48; Huss. i. t. 17.*

On sandy ground, etc. Not uncommon. Care must be

taken not to confound this with stipitate forms of the two foregoing species.

### 68. POLYSACCUM, DC.

Common peridium simple, rigid, bursting irregularly; internal mass divided into distinct cells, filled with peridiola. Spores mixed with threads.

1. *P. olivaceum*, Fr.; peridium roundish, olive, as well as the regular minute peridiola; stem short, abrupt, almost rootless.—*Sow. t.* 425 *a, b.*

On the ground (not on sandhills). Extremely rare. Highgate. I have seen no specimen, and am therefore uncertain whether it is really distinct from *P. pisocarpium*.

### 69. CENOCOCCUM, Fr.

Peridium naked, thick, carbonaceous, indehiscent, at length hollow, with the walls dotted with dust-like spores.

1. *C. geophilum*, Fr.; black; spores of the same colour.—*Sow. t.* 270.

In woods, where the soil is peaty. Common. About the size of a vetch. The proper situation of this genus is very doubtful.

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## ORDER 10. MYXOGASTRES.

At first pulpy, at length filled with flocci and dust-like spores.

### 70. LYCOGALA, Mich.

Peridium composed of a double membrane, papyraceous,

persistent, bursting irregularly at the apex, externally warty or furfuraceous. Flocci delicate, adnate to the peridium.

1. epidendrum, *Fr.*; *Grev. t.* 38. On decayed wood.\*
2. parietinum, *Fr.*; *Schrad. Nov. Gen. t.* 6. *f.* 1; (*no.* 381). On damp paper, basket-work, etc.

### 71. RETICULARIA, *Bull.*

Peridium indeterminate, simple, thin, naked, bursting irregularly, fugitive. Flocci attached to the peridium, flat, branched, subreticulate.

1. maxima, *Fr.* On felled trees.
2. atra, *Fr.*; *Sow. t.* 257. On felled pines.
3. umbrina, *Fr.* (Plate 20, fig. 5.) *Sow. t.* 272. On old rails, etc.

\* Specific characters are given of those species only which can be readily made out with nothing more than a common lens. A mere list is appended of the smaller species, a full account of which, or a reference to where such an account exists, will be found either in the 'English Flora' or in Taylor's Journal, the number in that Journal being indicated where the plant is not contained in the first-mentioned work. The place of each number in the Journal may be found from the following schedule:—

Mag. of Zool. and Bot. vol. i. p. 42 :	no. 1-37.
„ „ „ vol. i. p. 507 :	no. 38-58.
Ann. of Nat. Hist. ser. 1. vol. i. p. 198 :	no. 59-107.
„ „ „ vol. i. p. 257 :	no. 108-137.
„ „ „ vol. vi. p. 355 :	no. 138-207.
„ „ „ vol. vi. p. 430 :	no. 208-256.
„ „ „ vol. xiii. p. 340 :	no. 257-322.
„ „ ser. 2. vol. ii. p. 259 :	no. 323-379.
„ „ „ vol. v. p. 365 :	no. 380-437.
„ „ „ vol. v. p. 455 :	no. 438-501.
„ „ „ vol. vii. p. 95 :	no. 502-537.
„ „ „ vol. vii. p. 176 :	no. 538-614.
„ „ „ vol. ix. p. 317 :	no. 615-639.
„ „ „ vol. ix. p. 377 :	no. 640-661.
„ „ „ vol. xiii. p. 396 :	no. 662-729.
„ „ „ vol. xiii. p. 458 :	no. 730-784.
„ „ ser. 3. vol. iii. p. 356 :	no. 785-900.

72. *ÆTHALIUM*, *Lk.*

Peridium indeterminate, externally covered by a floccose evanescent bark, cellular within from the confluent interwoven flocci.

1. *septicum*, *Fr.* In woods, on various substances.
2. *vaporarium*, *Fr.*; *Grev. t.* 272. In stoves, on bark.

73. *SPUMARIA*, *P.*

Peridium indeterminate, simple, crustaceous, flocculoso-cellular. Spores surrounded by membranaceous, ascending, often sinuous folds.

1. *alba*, *DC.*; *Grev. t.* 267. On living culms of grass, etc.

74. *DIDERMA*, *P.*

Peridium double; external, distinct, crustaceous, smooth; internal delicate, evanescent, attached to the straggling flocci, with or without a columella.

1. *floriforme*, *P. Syn. p.* 165; *Bull. t.* 371. On decayed wood, etc.
2. *umbilicatum*, *P. l. c.*; *Fl. Dan.* 1972. *f.* 1. On dead bark, etc.
3. *citrinum*, *Fr.*; *Fl. Dan.* 1312. *f.* 1. On *Sphagnum*.
4. *vernicosum*, *P. Obs. t.* 3. *f.* 7; *Grev. t.* 111. On dead leaves, etc.
5. *spumarioides*, *Fr.*; *Fl. Dan.* 1798. *f.* 2. On moss, dead leaves, etc.
6. *Trevelyani*, *Fr.*; *Grev. t.* 132. On mosses.
7. *Carmichaelianum*, *B. in Engl. Fl. l. c. p.* 311. On mosses.
8. *nitens*, *Klotzsch*; *Engl. Fl. l. c.* On bark.
9. *globosum*, *Fr.*; *Grev. t.* 122. On dead leaves.
10. *cyanescens*, *Fr.* On dead and living leaves.
11. *deplanatum*, *Fr.* On dead oak-leaves, etc.
12. *contextum*, *P. Obs. i. p.* 89; *Ditm. in Sturm, i. t.* 39; (*no.* 109). On dead grass, fern, etc.

75. DIDYMIUM, *Schrad.*

Peridium scaly or floccose, bursting irregularly.

1. melanopus, *Fr.* (no. 382), and  $\beta$ clavus (no. 110). On various substances.
2. hemisphaericum, *Fr.*; *Sow. t.* 12. On dead twigs, etc.
3. furfuraceum, *Fr.* (no. 734). On dead leaves.
4. tigrinum, *Fr.*; *Schrad. t.* 6. *f.* 2, 3; (no. 383). On decayed wood.
5. squamulosum, *A. and S. t.* 4. *f.* 5. On dead leaves, etc.
6. farinaceum, *Fr.*; *Schrad. t.* 5. *f.* 6. On dead leaves, etc.
7. nigripes, *Fr.*; *Ditm. t.* 42. On rotten wood.
8. pertusum, *B. Eng. Fl. l. c. p.* 313. On dead herbaceous stems.
9. xanthopus, *Fr.*; *Ditm. t.* 43; (no. 111). On dead leaves.
10. leucopus, *Fr.*; *Lk. Diss. i. p.* 27. On dead leaves, etc.
11. Sowerbeii, *B.*; *Sow. t.* 412. *f.* 3. On a decaying bulb.
12. lobatum, *Nees, Syst. f.* 104. On mosses.
13. congestum, *B. and Br.* (no. 384). On dead leaves, grass, etc.
14. dædaleum, *B. and Br.* (no. 385). In a cucumber-frame.
15. physaroides, *Fr.* On dead wood, mosses, etc.
16. cinereum, *Fr.*; *Batsch, f.* 169. On various decaying substances.
17. serpula, *Fr.* On dead leaves.

76. PHYSARUM, *P.*

Peridium simple, membranaceous, very delicate, naked, quite smooth, bursting irregularly. Columella none.

1. nutans, *P.*, and  $\gamma$  aureum, *Grev. t.* 124. On decayed wood.
2. bulbiforme, *Schum.*; *Fl. Dan. t.* 1974. *f.* 3. On rotten wood.
3. rubiginosum, *Chev.*; *Fl. Par. p.* 333. On bark, amongst moss.
4. lilacinum, *Fr.* (no. 215). On decayed wood.
5. metallicum, *B.* (no. 29, with a figure). On elder-sticks.
6. album, *Fr.*; *Grev. t.* 40. On dead leaves, etc.
7. atrum, *Fr.* (no. 216). On fallen oak-branches, etc.

77. ANGIORIDIUM, *Grev.*

Peridium membranaceous, opening by a longitudinal fis-

sure. Flocci adhering to the peridium on all sides, reticulate, flat, ending above in the inner peridium.

1. *sinuosum*, *Grev. t.* 310. On dead leaves, etc.

#### 78. BADHAMIA, *B.*

Peridium naked or furfuraceous. Spores in groups, enclosed at first in a hyaline sac.

1. *hyalina*, *B.* *Physarum hyalinum*, *P. Disp. t.* 2. *f.* 4. On decayed wood.
2. *utricularis*, *B.* *Physarum utriculare*, *Fr. ; Bull. t.* 417. *f.* 1.
3. *nitens*, *B. in Trans. Linn. Soc. xxi. p.* 153 (*no.* 731). On decayed wood.
4. *pallida*, *B. l. c.* (*no.* 732). On decayed wood.
5. *fulvella*, *B. l. c. p.* 154 (*no.* 733). On decayed wood.

#### 79. CRATERIUM, *Trent.*

Peridium simple, papyraceous, rigid, persistent, closed at first with a deciduous operculum. Flocci congested, erect.

1. *pedunculatum*, *Trent ; Ditm. l. c. t.* 9. On dead twigs, etc.
2. *pyriforme*, *Ditm. l. c. t.* 10. On dead leaves, etc.
3. *minutum*, *Fr. ; Sow. t.* 239. On dead leaves, etc.
4. *leucocephalum*, *Ditm. l. c. t.* 11 ; *Grev. t.* 65. On dead leaves, etc.
5. *mutabile*, *Fr.* On bark, moss, etc.

#### 80. DIACHEA, *Fr.*

Peridium very delicate, simple, falling off in fragments. Capillitium subreticulate, springing from a grumous, pallid columella.

1. *elegans*, *Fr. ; Bull. t.* 502. *f.* 2 ; (*no.* 112). On dead leaves, etc.

#### 81. STEMONITIS, *Gled.*

Peridium very delicate, simple, evanescent. Capillitium reticulate, springing from the dark, penetrating stem.

1. fusca, *Roth*; *Grev. t.* 170. On old stumps, etc.
2. ferruginca, *Ehrb. Silv. Ber. f.* 6 *A, B.* On old stumps, etc.
3. typhoides, *DC.*; *Batsch, f.* 176; (*no.* 113). On dead leaves, etc.
4. ovata, *P.*; *Fl. Dan. t.* 2091. *f.* 1; *Sow. t.* 259. On old wainscotting, etc.
5. obtusata, *Fr.*; *Fl. Dan. t.* 2091. *f.* 2. On dead wood.
6. pulchella, *Bab.* (*no.* 217, *with a figure*). On dead *Pteris aquilina*.
7. Physaroides, *A. and S. t.* 2. *f.* 8 (*no.* 386). On mossy stumps.
8. violacea, *Fr.* (*no.* 387). On moss.
9. arcyrrioides, *Somm.* (*no.* 114). On dead laurel-leaves.

### 82. ENERTHENEMA, *Bowm.*

Peridium very delicate, simple, evanescent, except at the apex, where it is adnate with the dilated top of the penetrating dark stem. Capillitium dependent, attached to the dilated disc. Spores surrounded by a cyst.

1. elegans, *Bowm. in Linn. Tr. xvi. t.* 16. (Plate 1, fig. 6 c.) Stemonitis papillata, *P.* On decayed wood.

### 83. DICTYDIUM, *Schrad.*

Peridium simple, very delicate, reticulated or veined from the innate capillitium.

1. umbilicatum, *Schrad.*; *Grev. t.* 153. On pine-stumps.

### 84. CRIBRARIA, *Schrad.*

Peridium simple, persistent below, vanishing above. Flocci innate, forming a free network in the upper half of the peridium.

1. intermedia, *B.*; *Sow. t.* 400. *f.* 5. On rotten wood.

85. ARCYRIA, *Hill.*

Peridium simple, upper portion very fugacious. Capillitium elastic. Flocci not spiral.

1. punicea, *P.*; *Sow. t.* 49; *Grev. t.* 130. On decayed wood.
2. incarnata, *P.*; *Obs. t.* 5. *f.* 4, 5. On decayed wood.
3. cinerea, *Schum.*; *Bull. t.* 477. *f.* 3. On decayed wood.
4. nutans, *Fr.*; *Sow. t.* 260; *Grev. t.* 309. On decayed wood.
5. umbrina, *Schum.*; *Fl. Dan. t.* 1975. *f.* 1; (no. 389). On decayed wood.
6. ochroleuca, *Fr.*; *Ditm. l. c. t.* 8; (no. 115). On decayed wood.

86. OPHIOTHECA, *Curr.*

Peridium simple, bursting longitudinally. Capillitium two-fold, one consisting of delicate hyaline threads, to which the spores are attached; the other of echinulate, thicker, branched filaments.

1. chrysosperma, *Curr. Mic. Journ. ii. p.* 240. *t.* 9.

87. TRICHIA, *Hall.*

Peridium simple, persistent, membranaceous, bursting irregularly above. Threads spiral.

1. rubiformis, *P.*; *Disp. t.* 4. *f.* 3. *T. Neesiana, Cd.*; (no. 218). On dead wood.
2. pyriformis, *Hoffm. Veg. Crypt. t.* 1. *f.* 1. On decayed wood.
3. Ayresii, *B. and Br.* (no. 390). On decayed wood.
4. Lorinseriana, *Cd. Fasc. i. f.* 288; *Currey, in Mic. Journ. v. p.* 129.
5. scrotina, *Schrad.*; *Journ. Bot. 1799. t.* 3. *f.* 2; (no. 391). On decayed wood.
6. fallax, *P.*; *Obs. t.* 3. *f.* 45. On decayed wood.
7. clavata, *P.*; *Sow. t.* 400. *f.* 6. On decayed wood.
8. cerina, *Ditm. l. c. t.* 25; *Currey, l. c. p.* 127. On decayed wood.
9. nigripes, *P.*; *Currey, l. c. p.* 128.
10. turbinata, *With.*; *Sow. t.* 85. On decayed wood.

11. *chryso sperma*, DC. ; *Grev. t.* 281. On decayed wood.
12. *varia*, P. ; *Batsch, f.* 171. On decayed wood.
13. *serpula*, P. ; *Grev. t.* 266. On dead leaves, etc.

#### 88. PERICHÆNA, Fr.

Peridium simple, submembranaceous, persistent, naked, often splitting horizontally in the middle. Flocci few, not spiral.

1. *abietina*, Fr. ; *Sow. t.* 258. On decaying fir-wood.
2. *populina*, Fr. ; *Grev. t.* 252. On decaying poplar.

#### 89. LICEA, Schrad.

Peridium thin, membranaceous, even, bursting irregularly. Spores not mixed with flocci.

1. *cylindrica*, Fr. ; *Sow. t.* 199. On soft rotten wood.
2. *fragiformis*, Fr. ; *Grev. t.* 308. On soft rotten wood.
3. *applanata*, B. (*no.* 292). On sticks.
4. *perreptans*, B. ; *Sow. t.* 400. *f.* 1 ; (*no.* 392). On hotbeds.

#### 90. PHELONITIS, Chev.

Peridium paper-like, persistent, commonly splitting horizontally in the centre. Spores large, rough.

1. *strobilina*, Fr. ; *Grev. t.* 275. On fallen fir-cones.

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#### ORDER 11. NIDULARIACEI.

Spores produced on sporophores compacted into one or more globose or disciform bodies, contained within a distinct peridium.

#### 91. CYATHUS, P.

Peridium composed of three closely connected membranes,

at length bursting at the apex, and closed by a white membrane. Sporangia plane, umbilicate, attached to the walls by an elastic cord.

1. *striatus*, *Hoffm.*; obovate, truncate above and below, externally ferruginous, hairy, within lead-coloured, smooth, striate. (Plate 2, fig. 3.) On sticks, fir-cones, etc. Not uncommon.
2. *vernicosus*, *DC.*; bell-shaped, narrow at the base, nearly sessile, quite even, externally ochraceous or cinereous, minutely downy, at length smooth, within lead-coloured or brown. (Plate 21, fig. 1.) On the ground, especially in stubble-fields. Common.

#### 92. CRUCIBULUM, *Tul.*

Peridium consisting of a uniform, spongy, fibrous felt, closed by a flat furfuraceous cover of the same colour. Sporangia plane, attached by a long cord, springing from a little nipple-like tubercle.

1. *vulgare*, *Tul.* (Plate 2, fig. 1.) On fern, sticks, etc. Not uncommon.

#### 93. SPHÆROBOLUS, *Tode.*

Peridium double; the inner at length inverted elastically, and ejecting a solitary subglobose sporangium.

1. *stellatus*, *Tode*; globose, pale yellow; mouth regular, stellato-dentate. (Plate 21, fig. 2.) On sawdust, twigs, etc. Not uncommon.

#### 94. POLYANGIUM, *Lk.*

Peridium subhemispherical, hyaline. Sporangia large in proportion, grumous within.

1. *vitellinum*, *Ditm. l. c. t. 27.* On fallen trunks. Very rare. King's Cliffe.

*Attractobolus ubiquitarius* is simply the eggs of some *Rhizopignathus*; *Myriococcum* and *Thelebolus* were introduced into

the 'English Flora' on the authority of Loudon, but it is not certain that they were ever found in Great Britain.

FAM. III.—CONIOMYCETES.

Spores either solitary or concatenate, produced on the tips of generally short threads, which are either naked or contained in a perithecium, rarely compacted into a gelatinous mass.\*

ORDER 12. SPHÆRONEMEI.

Perithecium more or less distinct.

95. CONIOTHYRIUM, *Cd.*

Perithecium membranaceous, bursting irregularly or transversely. Spores simple, at length free.

1. *glomeratum*, *Cd. Fasc. 4. f. 108 (no. 752)*. On elm planks.

96. LEPTOSTROMA, *Fr.*

Perithecium membranaceous, flat, breaking off at the base. Spores simple, minute.

1. *caricinum*, *Fr. ; Obs. ii. t. 7. f. 4*. On dead sedges.
2. *juncinum*, *Fr. (no. 108)*. On dead rushes.
3. *filicinum*, *Fr. ; Sow. t. 394. f. 10*. On dead *Pteris aquilina*.
4. *litigiosum*, *Desm.* On dead *Pteris aquilina*.
5. *Spirææ*, *Fr.* On dead *Spiræa Ulmaria*.
6. *vulgare*, *Fr. (no. 205)*. On various dead herbaceous plants.

97. PHOMA, *Fr.*

Perithecium punctiform or subglobose, often spurious or

\* The spores are the prominent feature of this family, and not the threads, as in the following.

incorporated with the matrix, discharging the minute simple spores by a small orifice at the apex. Spores mostly hyaline.

\* *Spores slightly coloured.*

1. concentricum, *Desm.* (no. 197). On leaves of *Yucca* and *Agave*.
2. *Hederæ*, *Desm.* (no. 350). On dead ivy-stems.

\*\* *Spores hyaline.*

3. asteriscus, *B. and Br.* (no. 394). On dead stems of *Hieracleum*.
4. nothum, *B. and Br.* (no. 395). On dead plane-twigs.
5. lingam, *Desm.* no. 1877 (no. 395). On old cabbage-stalks.
6. radula, *B. and Br.* (no. 396). On dead plane-twigs.
7. depressum, *B. and Br.* (no. 397). On twigs of *Robinia Pseudacacia*.
8. eriophorum, *B. and Br.* (no. 812). On decaying chestnuts.
9. samarorum, *Desm.* no. 349 (no. 398). On dead ash samara.
10. piceum, *B. and Br.* (no. 399). On rose-leaves.
11. sticticum, *B. and Br.* (no. 400). On dead box-twigs.
12. exiguum, *Desm.* (no. 1869). On dead elder-shoots.
13. devastatrix, *B. and Br.* (no. 813). On *Lobelia*.
14. microscopicum, *B. and Br.* (no. 401). On *Potamogeton*.
15. nebulosum, *B.* = *Sp. nebulosa*, *P.* On dead herbaceous stems.
16. longissimum, *B.* = *Sp. longissima*, *P.* On dead stems, *Umbelliferæ*, etc.

\*\*\* *On bleached wood.*

17. inophilum, *B.* (no. 735). On maple planks.
18. muciferum, *B.* (no. 736). On elm planks.
19. ulmicola, *B.* (no. 737). On elm planks.
20. epileucum, *B.* (no. 738). On pine planks.
21. fibricola, *B.* (no. 739). On pine planks.
22. bicuspidatum, *B.* (no. 740). On pine planks.

### 98. LEPTOTHYRIUM, *Kze.*

Perithecium flat, irregular, at length breaking off at the base. Spores cylindrical-oblong or irregular.

1. Juglandis, *Lib.* no. 164 (no. 402). On walnut-leaves.
2. Fragariæ, *Lib.* (no. 162). On strawberry and *Potentilla*.
3. Ribis, *Lib.* (no. 258). On leaves of red currant.

### 99. ACTINOTHYRIUM, *Kze.*

Perithecia orbicular, radiato-fibrous. Spores fusiform, slender, simple.

1. graminis, *Kze.*; *Grev. t.* 218. On dead grass.

### 100. CRYPTOSPORIUM, *Kze.*

Perithecium always covered by the cuticle, carnosomembranaceous, at length pierced. Spores fusiform, simple.

1. Caricis, *Cd.* (no. 403). On sedge-leaves.
2. Neesii, *Cd.* (no. 404). On birch-twigs.

### 101. SPHÆRONEMA, *Tode.*

Perithecia free, opaque or hyaline. Spores minute, at length oozing out by the ostiolum, and forming a globule.

1. subulatum, *Tode*; *Grev. t.* 189. On dead *Lactarii*.
2. vitreum, *Cd.* S. blepharistoma, *B.* (no. 57, with a fig., 196). On dead *Lactarii* and nettles.
3. leucoconium, *B. and Br.* (no. 405). On decayed beet.
4. epimyces, *B.* Sphæria epimyces, *Ehb.* (no. 187). On *Corticia*.

### 102. AOSPHÆRIA, *B.*

Perithecia at length free, distinct from the matrix, furnished with a papillæform ostiolum. Spores minute.

1. acuta, *B.* Sphæria acuta, *Hoffm.* On dead nettles.
2. complanata, *B.* S. complanata, *Fr. in part.* On dead stems.

103. SPHÆROPSIS, *Lév.*

Perithecia distinct, carbonaceous. Spores various, simple, escaping by a perforation at the apex.

1. atro-virens, *Lév.* On dead mistletoe-twigs.
2. Candollii, *B. and Br.* Sphæria Buxi, *DC.* On dead box-leaves.
3. leucostigma, *Lév.* (no. 420). *S. Hederae, Sow.* On dead ivy-leaves.
4. cylindrospora, *Desm.* (no. 418). On dead ivy-leaves.
5. Ralfsii, *B. and Br.* (no. 419). On dead ivy-leaves.
6. parca, *B. and Br.* (no. 420\*). On dead leaves of *Abies excelsa.*
7. Strobi, *B. and Br.* (no. 421). On dead leaves of *Pinus Strobus.*
8. geniculata, *B. and Br.* (no. 422). With the last.
9. epitricha, *B. and Br.* (no. 423). On *Equisetum palustre.*
10. mutica, *B. and Br.* (no. 424). On elder.
11. menispora, *B. and Br.* (no. 425). On *Typha latifolia.*
12. malorum, *B.* Sphæria malorum, *B. in Eng. Fl.* On decaying apples.
13. arundinacea, *Lév.* = *Sph. arundinacea, Sow.* On dead leaves.
14. Taxi, *B.* On dead yew-leaves.
15. Alismatis, *Curr.; Linn. Tr.* xxii. p. 334. On *Alisma Plantago.*

104. DOTHIORA, *Fr.*

Nucleus slowly developed, gelatinoso-grumous, black, immersed in an erumpent stroma, subcarbonaceous externally, fleshy within, always astomous. Spores pedicellate, obovate, simple.

1. pyrenophora, *Fr.* (no. 199). On twigs of apple.
2. sphæroides, *Fr.* (no. 198). On ash-twigs.

105. CLINTERIUM, *Fr.*

Perithecium erumpent, free, carbonaceous, bursting by fissures at the apex. Nucleus gelatinoso-floccose. Spores simple.

1. obturatum, *Fr.* On leaves of ling.

106. ACROSPERMUM, *Tode.*

Perithecia cylindrical, free. Spores long, asciform, flexuous, erect.

1. compressum, *Tode; Grev. t.* 182. On various dead herbaceous plants, old ropes, etc. Must not be confounded with the very similar eggs of *Crioceris Asparagi*.
2. graminum, *Lib. (no. 164)*. On dead grasses.

107. DIPLODIA, *Fr.*

Perithecia distinct, carbonaceous. Spores uniseptate, escaping by a perforation at the apex.

1. mutila, *Fr. (no. 407)*. On dead poplar-twigs.
2. confluens, *B. and Br. (no. 408)*. On dead twigs of *Daphne Laureola*.
3. cæspitosa, *B. and Br. (no. 409)*. On dead ivy-twigs.
4. vulgaris, *Lév. (no. 410)*. On dead twigs of various trees.
5. ilicicola, *Desm. n. 988 (no. 206)*. On dead holly-twigs.
6. viticola, *Desm. no. 989 (no. 207)*. On dead pine-shoots.
7. paupercula, *B. and Br. (no. 406\*)*. On dead plane-twigs.
8. Cowdellii, *B. and Br. (no. 406)*. On damp cotton.
9. fibricola, *B. (no. 741)*. On planks of Lombardy poplar.\*
10. oospora, *B. (no. 742)*. On bleached willow.
11. tecta, *B. and Br. (no. 411)*. On dead laurel-leaves.
12. consors, *B. and Br. (no. 412)*. On dead laurel-leaves.
13. arbuticola, *Fr. (no. 188)*. On dead leaves of *Arbutus Uva-ursi*.
14. Ilicis, *Curr. l. c. p. 329*. Sph. Ilicis, *Fr.* On holly-leaves.

108. HENDERSONIA, *B.*

Perithecia distinct. Spores 2-multiseptate, escaping by a terminal pore.

1. elegans, *B. (no. 208, with a fig.)*. On dead reeds.
2. macrospora, *B. and Br. (no. 413)*. On twigs of *Philadelphus*.

\* This species occurred also on an elm plank, picked up by Captain Penny in lat. 76° 2' N., long. 96° W

3. *arcus*, *B. and Br.* (no. 413\*). On dead box-twigs.
4. *mutabilis*, *B. and Br.* (no. 414). On dead plane-twigs.
5. *polycystis*, *B. and Br.* (no. 415). On dead birch-twigs.
6. *oreades*, *Dur. and Mont.; Desm.* (no. 1268). On half-dead oak-leaves.
7. *Stephensii*, *B. and Br.* (no. 502). On dead *Pteris aquilina*.
8. *fibriseda*, *B.* (no. 743). On birch planks.

#### 109. DARLUCA, *Cast.*

Perithecia delicate. Spores containing a row of sporidiola, oozing out and forming a tendril.

1. *filum*, *Cast.* On various *Uredines*.
2. *typhoidearum*, *B. and Br.* (no. 417). On dead leaves of *Typha*.
3. *macropus*, *B. and Br.* (no. 416). On dead leaves of *Carices*.

#### 110. VERMICULARIA, *Tode.*

Perithecium thin, mouthless, generally bristly. Spores vermiculate.

1. *dematium*, *Fr.* On dead herbaceous stems.
2. *trichella*, *Grev. t.* 345. On dead ivy-leaves.
3. *atramentaria*, *B. and Br.* (no. 430). On dead potato-stems.
4. *circinans*, *B. in Gard. Chron.* 1857. On skins of the white Nocera onion.

#### 111. DISCOSIA, *Lib.*

Perithecium flat, opening at the base. Spores septate, obliquely aristate at either end.

1. *alnea*, *Lib.* Sp. *artocreas*, *Tode.* On dead leaves.

#### 112. PILIDIUM, *Kze.*

Perithecium scutellæform, smooth, shining, opening irregularly. Spores curved, without any appendages.

1. *acerinum*, *Kze.* On dead sycamore-leaves.

2. carbonaceum, *Lib.* (no. 442). *Cenangium fuliginosum*, *Fr.* Not, however, a good *Pilidium*. On dead willow-twigs.

### 113. MELASMIA, *Lév.*

Peritheccium membranaceous, dehiscant above, rather swollen, at length depressed and rugose, growing in a thin, spot-like, effused receptacle. Spores minute.

1. acerina, *Lév.* (no. 443). On living sycamore-leaves.
2. alnea, *Lév.*; *Grev. t.* 146. *f.* 2. On living alder-leaves.

### 114. PIGGOTIA, *B. and Br.*

Perithecia irregular, very thin, obsolete below, forming by confluence a wrinkled mass, bursting by a lacerated fissure. Spores rather large, obovate, at length tomiparous.

1. astroidea, *B. and Br.* (no. 503). On living elm-leaves.

### 115. SEPTORIA, *Fr.*

Perithecia minute, more or less incorporated with the matrix. Spores oblong and septate, or thread-shaped and continuous, discharged in little tendrils.

\* *Spores septate.*

1. Ulmi, *Kze.*; *Grev. t.* 112. On living elm-leaves.
2. Oxyacanthæ, *Kze.* On living hawthorn-leaves.
3. Aceris, *B. and Br.* (no. 432). On living sycamore-leaves.
4. salicella, *B. and Br.* (no. 746). On willow-twigs.

\* *Spores not septate.*

5. Ægopodii, *Desm.* On living leaves of *Æg. Podagraria*.
6. Lepidii, *Desm.* (no. 431). On living leaves of *Lepidium Smithii*.
7. nodorum, *B.* (no. 433). On joints of nearly ripe wheat-stalks.
8. Hippocastani, *B. and Br.* (no. 434). On living leaves of horse-chestnut.

9. lituus, *B. and Br.* (no. 744). On twigs.
10. Ralfsii, *B. and Br.* (no. 745). On apples.
11. insularis, *B. and Br.* (no. 747). On ivy-leaves.
12. Badhami, *B. and Br.* (no. 748). On living vine-leaves.
13. polygonorum, *Desm.* (no. 749). On living *Polygona*.
14. Convolvuli, *Desm.* (no. 195). On living bindweed.
15. cornicola, *Desm.* (no. 54). On living cornel. (*Hendersonia, Curr.*)
16. heterochroa, *Desm.* no. 1720 (no. 105). Sp. vagans, *Fr.*
17. graminum, *Desm.* (no. 103). On grass.
18. stemmatea, *B.* (no. 192). On living leaves of *Vaccinium Vitis-idea*.
19. Hederæ, *Desm.* (no. 341). Sp. hederæcola, *Fr.* On ivy.
20. Populi, *Desm.* (no. 1731). Sp. frondicola, *Fr.* On poplar.
21. thecicola, *B. and Br.* (no. 424). On capsules of *Polytrichum*.

#### 116. ASCOCHYTA, *Lib.*

Perithecia distinct, delicate. Spores oozing out, uniseptate or simple.

1. Pisi, *Lib.* = *Depazea concava, B.* (no. 194, with a fig.). On pea-pods.
2. pallor, *B.* (no. 193, with a fig.). On living bramble-stems.
3. Dianthi, *B.* (no. 104, with a fig.). On living pink-leaves.
4. rufomaculans, *B.* (*Septoria, in Gard. Chron.* 1854, p. 676). On grasses.

#### 117. CYSTOTRICHIA, *B. and Br.*

Perithecia bursting longitudinally. Sporophores branched, articulated, beset here and there with oblong, uniseptate spores.

1. striola, *B. and Br.* (no. 448, with a fig.). On naked wood.

#### 118. NEOTTIOSPORIA, *Desm.*

Perithecia concealed, with a central perforation. Spores hyaline, crested.

1. caricum, *Desm.* (no. 435). On dead sedge-leaves.

119. **EXCIPULA**, *Fr.*

Perithecia delicate, hispid, open above (excipuliform). Spores hyaline, attenuated, but not appendiculate.

1. *strigosa*, *Fr.* On dead leaves of grass.
2. *macrotricha*, *B. and Br.* (no. 444). On dead furze.
3. *chaetostroma*, *B. and Br.* (no. 445, with a fig.). On old ash-keys.
4. *fusispora*, *B. and Br.* (no. 814, with a fig.). On *Clematis Vitalba*.

120. **DINEMASPORIUM**, *Lév.*

Perithecia open above (excipuliform), delicate, hispid. Spores hyaline, aristate at either extremity.

1. *graminum*, *Lév.* (no. 446). On dead grass.

121. **MYXORMIA**, *B. and Br.*

Perithecium composed of flocci with free apices, open above. Spores concatenate, involved in gelatine.

1. *atro-viridis*, *B. and Br.* (no. 447, with a fig.). On grass.

122. **PROSTHEMIUM**, *Kze.*

Perithecia carbonaceous. Spores fasciculate, fusiform, septate, attached to articulated threads.

1. *betulinum*, *Kze.* On dead birch-twigs.

123. **ASTEROMA**, *DC.*

Perithecia flat, with no determinate orifice, attached to creeping branched threads. Spores simple or uniseptate.

1. *reticulatum*, *B.* On half dead *Convallaria majalis*.
2. *Ulmi*, *Kl.* On living elm-leaves.
3. *Prunellæ*, *Purt.* On living *Prunella vulgaris*.

4. Padi, *Grev.* (no. 201). On living leaves of *Prunus Padus*.
5. Rosæ, *DC.* (no. 202). On living rose-leaves.
6. Veronicæ, *Desm.* no. 778 (no. 55). On living *V. officinalis*.

#### 124. RABENHORSTIA, *Fr.*

Conceptacle thin, subcarbonaceous, cup-shaped, dimidiate, above covered with the adnate cuticle, celluloso-loculose within. Ostiolum simple. Nucleus gelatinous.

1. rudis, *Fr.* On dead twigs of laburnum.
2. Tiliæ, *Fr.* On dead twigs of lime.

#### 125. CYTISPORA, *Fr.*

Perithecia irregular, or compound and radiating. Spores minute, mostly curved, oozing out from a common apex in the form of globules or tendrils.

1. rubescens, *Fr.* On dead twigs of *Rosaceæ*.
2. chrysosperma, *Fr.* On dead poplar.
3. carphosperma, *Fr.* On dead twigs of *Rosaceæ*.
4. leucosperma, *P.* On various trees.
5. fugax, *Fr.* On dead willows.
6. Hendersonii, *B. and Br.* (no. 436). On twigs of *Rosa arvensis*.
7. Pinastris, *Fr.* On fallen pine-leaves.
8. guttifera, *Fr.* On dead willow-twigs.

#### 126. MICROPERA, *Lév.*

Perithecia innate, membranaceous, gaping above, without any common ostiolum. Spores simple, linear.

1. drupaccarum, *Lév.* (no. 437). On dead branches of cherry.

#### 127. DISCELLA, *B. and Br.*

Perithecium spurious, nearly simple, sometimes obsolete

above or entirely wanting, and hence excipuliform. Spores elongated, simple or uniseptate.

1. carbonacea, *B. and Br.* (no. 426, with a fig.). On dead willow twigs.
2. Desmazierii, *B. and Br.* (no. 427, with a fig.). On dead lime-twigs.
3. platyspora, *B. and Br.* (no. 428). On dead plane-twigs.
4. microsperma, *B. and Br.* (no. 429, with a fig.). On dead willow-twigs.
5. abnormis, *B. and Br.* (no. 429\*). On dead elder shoots.

### 128. PHLYCTÆNA, *Desm.*

Perithecium spurious, simple, never deficient above. Spores elongated.

1. vagabunda, *Desm.* (no. 753). On dead hazel-stems.
2. Johnstonii, *B. and Br.* (no. 639\*). On dead *Senecio Jacobæa*.

### 129. CEUTHOSPORA, *Fr.*

Perithecium spurious, innate, stromatiform, multicellular. Spores ejected from one or more orifices.

1. phacidioides, *Grev. t.* 253. On holly.  
b. *Desm.* (no. 1626). = *Cytispora pulveracea*, *B.*
2. Lauri, *Grev. t.* 254. On the common laurel.

### 130. ERIOSPORA, *B. and Br.*

Stroma multicellular. Spores ejected by a common orifice, quaternate, filiform, seated on short sporophores.

1. leucostoma, *B. and Br.* (no. 438, with a fig.). On *Typha*.

## ORDER 13. MELANCONIEI.

Perithecium obsolete, or altogether wanting.

### 131. MELANCONIUM, *Lk.*

Spores simple, oozing out in a dark mass.

1. bicolor, *Nees*, including *M. sphæroideum*, *Lk.* (no. 250). On birch.
2. magnum, *B.*; *Grev. t.* 345. On walnut and hornbeam.
3. sphærospermum, *Lk.* (no. 251). On dead reeds.

### 132. STEGONOSPORIUM, *Cd.*

Spores unilocular, the endochrome transversely septate or cellulose, oozing out in a black mass.

1. cellulosum, *Cd.* On dead branches.

### 133. STILBOSPORA, *P.*

Spores septate, oozing out in a black mass.

1. ovata, *P.* On dead twigs.
2. angustata, *P.* (no. 36). On cornel.

### 134. ASTEROSPORIUM, *Kze.*

Spores stellate, septate, oozing out in a black mass.

1. Hoffmanni, *M. and N.* (no. 669). On dead birch.

### 135. CORYNEUM, *Kze.*

Spores septate, seated on a cushion-like stroma.

1. pulvinatum, *Kze.* On dead sycamore.
2. disciforme, *Kze.* (no. 450). On dead birch.
3. compactum, *B. and Br.* (no. 449). On dead elm-twigs.
4. Kunzei, *Cd.* On dead oak-twigs.
5. microstichum, *B. and Br.* (no. 451). On dead twigs of rose, vine, etc.

### 136. PESTALOZZIA, *De Not.*

Spores septate, seated on a long peduncle, crested above.

1. Guelpini, *Desm.* (no. 1084). On *Camellia* leaves.

## 137. CHEIROSPORA, Fr.

Spores collected in bundles at the tip of hyaline, filiform sporophores, forming moniliform threads.

1. botryospora, Fr. (no. 441\*). On beech-twigs.

## 138. NEMASPORA, P.

Spores coloured, oozing out in large tendrils. Spores of two kinds, some minute, others filiform, with a strong curvature.

1. crocea, P. On dead beech.
2. Rosæ, Desm. On dead rose.

## 139. MYXOSPORIUM, De Not.

Spores coloured, minute, of one kind, forming tendrils.

1. paradoxum, D. N. (no. 439). On ivy-leaves.
2. orbiculare, B.=*Cytisp. orbicularis*, B. (no. 106, with a fig.). On gourds.
3. colliculosum, B.; Sow. t. 409. On pear-leaves.

## 140. GLÆOSPORIUM, Mont.

Spores hyaline, simple, of one kind, oozing out in the form of tendrils.

1. concentricum, B. and Br.=*Cylindrosporium concentricum*, Grev. (no. 451). On living cabbage-leaves.
2. labes, B. and Br. (no. 450). On living poplar-leaves.
3. læticolor, B. (Gard. Chron. 1859, p. 604). On peaches and nectarines.
4. fructigenum, B. (Gard. Chron. 1856, p. 245). On apples.

## ORDER 14. TORULACEI.

Perithecium altogether wanting. Fructifying surface naked.

Spores compound, or arising from repeated division (tomiparous), very rarely reduced to a single cell.

#### 141. TORULA, P.

Spores tomiparous, simple.

1. monilioides, *Cd.* On sticks.
2. ovalispora, *B.* = *Conoplea cinerea*, *P.* On stumps.
3. pulvillus, *B. and Br.* (no. 463). On bark.
4. abbreviata, *Cd.* =  $\beta$ . *sphaeriiformis*, *B. and Br.* (no. 464). On decorticated *Pinus sylvestris*.
5. basicola, *B. and Br.* (no. 465, with a fig.). On dead *Nemophila*.
6. Hysterioides, *Cd. Fasc. i. f.* 139 (no. 751). On poles.
7. cylindrica, *B.* On sticks.
8. Eriophori, *B.* On dead *E. angustifolium*.
9. herbarum, *Lk.* On dead herbaceous stems.
10. Graminis, *Desm.* (no. 134). On *Carices*.
11. Plantaginis, *Cd.* (no. 252). On living *Plantagines*.
12. Sporendonema, *B. and Br.* (no. 462) = *Sporendonema casei*, *Desm.*  
On cheese and rats'-dung.

#### 142. BACTRIDIDIUM, Kze.

Spores radiating, coloured or hyaline, oblong, multiseptate.

1. flavum, *Kze.* On elm-stumps.
2. Helvellæ, *B. and Br.* (no. 816, with a fig.). On *Peziza testacea*.
3. atrovirens, *B.* On stumps. Anomalous.

#### 143. HELICOSPORIUM, Nees.

Parasitical. Spores filiform, articulated, spirally involute.

1. vegetum, *Nees* (no. 229). On sticks.
2. pulvinatum, *Fr.* On old chips.

#### 144. BISPORA, *Cd.*

Flocci tomiparous, moniliform, composed of didymous spores.

1. mouilioides, *Cd.* = *Torula antennata*, P.; Grev. t. 255. On old stumps.

145. SEPTONEMA, *Cd.*

Floeci tomiparous, mouiliform, composed of multiseptate spores.

1. spilomeum, *B.* (no. 466). On rails.

146. SPOROSCHISMA, *B. and Br.*

Floeci erect, simple. Outer membrane tough, inarticulate. Endochrome at length emergent, breaking up into quadriseptate spores.

1. mirabile, *B. and Br.* (no. 467). On beech.

147. SPORIDESMIUM, *Lk.*

Spores mostly irregular, pluricellular, springing immediately from the obscure mycelium, rarely borne upon a distinct peduncle, more rarely uniseptate.

1. polymorphum, *Cd.* (no. 452). On decaying oak.
2. antiquum, *Cd.*, *b.* compactum, *B. and Br.* (no. 453). On hard wood.
3. pyriforme, *Cd.* (no. 454). On boards.
4. melanopum, *B. and Br.* (no. 455). *Spiloma melanopum*, Eng. Bot. t. 2358. On apple-bark.
5. scutellare, *B. and Br.* (no. 456). On larch-bark.
6. Lepraria, *B. and Br.* (no. 750). *Lepraria nigra*, Eng. Bot. t. 2409. *Coniothecium effusum*, *Cd.* (no. 459).
7. fungorum, *B.* = *Epochinum fungorum*, Fr. On *Corticaria*, etc., Grev. t. 194.
8. uniseptatum, *B. and Br.* (no. 815, with a fig.). On *Clematis*.

148. CONIOTHECIUM, *Cd.*

At length naked. Spores multicellular, irregular, conglomerate.

1. amentacearum, *Cd.* (no. 460). On willow-twigs.
2. betulinum, *Cd.* (no. 461). On birch-twigs.

#### 149. DICTYOSPORIUM, *Cd.*

Spores linguæform, erect, plane, cellular. Cells subconcentric.

1. elegans, *Cd.* (no. 458). On naked oak.

#### 150. TETRAPLOA, *B. and Br.*

Spores mostly quadriarticulate, growing together in fours, and each crowned with a jointed bristle.

1. aristata, *B. and Br.* (no. 457, with a fig.). On grass.

#### 151. ECHINOBOTRYUM, *Cd.*

Parasitical. Spores unicellular, stellato-fasciculate, ovato-acuminate, rough.

1. atrum, *Cd.* (no. 457\*). On black moulds.

#### 152. GYMNOSPORIUM, *Cd.*

Mycelium very obscure. Spores unicellular, arising apparently from the matrix.

1. Arundinis, *Cd.* On reeds. The white *Gymnosporia* will be found under *Ascomyces*.

### ORDER 15. PUCCINIÆI.

Parasitic on living plants. Peridium none. Spores producing on germination secondary spores.

#### 153. XENODOCHUS, *Schlecht.*

Spores multiseptate, moniliform, breaking up into many distinct articulations.

1. carbonarius, *Schlecht.* (no. 133). On living burnet-leaves.

#### 154. AREGMA, *Fr.*

Spores cylindrical, multiseptate, scarcely moniliform, borne on a long peduncle.

1. bulbosum, *Fr.* On bramble-leaves.\*
2. gracile, *B.* *Puccinia gracilis*, *Grev.* On raspberry-leaves.
3. mucronatum, *Fr.* *Grev.* t. 15. On rose-leaves.
4. acuminatum, *Fr.* On leaves of *Poterium Sanguisorba*.
5. obtusatum, *Fr.* *Grev.* t. 57. On leaves of *Potentilla Fragariastrum*.

#### 155. TRIPHAGMIUM, *Lk.*

Spores trilocular; septa mostly vertical and horizontal.

1. Ulmariae, *Lk.* On leaves and stem of *Spiraea Ulmaria*.

#### 156. PUCCINIA, *P.*

Spores uniseptate, supported on a distinct peduncle.

1. Graminis, *P.* On wheat, reeds, etc.
2. striola, *Lk.* On *Carices*, *Junci*, *Allia*, etc.
3. coronata, *Cd.* (no. 473). On grasses.
4. truncata, *B. and Br.* (no. 754). On *Iris foetidissima*.
5. Asparagi, *DC.* On stems and leaves of *Asparagus officinalis*.
6. Polygonorum, *Lk.* On *Polygona*.
7. Vaginalium, *Lk.* On *Polygonum aviculare*.
8. Primulae, *Grev.* On common primrose.
9. Veronicarum, *DC.* On *Veronica*.
10. Glechomatis, *DC.* On ground-ivy.
11. Menthae, *P.* On mints.
12. Scorodoniae, *Lk.* On *Teucrium Scorodonia*.

\* All the species of this Order and the next are developed at first on living plants. It is not, therefore, thought necessary in every case to state that their place of growth is on living leaves, stems, etc.

13. Scrophulariæ, *Lib.* (no. 471). On *Scrophularia aquatica*.
14. Betonicæ, *DC.* On *Betonica officinalis*.
15. Vincæ, *B.* On *Vinca major*.
16. campanulæ, *Carm.* (no. 472). On *Campanulæ* and *Jasione*.
17. clandestina, *Carm.* On *Scabiosa succisa*.
18. compositarum, *Schlecht.* On various *Centaureæ*.
19. syngenesiarum, *Lk.* On thistles.
20. glomerata, *Grev.* On *Senecio Jacobæa*.
21. variabilis, *Grev. t.* 75. On *Leontodon Taraxacum*.
22. Valantiæ, *P.* On *Galium cruciatum*.
23. galiornum, *Lk.* (no. 253). On *Galia* and *Asperula odorata*.
24. umbelliferarum, *DC.*; *Grev. t.* 42. On various *Umbelliferæ*.
25. Ægopodii, *Lk.* On *Æg. Podagraria*.
26. Saniculæ, *Grev.* On *Sanicula Europæa*.
27. Bullaria, *Lk.* On stems of hemlock, etc.
28. Smyrni, *Cd.* (no. 469). On *Smyrnium Olusatrum*.
29. Anemones, *P.* On various species of *Anemone*.
30. Calthæ, *Lk.* On *Caltha palustris*.
31. Violarum, *Lk.* On violets.
32. Lychnidearum, *Lk.* On various *Caryophyllaceæ*.
33. Umbilici, *Guép.* (no. 470). On *Cotyledon Umbilicus*.
34. Rhodiolæ, *B. and Br.* (no. 468). On *Sedum Rhodiola*.
35. Saxifragarum, *Schlecht.* On *Adoxa moschatellina*.
36. Chrysosplenii, *Grev.* On *C. oppositifolium*.
37. Epilobii, *DC.* On *Epilobium palustre*.
38. pulverulenta, *Grev.* On *Epilobium montanum* and *hirsutum*.
39. Circeæ, *P.* On *Circeæ*.
40. Prunorum, *Lk.* On plum-leaves.
41. Fabæ, *Lk.*; *Grev. t.* 22. On bean-leaves.
42. Buxi, *DC.*; *Grev. t.* 17. On box-leaves.

### 157. GYMNOSPORANGIUM, *DC.*

Peduncles extremely long, agglutinated by gelatine into a tremelloid, expanded mass. Spores uniseptate.

1. Juniperi, *Lk.* (Plate 2, fig. 5.) On common juniper.

158. **PODISOMA**, *Lk.*

Peduncles extremely long, agglutinated by gelatine into a common stem, spreading out above into a *Clavariæ*form mass. Spores mostly uniseptate.

1. Juniperi-communis, *Fr.* On stems of common juniper.  
 2. foliicolum, *B.* On leaves of common juniper.  
 3. Juniperi-Sabinæ, *Fr.* (Plate 2, fig. 4.) On stems of saviue.

159. **URED**O, *Lév.*

Stroma composed of little irregular cells, forming a lenti-form disc, whose surface is covered with many layers of cells, each of which encloses a spore. Spores simple, always without any appendage.

\* *Spores more or less yellow.*

1. Potentillarum, *DC.* On *Potentillæ*.  
 2. Saxifragarum, *DC.* On *Saxifrages*.  
 3. Filicum, *Desm.* On *Cystopteris*, etc.  
 4. pustulata, *P.* On *Epilobia*.  
 5. Hypericorum, *DC.* On *Hyperica*.  
 6. Caryophyllaccarum, *Johnst.* On *Stellaricæ*.  
 7. Quercus, *Brond.* On oak.  
 8. Vacciniorum, *P.* On *V. Vitis-Idæa*.  
 9. confluens, *P.* On *Mercurialis*.  
 10. Alliorum, *DC.* On *Allia*.

\*\* *Spores brown.*

11. Statice, *Desm.* On different species of *Statice*.  
 12. Circeæ, *A. and S.* On *Circeæ*.  
 13. bifrons, *Grev.* On dock.

## 160. TRICHOBASIS, Lév.\*

Spores free, attached at first to a short peduncle, caducous.

\* *Yellow.*

1. *Rubigo-vera*, Lév. On cereals and grasses.
2. *linearis*, Lév. On cereals and grasses.
3. *glumarum*, Lév. On glumes of cereals.
4. *Symphyti*, Lév. On comfrey.
5. *Pyrolæ*, B. On *Pyrolæ*.
6. *Petroselini*, B. On *Umbelliferæ*.
7. *Senecionis*, B. On groundsel.
8. *Caricina*, B. On *Carices*.

\*\* *Spores brown.*

9. *oblongata*, B.; *Grev. t. 12.* On *Luzula*.
10. *Scillarum*, B. On *Scillæ*.
11. *Cichoracearum*, Lév. On thistles.
12. *Artemisiæ*, B. On *Artemisiæ*.
13. *Labiatarum*, Lév. On *Labiataæ*.
14. *Lychnidearum*, Lév. On *Caryophyllaceæ*.
15. *Umbellatarum*, Lév. On *Umbelliferæ*.
16. *Heraclei*, B. On *Heracleum*.
17. *Betæ*, Lév. On beet.
18. *Fabæ*, Lév.; *Grev. t. 95.* On beans.
19. *Galii*, Lév. On *Galia*.
20. *suaveolens*, Lév. On thistles.
21. *Polygonorum*, B.; *Grev. t. 80.* On *Polygona*.
22. *Vincæ*, B. On *Vinca major*.

\* Tulasne believes that all the species of this genus, as well as *Lecythea*, are mere conditions of *Aregma*, *Puccinia*, and *Melampsora*; and it is very probable that he is correct. In some cases, as in *T. linearis*, the spores seem to be merely transitional forms; in other cases, they are a different form of fruit. All the supposed species which have been recorded as British, however, are enumerated here, as in the case of the other doubtful *Coniomyces*.

23. Geranii, *B.*; *Grev. t. 8.* On geraniums.
24. Violarum, *B.* On violets.
25. Epilobii, *B.* On *Epilobia*.

### 161. UROMYCES, *Lév.*

Spores unilocular, attached permanently to a decided peduncle of greater or less length.

1. Alliorum, *DC.*
2. Ulmariae, *Lév.*; *Grev. t. 19.* On *Spiræa Ulmaria*.
3. appendiculata, *Lév.* On various plants.
4. apiculata, *Lév.* On various plants.
5. Limonii, *Lév.* On *Limonia*.
6. Ficariæ, *Lév.* On *Ranunculus Ficaria*.
7. Primulæ, *Lév.* On primroses.
8. intrusa, *Lév.* On *Alchemilla*.
9. Iridis, *Lév.* On *Iris foetidissima*.

### 162. COLEOSPORIUM, *Lév.*

Spores cylindrical, septate, some separating at the joints, some of a different nature, persistent.

1. Tussilaginis, *Lév.* On coltsfoot.
2. pingue, *Lév.* On roses.
3. Petasitis, *Lév.* On coltsfoot.
4. Campanulæ, *Lév.* On *Campanulæ*.
5. Sonchi-arvensis, *Lév.* On sow-thistle.
6. Rhinanthacearum, *Lév.* On *Euphrasia, etc.*

### 163. MELAMPSORA, *Cast.*

Spores of two orders, crowded into a dense compact mass, with or without a covering, wedge-shaped.

1. Euphorbiæ, *Cast.* On spurge.

2. *populina*, *Lév.* On *Populus nigra*.
3. *Tremulæ*, *Tul.* On *Populus tremula*.
4. *betulina*, *Desm.* On birch.
5. *salicina*, *Lév.* On willow.

#### 164. LECYTHEA, *Lév.*

Stroma surrounded or sprinkled with elongated abortive spores. Spores free, invested with their mother-cell, or concatenate.

\* *Spores free.*

1. *Ruborum*, *Lév.* On brambles.
2. *Rosæ*, *Lév.* On rose.
3. *populina*, *Lév.* On poplar.
4. *Euphorbiæ*, *Lév.* On spurge.
5. *epitea*, *Lév.* On willows.
6. *mixta*, *Lév.* On willows.
7. *saliceti*, *Lév.* On willows.
8. *Baryi*, *B. (no. 755).* On grass.
9. *Valerianæ*, *B.* On *Valeriana officinalis*.

\*\* *Spores invested with another cell (Physonema, Lév.).*

10. *gyrosa*, *Lév.* On raspberry.

\*\*\* *Spores concatenate (Podosporium, Lév.).*

11. *capræarum*, *Lév.* On willow.
12. *Lini*, *Lév.* On *Linum catharticum*.

#### 165. CYSTOPUS, *Lév.*

Receptacle consisting of thick branched threads. Spores concatenate, at length separating.

1. *candidus*, *Lév.;* *Grev. t. 251.* On *Capsella*, *Sisymbrium*, etc.

#### 166. POLYCYSTIS, *Lév.*

Spores irregular, consisting of several cells.

1. Colchici, *Tul.* (no. 485). On colchicum.
2. Violæ, *B. and Br.* (no. 487). On violet.
3. parallela, *B. and Br.* (no. 486). On rye, etc.

#### 167. TILLETIA, *Tul.*

Spores spherical, springing from delicate branched threads. Epispore reticulated.

1. Caries, *Tul.* On grains of wheat, etc.

#### 168. USTILAGO, *Lk.*

Plant deeply seated. Spores simple, springing from delicate threads, or produced in the form of closely packed cells, which ultimately break up into a powdery mass.

1. segetum, *Dittm.* On seeds of cereals and other *Gramineæ*.
2. urceolorum, *Tul.* On seeds of *Carices*.
3. longissima, *Tul.* On leaves of *Poa aquatica*.
4. olivacea, *Tul.* On seeds of *Carices*.
5. hypodytes, *Fr.* (no. 481). On stems of various grasses.
6. Maydis, *Cd.* On stems, etc., of Indian corn.
7. Montagnei, *Tul.* (no. 479). On seeds of *Rhynchospora alba*.
8. typhoides, *B. and Br.* (no. 480). On stems of reeds.
9. Salveii, *B. and Br.* (no. 482). On leaves of *Dactylis glomerata*.
10. grammica, *B. and Br.* (no. 483). On stems of *Aira aquatica*.
11. vinosa, *Tul.* (no. 484). On seeds of *Oxyria reniformis*.
12. utriculosa, *Tul.* On seeds of *Polygona*.
13. flosculorum, *Tul.* On flowers of scabious.
14. receptaculorum, *Fr.* On receptacles of goatsbeard.
15. antherarum, *Tul.* On anthers of *Silene*.

#### 169. TUBURCINIA, *Fr.*

Plant deeply seated. Spores multicellular, subglobose, or conchiform. Allied to *Sporidesmium*.

1. scabies, *B.* (no. 489). On potatoes.
2. Trientalis, *B. and Br.* On leaves of *T. Europæa*.

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ORDER 16. *ÆCIDIACEI*.

Peridium distinctly cellular.

170. *RÆSTELIA*, *Reb.*

Peridium elongated, the component cells at length separating or lacerated.

1. cancellata, *Reb.* On pear-leaves.
2. cornuta, *Tul.*; *Grev. t.* 180. On mountain-ash.
3. lacerata, *Tul.*; *Grev. t.* 209. On hawthorn.

171. *PERIDERMIMUM*, *Chev.*

Peridium elongated, at length ruptured irregularly.

1. Pini, *Chev.*; *Grev. t.* 7. On Scotch fir.
2. clatinum, *Tul.* On silver fir, altering both the foliage and ramification.

172. *ÆCIDIDIUM*, *P.*

Peridium rarely elongated, opening by radiating reflected teeth, or very short and bursting irregularly. Spores concatenate.

1. Allii, *Grev.* On *A. ursinum*.
2. Ari, *B.* On *A. maculatum*.
3. rubellum, *P.* On docks.
4. Primulæ, *DC.* On primrose.
5. Soldanellæ, *Hornsc.* On *Soldanella alpina*.
6. Pedicularis, *Loboschutz* (no. 254). On *Pedicularis*.
7. Menthæ, *DC.* On mints.

8. *Asperifolii*, *P.* (no. 255). On *Boragineæ*.
9. *Tragopogonis*, *P.* On goatsbeard.
10. *Compositarum*, *Mart.* On daisy, etc.
11. *Valerianacearum*, *Dub.* On *V. officinalis*.
12. *Periclymeni*, *DC.* On woodbine.
13. *Bunii*, *DC.* On earthnut.
14. *Galii*, *P.* (no. 490). On *Galium verum*.
15. *Ranunculacearum*, *DC.* On buttercups.
16. *Calthæ*, *Grev.* On *C. palustris*.
17. *leucospermum*, *DC.* On wood anemone.
18. *quadrifidum*, *DC.* On garden anemone.
19. *Thalietri*, *Grev. t. 4.* On *T. alpinum*.
20. *Geranii*, *DC.* On *Gerania*.
21. *Berberidis*, *P.*; *Grev. t. 97.* On berberry.
22. *Violæ*, *Schum.* On violets.
23. *Behenis*, *DC.* On *Silene inflata*.
24. *albescens*, *Grev.* On *Adoxa moschatellina*.
25. *Epilobii*, *DC.* On *E. montanum*, etc.
26. *Grossulariæ*, *DC.*; *Grev. t. 62.* On gooseberry.
27. *crassum*, *P.* On buckthorn.
28. *Orobi*, *DC.* On *Orobis tuberosus*.
29. *Euphorbiæ*, *P.* On spurge.
30. *Urticæ*, *DC.* On nettles.

### 173. ENDOPHYLLUM, *Lév.*

Peridium enclosed in the leaf, bursting irregularly.

1. *Sempervivi*, *Lév.* (no. 476). On houseleek.

### FAM. IV.—HYPHOMYCETES.

Filamentous. Fertile threads naked, for the most part free, especially above, or loosely compacted, simple or

branched, bearing the spores at their apices, rarely more closely packed, so as to form a distinct common stem.

#### ORDER 17. *ISARIACEI*.

Threads more or less compacted, plants assuming Hymenomycetous forms.

##### 174. *ISARIA*, *Hill*.

Receptacle elongated, floccose, without any distinct heads. Tips of threads only free.

1. *farinosa*, *Fr.*; *Sow. t.* 308. On dead pupæ.
2. *arachnophila*, *Ditm.* (no. 117). On dead spiders.
3. *brachiata*, *Schum.* (no. 30). On dead herbaceous stems.
4. *citrina*, *P.* (no. 31). On decaying Fungi.
5. *intricata*, *Fr.* (no. 118). On decaying Fungi.
6. *Friesii*, *Mont.* (no. 491). On dead twigs.
7. *puberula*, *Berk.* (no. 221, *with a fig.*). On dead flowers of dahlia.

##### 175. *ANTHINA*, *Fr.*

Receptacle elongated, vertical, confluent with the stem, dilated above. Tips of threads only free.

1. *flammea*, *Fr.* (no. 119). (Plate 21, fig. 3.)

*A. flavo-virens* and *brunnea* are both probably mere conditions of the mycelium of *Hypoxyton coccineum*, Bull.

##### 176. *CERATIUM*, *A. and S.*

Receptacle branched, cylindrical, membranous, reticulated, subgelatinous, clothed with short fertile flocci, one in the centre of each reticulation.

1. *hydroides*, *A. and S.*; *Grev. t.* 168.

177. PACHNOCYBE, *Berk.*

Stem solid, filiform below, clavate above, dusted with the minute spores.

1. *subulata*, *Berk. Eng. Fl. l. c. p. 333*; *Sow. t. 386. f. 5.* On dead herbaceous plants.
2. *grisea*, *B. Eng. Fl. l. c. p. 334.* On dead herbaceous stems.
3. *acicula*, *B. l. c.* On dead herbaceous stems.
4. *albida*, *B. l. c. p. 335.* On rotten wood.

## ORDER 18. STILBACEI.

Receptacle subglobose, often stipitate, clothed with mostly minute, diffluent, subgelatinous spores.

178. STILBUM, *Tode.*

Stem firm, elongated. Head nearly globose. Spores minute or elongated, involved in gluten.

\* *Stem formed of interwoven flocci, more or less villous.*

1. *tomentosum*, *Schrad.; Grev. t. 281, and t. 3 junior.* On *Trichia*, etc.
2. *aurantiacum*, *B. (no. 223).* On dead elm-branches.
3. *vaporarium*, *B. and Br. (no. 493).* On wood, in stoves. Scarcely indigenous.
4. *fasciculatum*, *B. and Br. (no. 492).* On decayed wood.
5. *fimctarium*, *B. and Br. (no. 494).* On dung. (*Helotium fimctarium*, *P.*)
6. *erythrocephalum*, *Ditm. l. c. t. 45.* On dung.

\*\* *Stem rigid, mostly black.*

7. *rigidum*, *P. (no. 32).* On decayed wood.
8. *piliforme*, *P. (no. 33).* On decayed wood.
9. *bicolor*, *P.* On decayed wood.

10. anomalum, *B.* (no. 34, with a fig.). On dead twigs.
11. nigrum, *B.* On dead *Eriophorum pubescens*. Spores subcylindric.
12. pellucidum, *Schrad.* On wood and decayed Fungi.

\*\*\* Stem soft, pellucid.

13. turbinatum, *Tode.* On soft decayed wood.
14. vulgare, *Tode.* On decayed wood.

### 179. ATRACTIUM, *Fr.*

Stem firm. Head subglobosc. Spores fusiform, elongated.

1. flammecum, *B. and Ravenel, MSS.* (no. 757). On bark of living willows.

### 180. VOLUTELLA, *Tode.*

Receptacle fringed or studded with long hyaline bristles. Spores diffluent, gelatinous.

1. ciliata, *Fr.* *Psilonia rosca*, *Berk. in Eng. Fl. l. c. p.* 353 (no. 495).  
On potatoes, etc.
2. setosa, *B.* *Ægerita setosa*, *Grev. t.* 268. *f.* 2. On wood, etc.
3. hyacinthorum, *B.* *Psilonia hyacinthorum*, *Eng. Fl. l. c.* On dead bulbs.
4. Buxi, *B. and B.* *Fusisporium Buxi*, *Fr.* (no. 495). On box-leaves.
5. melaloma, *B. and B.* (no. 496). On *Carices*.\*

### 181. TUBERCULARIA, *Tode.*

Receptacle verrucæform, innate, clothed with a dense stratum of gelatinous, minute spores.

1. vulgaris, *Tode; Sow. t.* 294. On twigs, as currant.

\* There is reason to believe that these two last, as also *Atractium flammecum*, are mere conditions of ascigerous Fungi. All the species of the following genus are probably subject to a similar remark.

2. *granulata*, *P.* ; *Grev. t.* 187. On fallen branches.
3. *nigricans*, *Lk.* On fallen branches, etc.
4. *persicina*, *Dim. l. c. t.* 49. On pustules of *Aecidia*.

### 182. FUSARIUM, *Lk.*

Receptacle discoid, innato-crumpent, immarginate, clothed with diffluent subgelatinous spores.

1. *lateritium*, *Nees (no. 249)*. On dead twigs.
2. *tremelloides*, *Grev. t.* 10. On dead nettle-stems.
3. *roseum*, *Lk.* On dead stems of mallows, etc.

### 183. MYROTHECIUM, *Tode.*

Receptacle at length marginate. Spores diffluent, oblong, forming a flat or slightly convex, dark-green stratum.

1. *roridum*, *Tode* ; *Grev. t.* 140. On decaying plants.

As the disc is at first covered, this is usually associated with *Trichoderma*, but its affinities seem to be with *Stilbacei*.

### 184. EPICOCCUM, *Lk.*

Receptacle subglobose, vesicular, studded with large, sometimes stipitate spores.

1. *neglectum*, *Desm. (no. 500)*. On various decaying plants.
2. *Equiseti*, *B. (Uredo Equiseti, Eng. Fl.)* The affinities of this genus are doubtful.

### 185. ILLOSPORIUM, *Mart.*

Receptacle obscure. Spores irregular, falling away like meal.

1. *roseum*, *Fr.* ; *Grev. t.* 51. On the larger tree-lichens.
2. *carneum*, *Fr. (no. 497)*. On *Peltidea canina*.

3. corallinum, *Roberge*; (no. 498). On *Borrera tenella*.  
 4. coccineum, *Fr.* (no. 499). On *Pertusaria communis*.

### 186. ÆGERITA, *P.*

Receptacle obscure. Spores irregular, disposed in short moniliform threads at the apices of flexuous, branched, radiating, compacted peduncles.

1. candida, *P.* (no. 823, with a fig.). On branches of willow, etc.

*Periola tomentosa* is simply a condition of *Fusisporium Solani*. There is no peridium in *Ægerita*.

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### ORDER 19. DEMATIEI.

Threads free, rarely collected into stipitiform bundles, more or less corticated and carbonized, as are frequently the simple or septate spores.\*

### 187. ARTHROBOTRYUM, *Cesati*.

Common stem composed of jointed threads. Spores large, radiating so as to form a little head, dark, septate.

1. atrum, *B. and Br.* (no. 822, with a fig.). On dead nettles.

### 188. DENDRYPHIUM, *Cd.*

Threads free, jointed, simple below; branched above. Branches and branchlets often monilioid. Spores septate, acrogenous, concatenated.

1. comosum, *Walr.* (no. 520). On dead stems.

\* In the more typical species, there is a distinct membrane, which shells off; and where this does not exist, the threads are dark and dingy, but never white, or of pure tints.

2. *curtum*, *B. and Br.* (no. 538, with a fig.). On dead nettles.
3. *laxum*, *B. and Br.* (no. 539, with a fig.). On *Inula viscosa*.
4. *griseum*, *B. and Br.* (no. 540, with a fig.). On nettle-stems, *Currey*.  
Aberrant.
5. *fumosum*, *B.* (*Dactylium fumosum*, *Cd.*). On dead *Umbelliferae*.

### 189. PERICONIA, *Cd.*

Stem composed of fasciculate, compacted threads. Head globose. Spores fixed to the free apices of the threads.

1. *glaucocephala*, *Cd.* (no. 495). On decaying linen.
2. *calicioides*, *B.* *Sporocybe calicioides*, *Fr.* On dead herbaceous stems.

### 190. SPOROCYBE, *Fr.*

Flocci septate, free. Heads globose, studded with spores.

1. *byssoides*, *Fr.* On dead herbaceous stems, etc.
2. *nigrella*, *B.* (no. 227, with a fig.). On dead grass.
3. *alternata*, *B.* (no. 227\*, 126, with a fig.). On damp paper.

### 191. STACHYBOTRYS, *Cd.*

Flocci septate, free. Branches bearing short, verticillate ramuli at their apices, forming a little head, and each terminated by a spore.

1. *atra*, *Cd.* (no. 817). On damp mill-board.
2. *lobulata*, *B.* (no. 228, with a fig.). On damp linen.

### 192. HAPLOGRAPHIUM, *B. and Br.*

Flocci septate, free, black. Spores concatenate, hyaline.

1. *delicatum*, *B. and Br.* (no. 818). On dead stumps.

193. MONOTOSPORA, *Cd.*

Flocci septate, free, black, bearing one or rarely two (by division) large, black, subglobose spores at their apex.

1. megalospora, *B. and Br.* (no. 759, with a fig.). On bark of yew.
2. sphaerocephala, *B. and Br.* (no. 819, with a fig.). On dead stumps.

194. CEPHALOTRICHUM, *Lk.*

Flocci free, septate, branched at the apex, and forming there a little globose tuft of hairs, on which are seated the spherical spores.

1. curtum, *B.* (no. 222, with a fig.). On dead *Carices*.

195. CEDEMIUM, *Fr.*

Flocci free, dark, flexuous. Spores seated on sporangiiform bodies towards their base.

1. atrum, *Fr.* (no. 501). On fallen branches.

196. HELMINTHOSPORIUM, *Lk.*

Flocci irregular, simple or slightly branched, bearing here and there multiseptate spores.

1. Smithii, *B. and Br.* (no. 507, with a fig.). On holly.
2. folliculatum, *Cd.* (no. 231). On dead wood.
3. macrocarpum, *Grev. t.* 148. *f.* 1. On fallen sticks.
4. subulatum, *Nees.* On oak-branches.
5. velutinum, *Lk.*; *Grev. t.* 148. *f.* 2. On rotten sticks.
6. fusisporium, *B. Eng. Fl. l. c. p.* 336. On rotten sticks.
7. nanum, *Nees.* On dead herbaceous plants.
8. simplex, *Kze.* On rotten branches.
9. Tiliæ, *Fr.* (no. 230). On lime.
10. Rousselianum, *Mont.* (no. 509). With *Sporoschisma mirabile*.

11. *turbinatum*, *B. and Br.* (no. 508, with a fig.). On dead wood.
12. *obovatum*, *B.* (no. 232, with a fig.). On dead wood.
13. *delicatulum*, *B.* (no. 233, with a fig.). On dead wood.
14. *sticticum*, *B. and Br.* (no. 758, with a fig.). On dead grasses.
15. *Clavariarum*, *Desm.* (no. 123). On *Clavariæ*.

#### 197. MACROSPORIUM, *Fr.*

Flocci obscure or delicate. Spores erect, basal, pedicellate, with at length transverse and vertical septa.

1. *Cheiranthi*, *Fr.* On damp paper, decaying plants, etc.
2. *sarcinula*, *B.* (no. 125, with a fig.). On decaying gourds.
3. *concinnum*, *B.* (no. 235, with a fig.). On old willow-twigs.
4. *Brassicæ*, *B. Eng. Fl. l. c. p.* 339. On dead cabbage-leaves.

#### 198. TRIPOSPORIUM, *Cd.*

Flocci erect, jointed, bearing at their apices tri-radiate, articulated spores.

1. *elegans*, *Cd.* (no. 509). On decorticated oak.

#### 199. HELICOMA, *Cd.*

Flocci erect, dark, jointed, bearing on their sides pale, flat, spiral spores.

1. *Mulleri*, *Cd.* (no. 510). On dead wood.

#### 200. CLADOTRICHUM, *Cd.*

Flocci erect, thick, branched. Upper joints cup-shaped or inflated. Spores large, septate.

1. *triseptatum*, *B. and Br.* (no. 511, with a fig.). On old stumps.

## 201. POLYTHRINCIUM, Kze.

Flocci moniliform. Spores springing from the midst of the flocci, didymous.

1. trifolii, Kze.; Grev. t. 216. On living clover-leaves.

## 202. CLADOSPORIUM, Lk.

Flocci flexuous, more or less branched, jointed, flexible. Spores short, at length uniseptate, springing from the sides or terminal.

1. herbarum, Lk. On all kinds of decaying matter.
2. dendriticum, Walr. (no. 512). On pear-leaves.\*  
    β. orbiculatum, Desm. (no. 513). On leaves of *Pyracantha*. A variety of the last.
3. depressum, B. and Br. (no. 514, with fig.). On leaves of *Angelica sylvestris*.
4. brachormium, B. and Br. (no. 515). On leaves of *Fumaria officinalis*.
5. lignicolum, Cd. (no. 516). On dead wood.
6. nodulosum, Cd. (no. 517). On dead herbaceous stems.

*Clad. fumago* is not a distinct species, but consists of *C. herbarum* mixed up with species of several other genera.

## 203. ARTHRINIUM, Kze.†

Flocci erect, septate, dark, and slightly thickened at the septa. Spores straight, swollen in the middle, and pointed at either extremity (fusiform).

1. sporophleum, Kze. (no. 519). On *Carices*.

## 204. GONATOSPORIUM, Cd.

Flocci erect, septate, thickened at the septa. Spores irre-

\* *Actinonema Cratægi* is merely a form of this species.

† The threads in this and the two following genera are carbonized only at the joints.

gularly biconical, and in consequence somewhat angular, attached in whorls.

1. puccinioides, *Cd.* (no. 236, 519). *Torula Eriophori*, *B. in Eng. Fl.*  
On *Carices* and *Eriophorum*.

### 205. CAMPTOUM, *Lk.*

Flocci erect, septate, thickened at the septa, and black. Spores curved, dark, fixed in clusters at the apices.

1. curvatum, *Lk.* (no. 518). On *Scirpus sylvaticus*.

### 206. SPORODUM, *Cd.*

Flocci erect, septate. Threads of inarticulate spores moniliform, seated towards their base.

1. conoploides, *Cd.* (no. 543). On dead grasses.

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## ORDER 20. MUCEDINES.

Threads never coated with a distinct membrane, mostly white or coloured, more rarely dingy.\*

### 207. ASPERGILLUS, *Mich.*

Threads erect, articulate, crowned with a globose head, producing necklaces of spores.

1. glaucus, *Lk.* On various decaying substances.  
2. dubius, *Cd.* (no. 520). On rabbits' dung.  
3. candidus, *Lk.* On various decaying substances.

\* Perhaps *Dematiei* should be restricted to such genera as *Helminthosporium*, *Edemia*, etc., and *Mucedinei* to the white and coloured species, a distinct order, including the aberrant forms of either order.

4. *roseus*, *Lk.* On damp paper, carpets, etc.
5. *mollis*, *B.*; *Eng. Fl. l. c. p. 340.* On dead leaves.
6. *virens*, *Lk.* On Agarics.

#### 208. NEMATOGONUM, *Desm.*

Threads clavate at the apices, and bearing necklaces of spores on distinct scattered spicules.

1. *aurantiacum*, *Desm. (no. 237, with a fig.)*. On bark, etc.
2. *aureum*, *B.* *Aspergillus aureus*, *B. in Eng. Fl.* On bark.

#### 209. RHINOTRICHUM, *Cd.*

Threads erect, articulate, clavate above, and bearing spores attached to spicules.

1. *Bloxami*, *B. and Br. (no. 541, with a fig.)*. On dead wood.
2. *Thwaitesii*, *B. and Br. (no. 542, with a fig.)*. On the naked ground.
3. *Opuntia*, *B. and Br. (no. 761, with a fig.)*.

#### 210. BOTRYTIS, *Mich.*

Threads septate, irregularly or dichotomously branched, hyaline or coloured. Spores terminal.

1. *Tilletii*, *Desm. (no. 529)*. On leaves, naked soil, etc.
2. *citrina*, *B. (no. 27, with a fig.)*. On dead twigs.
3. *Jonesii*, *B. and Br. (no. 760, with a fig.)*. On dung.
4. *terrestris*, *P. (no. 240)*; *Grev. t. 257*. On the naked ground.

#### 211. PERONOSPORA, *Cd.*,\* *Casp.*

Parasitic threads mostly inarticulate. Spores of two kinds:

\* Since the discovery of the second form of fruit, of which Corda knew nothing, it is expedient to adopt his generic name, which I do with reluctance, as *P. parasitica* seems more entitled to the name of *Botrytis* than other allies, after *Polyactis* is removed. Corda's *Peronospora*; moreover, included only such species as have non-septate threads.

1, on the tips of the branchlet; 2, large, globose, on the creeping spawn. (*Artotrogus*, Mont.)

1. *parasitica*, *Cd.*; *Sow. t.* 400. *f.* 7. On *Cruciferae*.
2. *destructor*, *Casp.* (no. 239, *with a fig.*). On leaves of onions.
3. *infestans*, *Casp.* (no. 521). On potatoes, producing the well-known potato murrain.
4. *ganglioniformis*, *Casp.* (no. 526). On lettuces.
5. *arborescens*, *Casp.* (no. 525). On poppy.
6. *Viciae*, *Casp.* (no. 524). On peas, tares, etc.
7. *Urticae*, *Casp.* (no. 522). On nettles.
8. *Arenariae*, *Casp.* (no. 523). On *Arenaria trinervis*.
9. *macrospora*, *Casp.* (no. 527). *Botrytis crustosa*, *Fr.* On Umbellifers.
10. *grisea*, *Unger* (no. 528). On *Veronica Beccabunga*.
11. *effusa*, *Casp.* On spinach.
12. *violacea*, *B.* On petals of *Scabiosa arvensis*.
13. *curta*, *Casp.* (no. 128, *with a fig.*). On anemone.

## 212. VERTICILLIUM, *Lk.*

Flocci septate, hyaline or coloured. Branches verticillate. Spores apical.

1. *apicale*, *B. and Br.* (no. 531, *with a fig.*). On fallen oak-branches.
2. *nanum*, *B. and Br.* (no. 532, *with a fig.*). On pears.
3. *epimyces*, *B. and Br.* (no. 533, *with a fig.*). On *Elaphomyces*.
4. *distans*, *B. and Br.* (no. 534, *with a fig.*). On dead herbaceous stems.

*V. lateritium* appears to be only a condition of *Acrostagmus*.

## 213. HAPLARIA, *Lk.*

Flocci simple or forked, jointed. Spores scattered over the tips of the threads.

1. *grisea*, *Lk.* On decaying herbs.

214. POLYACTIS, *Lk.*

Flocci septate, brownish, branched above. Spores hyaline, in terminal clusters.

1. vulgaris, *Lk.* On decayed herbs.
2. cana, *B.* On decayed herbs.
3. vera, *B.* On decayed herbs.
4. cinerea, *B.* On decayed herbs.
5. fasciculata, *Cd.* On decayed vegetables.

215. PENICILLIUM, *Lk.*

Flocci divided above in a fasciculate manner septate, as well as the branchlets, which are terminated by necklaces of spores, collected into tassel-like heads.

1. crustaceum, *Fr.* On all kinds of decaying substances.
2. sparsum, *Grev. t. 58. f. 2.* On stalks of plants.  
*β. coremium, Grev. t. 301.* On fruit, gum, etc.
3. bicolor, *Fr.* On decaying substances.
4. candidum, *Lk.* On various decaying substances.
5. roseum, *Lk. (no. 535).* On box, etc.
6. subtile, *B. (no. 241, with a fig.).* Inside of decayed willow.  
*P. fasciculatum (no. 129)* is omitted as uncertain.

216. OIDIUM, *Lk.*

Flocci very short, producing a moniliform string of spores by tomiparous division.

1. chartarum, *Lk. (no. 130).* On damp paper.
2. aureum, *Lk.* On dead wood, etc.
3. fulvum, *Lk.* On dead wood.
4. fructigenum, *Schrad.* On decayed fruit.
5. fasciculatum, *B.* On decayed oranges.
6. Porriginis, *Mont. (no. 546).* On *Porrigio lupinosa.*

7. *favorum*, *B. and Br.* (no. 762, with a fig.). On honeycomb.
8. *æquivocum*, *B. and Br.* (no. 821). On *Polyporus Schweinitzii*.\*
9. *concentricum*, *B. and Br.* (no. 547). *Cylindrosporium*, *Unger.* On nettles, ground ivy, etc.
10. *abortifaciens*, *B.* (*Ergotetia*, *Quekett*). On plants infested with Ergot. Possibly a conidiiferous condition of *Cordiceps purpurea*, etc.

### 217. MONILIA, Hill.

Flocci erect, jointed; head none; bearing fasciculate necklaces of spores at their apices.

1. *fasciculata*, *Cd.*; *Grev. t.* 32. On dead grass.
2. *raccmosa*, *Part*; *Bolt. t.* 132. *f.* 2. On decaying substances.

### 218. DACTYLIUM, Nees.

Flocci erect, jointed, branched, bearing at the tips of the branchlets, either scattered or in tufts, septate spores.

1. *pyriferum*, *Fr.* On decayed herbaceous stems.
2. *tenellum*, *Fr.* (no. 536). On moss.
3. *macrosporum*, *Fr.* On dead leaves, etc.
4. *sphærocephalum*, *B.* (no. 243, with a fig.). On dead ivy.
5. *dendroides*, *Fr.*; *Grev. t.* 126. *f.* 1. On *Agaricini*.
6. *obovatum*, *B.* (no. 242, with a fig.). On willow-twigs.
7. *roseum*, *B.* *Tricothecium roseum*, *Fr.* On decaying plants.
8. *tenuissimum*, *B.* (no. 537). On potatoes. Perhaps only a state of *Fusarium Solani-tuberosi*.

### 219. FUSIDIUM, Lk.

Flocci coloured, very delicate, evanescent. Spores straight, filiform.

\* I have omitted *O. Tuckeri*, *O. Balsamii*, *O. erysiphoides*, *O. Leucoconium*, and *O. monilioides*, as they are all mere states of different species of *Erisyphe*.

1. griseum, *Lk.*; *Grev. t.* 102. *f.* 1. On dead leaves.
2. flavo-virens, *Fr.*; *Grev. t.* 102. *f.* 2. On dead leaves, etc.
3. album, *Desm.* (no. 248). On dry but green oak-leaves.

### 220. SPOROTRICHUM, *Lk.*\*

Flocci ascending, tufted, septate. Spores simple, scattered, at first concealed.

1. chlorinum, *Lk.* On dead leaves.
2. aurantiacum, *Grev.* On dung.
3. sulphureum, *Grev. t.* 108. *f.* 2. On corks, etc., in cellars.
4. laxum, *Grev. t.* 108. *f.* 1. On various decaying substances.

*S. geochroum* is the conidiiferous state of some *Hypoxylon*.

5. inosculans, *B. in Engl. Fl. l. c. p.* 346. On *Thelephora*.
6. fenestrale, *Ditm. l. c. t.* 1. On dirty glass.

### 221. ZYGODESMUS, *Cd.*

Flocci short, erect, springing from the creeping sterile threads; joints here and there cut halfway through.

1. fuscus, *Cd.* On decayed wood.

### 222. VIRGARIA, *Nees.*

Flocci erect, dichotomous, virgate, black, septate. Spores minute, scattered over the branches.

1. nigra, *Fr.*; *Grev. t.* 274. On fallen branches.

### 223. BOLACOTRICHIA, *B. and Br.*

Flocci unbranched, jointed, curled at the top. Spores

\* It may be doubted whether there are any genuine species of this genus, whose characters are very uncertain. They are mostly conidiiferous states of other plants.

large, globose, shortly pedicellate, conglomerated towards their base.

1. *grisea*, *B. and Br.* (no. 506, with a fig.). On dead cabbage-stalks.

#### 224. MYXOTRICHUM, *Kze.*

Flocci branched, bearing towards their base little conglomerated masses of spores.

1. *chartarum*, *Kze.* (no. 121). On damp straw.
2. *deflexum*, *B.* (no. 122, with a fig.). On damp paper and wood.

#### 225. GONYTRICHUM, *Nees.*

Flocci branched, here and there bearing knots, from which spring the verticillate, fertile, septate threads, crowned at their tips with a globose mass of spores.

1. *caesium*, *Nees*; *Cd. Ic.* ii. f. 51. On fallen branches, in woods.

#### 226. MENISPORA, *P.*

Flocci erect, jointed. Spores heterogeneous, acrogenous, fusiform or cylindrical, simple, at first joined together in bundles, then irregularly scattered over the flocci.

1. *lucida*, *Cd. Ic.* i. f. 223 (no. 533). On decayed wood.

#### 227. CHÆTOPSIS, *Grev.*

Flocci erect, jointed, subulate, below branched and verticillate, above simple and flagelliform. Spores cylindrical, springing from the tips of the branchlets.

1. *Wauchii*, *Grev. t.* 236. On decayed wood.

#### 228. ACREMONIUM, *Lk.*

Flocci creeping, jointed, beset with short patent branches, each of which bears a spore.

1. verticillatum, *Lk.*; *Grev. t. 124. f. 2.* On dead wood.
2. alternatum, *Lk.* On dead leaves.
3. fuscum, *Schm.*; *Grev. t. 124. f. 1.* On dead wood.

### 229. GONATOBOTRYS, *Cd.*

Threads erect, jointed; articulations swollen in the middle, and bearing obovate spores on little spicules.

1. simplex, *Cd. Pracht. t. 5.* On fruit of *Tamus niger.*

### 230. CLONOSTACHYS, *Cd.*

Flocci jointed above. Branches and branchlets quaternate, subcapitate, clothed with spores, forming distinct spikes.

1. Araucaria, *Cd.*; *Curr. Mic. Journ. v. p. 126.* On dead bark.

### 231. BOTRYOSPORIUM, *Cd.*

Flocci slightly branched, bearing patent branchlets, each of which is surmounted by a few spicules bearing a head of spores.

1. pulchrum, *Cd. Pracht. t. 15.* On decaying herbs.
2. diffusum, *Cd.*; *Grev. t. 126. f. 2.* On decaying herbs.

### 232. PAPULASPORA, *Preuss.*

Flocci decumbent, jointed, producing short erect branches, each of which produces a cellular head studded with erect spores, the endochrome of which is bipartite or quadripartite.

1. sepedonioides, *Preuss. (no. 761\*).* On rice paste.

### 233. RHOPALOMYCES, *Cd.*

Flocci free, septate, swelling at the tip into an arcuate

head, each cell of which bears a spicule, surmounted by a spore.

1. pallidus, *B. and Br.* (no. 504, with a fig.). On Russian matting.
2. candidus, *B. and Br.* (no. 505, with a fig.). On decayed hops.

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ORDER 21. SEPEDONIEI.

Mycelium floccose. Fertile flocci obscure, and in consequence the spores rest upon the matrix.\*

234. SEPEDONIUM, *Lk.*

Spores large, simple and globose, or appendiculate.

1. chrysospermum, *Lk.*; *Grev. t.* 198. On *Boleti*.
2. roseum, *Fr.* (no. 132). On *Agaricus vellereus*, etc.

235. FUSISPORIUM, *Lk.*

Spores elongated, fusiform, curved, at length septate, forming a gelatinous mass.

1. Betæ, *Desm.* (no. 246). On beet-root.
2. Georginæ, *Berk.* On tubers of dahlia.
3. udum, *B.* (no. 245, with a fig.). On trees, in spring.
4. roseolum, *Steph.* (no. 549). On decayed potatoes.
5. fæni, *B. and Br.* (no. 550). On hay.
6. bacilligerum, *B. and Br.* (no. 548). On leaves of *Alaternus*.
7. atro-virens, *B. in Eng. Fl. l. c. p.* 351. On onions.
8. aurantiacum, *Lk.* On decayed gourds, etc.
9. insidiosum, *B. in Gard. Chr.* 1860. On *Agrostis pulchella*.

This species has threads very like those of *Ægerita*.

\* The spores are the principal element in this Order, which approaches *Coniomycetes*.

10. *Solani-tuberosi*, *Mart.* On decaying potatoes.

This is *Periola tomentosa*, *Fr.*, or at least the perfect condition of it. As in the last, the flocci are too much developed to be consistent with the characters of the Order.

### 236. EPOCHNIUM, *Lk.*

Sterile flocci creeping, fertile obsolete. Spores septate, attached apparently to the matrix.

1. *macrosporoidcum*, *B.* (no. 131, with a fig.). On dead *Ribes*.

### 237. PSILONIA, *Fr.*

Flocci persistent, joined into an crumpled mass, at first covering the simple spores.

1. *nivea*, *Fr.* (no. 822). On beech-trunks.

2. *gilva*, *Fr.* On dead herbaceous stems.

3. *Arundinis*, *Desm.* (no. 35 and 551). On dead leaves and stems of reeds.



## ORDER 22. TRICHODERMACEI.

Flocci covering the spores, and forming a kind of peridium, which at length vanishes in the centre.

### 238. PILACRE, *Fr.*

Stem solid, cylindrical. Head globose, composed of flexuous, branched, radiating threads. Spores produced near the tips, forming a dusty mass.

1. *faginea*, *B. and Br.* (no. 380, with a fig.). On beech-sticks.

2. *Petersii*, *B. and Curt.* (no. 824). On hornbeam. Smell like that of *Hypericum Androsaemum*.

239. INSTITALE, *Fr.*

Stem none; common mass containing many cavities filled with spores.

1. *effusa*, *Fr.* (no. 756). At roots of Scotch fir.

*I. acariformis* is merely a state of *Hypoxylon coccineum*, and *I. radiata* of *Coprinus radiatus*.

240. TRICHODERMA, *P.*

Peridium spurious, indeterminate, roundish, composed of interwoven even flocci, at length vanishing in the centre. Spores spread over the disc.

1. *viride*, *P.*; *Grev. t.* 271. On dead wood, etc. Probably not autonomous.

241. ARTHRODERMA, *Curr.*

Peridium spurious, indeterminate, roundish, composed of interwoven, strongly constricted, jointed flocci. Spores collected in the centre.

1. *Curreyi*, *B.*; *Micr. Journ.* ii. p. 240. On dead leaves and sticks.

Reasons have been given above for not placing *Myxothecium* here. *Myxormia* has too compact an excipulum to be placed with *Myxothecium*, or in this place.

## FAM. V.—ASCOMYCETES.

Fruit consisting of sporidia, mostly definite, contained in asci, springing from a naked or enclosed stratum of fructifying cells, and forming an hymenium or nucleus.

ORDER 23. *ELVELLACEI*.

Hymenium at length more or less exposed. Substance soft.

242. *MORCHELLA*, *Dill.*

Receptacle clavate or plicate, impervious in the centre, stipitate, covered with the hymenium, which is deeply folded and pitted.

1. *M. esculenta*, *P.*; pileus ovate, adnate at the base; ribs firm, anastomosing, and forming deep pits; stem even. (Plate 21, fig. 5.)—*Grev. t.* 68; *Huss. i. t.* 13.

In woods, gardens, etc. Esculent. Varying much in breadth and height, sometimes conical (*no.* 553), sometimes almost cylindrical.

2. *M. patula*, *P.*; pileus obtuse, free halfway up; pits rhomboid; stem even.—*Sow. t.* 51, *in part.*

In woods, etc. Rare.

3. *M. semilibera*, *DC.*; pileus conical, free halfway up; ribs longitudinal, forming oblong pits, which are veined within; stem even.—*Grev. t.* 89.

Under hedges, etc. Not uncommon.

243. *GYROMITRA*, *Fr.*

Receptacle inflated, bullate, rough with raised gyrose ribs.

1. *G. esculenta*, *Fr.*; pileus inflated, irregular, undulated, gyroso-rugose, brown; margin united with the even villous stem: (*no.* 825.)

In pine-woods. Rare. Weybridge, *F. Currey.*

244. *HELVELLA*, *L.*

Receptacle plicate, hanging down over the stem, concave and barren below. Hymenium even.

1. *H. crispa*, *Fr.*; pileus deflexed, lobed, at length free, crisped, pallid; stem fistulose, costato-laeunose. (Plate 21, fig. 4.)—*Grev. t.* 143; *Sow. t.* 39.

In woods. Common. Esculent.

2. *H. lacunosa*, *Afz.*; pileus inflated, lobed, cinereous-black; lobes deflexed, adnate; stem fistulose, costato-laeunose.—*Grev. t.* 36.

In woods. Common. Esculent. *H. sulcata* (*no.* 764) is, I believe, only a form of this.

3. *H. elastica*, *Bull.*; pileus free, even, inflated, at length acutely lobed; stem elongated, slender, attenuated, pruinose.—*Sow. t.* 154: (*no.* 86.)

In woods. Not uncommon. Approaches very near to *Peziza macropus*.

4. *H. ephippium*, *Lév.*; small; pileus deflexed, lobed, decidedly velvety beneath: (*no.* 552.)

On the ground, in woods. Not uncommon. Scarcely one inch high.

#### 245. VERPA, *Swartz.*

Receptacle clavato-pileate, hollow below and inflated, or conical and adpressed, equally deflexed all round; hymenium rugulose, but not costate, or nearly even.

1. *V. digitaliformis*, *P.*; pileus campanulate, finger-shaped, rugulose, umber; stem equal, minutely squamulose transversely. (Plate 21, fig. 6.)

Under hedges. Rare. King's Cliffe. Suffolk, *Skepper*.

2. *V. conica*, *Sow.*; pileus campanulate, nearly even, brown; margin slightly sinuated, yellow beneath, as is also the equal stem.—*Sow. t.* 11.

On the ground. Very rare.

246. MITRULA, *Fr.*

Soft and fleshy, simple, capitate. Stem distinct. Hymenium surrounding the inflated club.

1. *M. cueullata*, *Fr.*; head ovate, hood-shaped, even, subferruginous; stem thread-shaped.—*Grev. t.* 81.

Amongst fir-leaves. Often overlooked from its small size.

2. *M. paludosa*, *Fr.*; head ovate, obtuse, inflated, even, orange; stem pale, hollow.—*Grev. t.* 312; *Huss. i. t.* 9.

On leaves, in ditches, etc. Local. Capel Curig, in great abundance. Extremely pretty.

247. SPATHULARIA, *P.*

Disc capitate, compressed, running down into the stem on either side.

1. *S. flavida*, *P.*; head spathulate, compressed, even, yellow; stem whitish. (Plate 21, fig. 7.)—*Grev. t.* 165.

In fir-woods. Not uncommon.

248. LEOTIA, *Hill.*

Receptacle pileate, supported in the centre by the stem; margin revolute, covered everywhere with the smooth, somewhat viscid hymenium.

1. *L. lubrica*, *P.*; tremelloid; pileus swollen, waved or slightly lobed, yellow-green; stem hollow, nearly equal, yellow. (Plate 22, fig. 1.)—*Grev. t.* 56.

In woods. Common. *L. infundibuliformis* is merely some Agaric attacked by an *Hypocrea*.

2. *L. nana*, *Fr.*; small; pileus lobed, rugose, white, even

beneath and brown; stem stuffed, cylindrical, white.—*With.* iv. p. 296.

Amongst moss. Pendarvis. Not observed since the time of Withering.

#### 249. VIBRISSEA, Fr.

Receptacle capitate, supported in the centre by the stem, covered above with the hymenium. Margin adnate to the stem. Asci and filiform sporidia bursting forth, and rendering the hymenium velvety.

1. *V. truncorum*, Fr.; simple; head orbicular, golden-yellow; stem cylindrical, glaucous, turning black: (no. 305.)

On wood, in water. Rare. Llyn Howel, Rev. T. Salwey. Scottish Highlands.

#### 250. GEOGLOSSUM, P.

Receptacle clavate, simple, confluent with the stem. Hymenium surrounding the club.

\* *Stem distinct.*

1. *G. viride*, P.; verdigris-green; stem squamulose.—*Grev. t.* 211.

In woods. Not common.

2. *G. olivaceum*, P.; smooth, dry, dingy-olive; club compressed, distinct: (no. 765.) *b.* Dingy-purple. (Plate 21, fig. 3.)

On lawns. Not common. Bath. Coed Coch. The plant figured agrees with Persoon's plate in form and general character, but is rather dingy-purple than olive. *G. atro-purpureum* has a more distinct head, and has a scaly stem. Mr. Broome's plant differs slightly in colour from mine, and is nearer to *G. viride*.

3. *G. glutinosum*, *P.*; smooth, viscid, at length blackish; stem distinct, glutinous, even.

Grassy places. Rare. Appin, *Capt. Carmichael*.

4. *G. glabrum*, *P.*; smooth, dry, at length black; stem squamulose.

Grassy places. Not common.

\*\* *Stem confluent*.

5. *G. hirsutum*, *P.*; black, hairy. (Plate 22, fig. 2.)

Amongst grass. Common.

6. *G. difforme*, *Fr.*; black, smooth, dry; head confluent with the stem.

Amongst grass. Common.

## 251. PEZIZA, *L.*

Cup-shaped; cup more or less concave, soon open. Disc naked. Asci fixed.

Series 1. ALEURIA, *Fr.*—*Fleshy, or between fleshy and membranaceous, externally pruinose or floccoso-surfuraceous. Mostly growing on the ground.*

Subgenus 1. DISCINA, *Fr.*—Cup always open, or connivent when young. Veil superficial.

1. *P. (Discina) acetabulum*, *L.*; cyathiform, dingy, adorned externally with ribs, which run up from the short lacunose stem.—*Sow. t.* 59.

On the ground, in spring. Not common. Very elegant.

2. *P. (Discina) venosa*, *P.*; sessile, more or less twisted, dark umber-brown, white beneath; disc coarsely wrinkled. (Plate 22, fig. 6.)—*Grev. t.* 156; *Huss. ii. t.* 7.

On the ground, in spring. Not uncommon. A curious form is represented in the Plate.

3. *P. (Discina) badia*, *P.*; nearly sessile, entire, flexuous, brown; margin at first involute, paler, and inclining to olive, externally pruinose. (Plate 22, fig. 4.)—*Huss.* ii. t. 13.

Margins of ponds, etc. Summer. Very variable in colour.

4. *P. (Discina) leporina*, *Batsch*; somewhat stipitate, elongated at one side, ear-shaped, subferruginous, externally mealy; hymenium and base mostly even.

On the ground, in woods. Not common. Sometimes cinereous or yellowish.

5. *P. (Discina) onotica*, *P.*; somewhat stipitate, elongated at one side, ear-shaped, mealy externally, rose-coloured or orange within, and at length rugose.—*Sow.* t. 79.

On the ground, in woods. Rare. Coed Coch. Very beautiful.

6. *P. (Discina) aurantia*, *Fr.*; nearly sessile, irregular, oblique, orange, whitish externally and somewhat pruinose.—*Sow.* t. 78; *Huss.* i. t. 37.

On the ground, in woods, generally near old stumps. Common. Sporidia rough.

7. *P. (Discina) cochleata*, *Huds.*; sessile, caespitose, large, twisted, umber, externally pruinose.—*Sow.* t. 5.

Amongst grass. Not common.

8. *P. (Discina) succosa*, *B.*; cup nearly regular, entire, pale waxy-brown, externally white and pruinose; juice bright-yellow: (*no.* 156, *with fig.*)

On the ground, in gardens. Northamptonshire.

9. *P. (Discina) repanda*, *Wahl.*; large, incised, waved, brown, and somewhat wrinkled within, whitish and mealy without; base elongated, rooting.—*Grev.* t. 59.

On the ground and on stumps. Not common. Variable in size.

10. *P. (Discina) cerea*, *Sow.*; large, infundibuliform, waved,

yellowish, externally dirty-white, as well as the villous, stem-like base.—*Sow. t. 3.*

On tan-beds, etc. Very rare.

11. *P. (Discina) vesiculosa*, *Bull.*; large, entire, sessile, at first globose, inclining to top-shaped, connivent, then campanulate; mouth suberentate, pallid-brown, externally furfuraceous.—*Grev. t. 107*; *Sow. t. 4.*

On dunghills and hotbeds, extremely common. *Bolt. t. 175* is probably this species.

12. *P. (Discina) micropus*, *P.*; middle-sized, oblique, pallid, squamulose, furfuraceous externally; base stem-like. (Plate 22, fig. 5.)

On beech-stumps. Very rare. Fineshade, Northamptonshire.

13. *P. (Discina) pustulata*, *P.*; sessile, subglobose, pallid, somewhat dingy, furfuraceous, and dirty-white externally; margin entire.—*Hedw. Musc. Fr. ii. t. 6 A: (no. 307.)*

On the ground. Very rare.

14. *P. (Discina) radula*, *B. and Br.*; large, cup-shaped, sessile, at length depressed, externally black, rough with nearly equal warts, within vinous-brown; sporidia globose, tuberculate.—*Ann. of Nat. Hist. xviii. p. 77.*

On the ground, in woods. Very rare. Bristol. Analogous to *Genea verrucosa*.

15. *P. (Discina) viridaria*, *B. and Br.*; middle-sized; mycelium floccose, expanded, white; cups at first globose, then hemispherical, at length expanded, watery-grey, externally rough with brown furfuraceous particles: (*no. 555.*)

On damp walls and water-butts. Rare. King's Cliffe.

16. *P. (Discina) luteo-nitens*, *B. and Br.*; crowded, bright-yellow; cups concave, nearly regular, at length flexuous: (*no. 556.*)

On the bare ground. Rare. King's Cliffe. At first sight apparently a variety of *P. aurantia*, but the sporidia are not rough.

Subgenus 2. *GEOPYXIS*, *Fr.*—Veil innate. Cup when young subglobose, closed, then open and orbicular. Substance fleshy, rarely fibrous.

17. *P. (Geopyxis) macropus*, *P.*; cup hemispherical, cinereous, hirto-verrucose; disc mouse-coloured, turning pale; stem very long, attenuated.—*Grev. t.* 70.

On the ground, in woods. Common.

18. *P. (Geopyxis) tuberosa*, *Bull.*; thin; cup funnel-shaped, bright brown, turning pale; stem elongated, springing from an irregular black tuber.—*Sow. t.* 63; *Huss. ii. t.* 10.

On the ground, in woods. Spring. Not uncommon. Tuber exactly resembling some *Sclerotium*.

19. *P. (Geopyxis) Rapulum*, *Bull.*; thin, yellow-brown; cup funnel-shaped, nearly smooth; stem twisted; root elongated, fibrillose.—*Bull. t.* 485. *f.* 2.

On the ground. Observed only by Dickson.

20. *P. (Geopyxis) cupularis*, *L.*; nearly sessile, thin, globoso-campanulate, fawn-coloured or pallid, mealy externally; margin crenate: (*no.* 308.)

On the ground, in gardens, etc. Not common. Sometimes yellowish.

21. *P. (Geopyxis) sepulta*, *Fr.*; hypogæous, globose, clothed with dense woolly fibres; hymenium at length exposed by rupture of the upper portion: (*no.* 766.)

On the ground. East Bergholt. A coarse, unsightly species.

22. *P. (Geopyxis) Cornubiensis*, *B. and Br.*; middle-sized, sessile, fixed by down; margin alone free, somewhat flat-

tened, minutely villous externally; hymenium orange; sporidia oblong, rather rough.

On manured ground. Penzance.

23. *P. (Geopyxis) saniosa*, *Schrad.*; sessile, concave, milky, brown-purple externally, pulverulent, umber: (no. 87, with a fig.)

On the ground, overrun with *Thelephora sebacea*. King's Cliffe.

24. *P. (Geopyxis) argillacea*, *Sow.*; sessile, white, at length yellowish, even, at first urceolate, at length split and torn, rooting at the base, and hairy.—*Sow. t.* 148.

On modelling-clay. Observed only by Sowerby.

25. *P. (Geopyxis) granulata*, *Bull.*; sessile, minute, nearly plane, orange-red, externally granulated with papillæ.

On cow-dung. Very common. Quite destitute of bristles.

Subgenus 3. HUMARIA, *Fr.*—Veil thin, submarginal, flocculose, fugacious. Cup sessile, entire, hemispherical, flattened. Colour bright. Terrestrial.

26. *rutilans*, *Fr.* On soil.

27. *melaloma*, *A. and S.* (no. 88). On charcoal.

28. *erecta*, *Sow. t.* 369. *f.* 10, 11. On shaded ground.

29. *Polytrichi*, *Schum.* (no. 768, with a fig.). On heaths.

30. *leucoloma*, *Reb.* (no. 768). On the ground.

31. *humosa*, *Fr.* (no. 768). On the ground.

32. *glumarum*, *Desm.* (no. 768). On chaff, rotting on the ground.

33. *omphalodes*, *Bull.* *Thelephora carbonaria*, *Bertero*. On burnt soil.

#### Subgenus 4. ENCELIA, *Fr.*

34. *fascicularis*, *A. and S.*; *Sow. t.* 425. *f.* 1, 2. On branches, bursting through the bark.

35. *furfuracca*, *Fr.* (no. 157). On alder-branches.

Series 2. LACHNEA, Fr.—*Veil distinct, decidedly villous, or pilose, persistent. Cup in consequence bristly or hairy, always closed when young. Substance waxy, firm, rarely fleshy.*

Subgenus 4. SARCOSCYPHA, Fr.—Fleshy. Veil villous.

36. P. (*Sarcoscypha*) *coccinea*, Jacq.; cup funnel-shaped, whitish externally, and clothed with short adpressed down; disc scarlet.—*Huss. i. t. 44; Grev. t. 171.*

On sticks. Spring. Local. Extremely beautiful. A curious variety has been sent by Lady Orde from Kilmory, orange externally, quite smooth, and nearly sessile.

37. P. (*Sarcoscypha*) *melastoma*, Sow.; cup fleshy; disc urceolate, black, clothed externally with red flocci; stem short, attached by dense strigose hairs.—*Sow. t. 149; Grev. t. 315.*

On sticks lying on the ground. Rare.

38. P. (*Sarcoscypha*) *radiculata*, Sow.; subcæspitose, fleshy, sessile, hemispherical, then flattened; disc sulphur-coloured, externally white, villous, as well as the thick root.—*Sow. t. 124.*

On the ground. Very rare.

39. P. (*Sarcoscypha*) *hemispherica*, Wigg; sessile, hemispherical, waxy, externally brownish, thickly covered with fasciculate hairs; disc white, with a glaucous tinge.—*Sow. t. 147.*

On the ground. Common.

40. P. (*Sarcoscypha*) *brunnea*, A. and S.; sessile, hemispherico-depressed, subflexuous, brown, rough externally with short fasciculate hairs: (*no. 309.*)

On the ground. Not common.

41. *hirta*, Schum. (*no. 768*). On the ground. Not uncommon.

42. *trechispora*, *B. and Br.*; *Ann. Nat. Hist.* xviii. p. 77. On the ground, in woods. Common. Scarcely to be distinguished from the last without the microscope.
43. *vitellina*, *P.* On the ground. Very rare.
44. *scutellata*, *L.*; *Sow. t.* 24. On stumps of trees. Common.
45. *cærulea*, *Bolt. t.* 108. *f.* 2. On trunks of firs.
46. *livida*, *Schum.* (no. 558). On chips.
47. *stercorea*, *P.*; *Sow. t.* 352. On cow-dung.
48. *albo-spadicca*, *Grev.* On the ground.

Subgenus 6. *DASYSCYPHA*, *Fr.*—Cup thin, waxy, dry. Disc smooth, externally pilose or villous. Hymenium thin. Substance subfloccose.

49. *ciliaris*, *Schrad.* (no. 559). On dead leaves.
50. *virginea*, *Batsch.* On stumps, twigs, etc.
51. *nivea*, *Fr.* On stumps, etc.
52. *calycina*, *Schum.* On twigs and bark of conifers.
53. *bicolor*, *Bull.* On dead twigs.
54. *cerinea*, *P.* On old rails, branches, etc.
55. *clandestina*, *Bull.* On dead bramble.
56. *caulicola*, *Fr.* (no. 310). On dead herbaceous stems.
57. *acuum*, *Fr.* On dead pine-leaves. Scotland, *Jerdon.*
58. *albo-violascens*, *A. and S.* On lilac, etc.\*
59. *corticalis*, *P.* (no. 311, 562). On dead bark.
60. *tricolor*, *Sow. t.* 369. *f.* 6. On bark.
61. *Godroniana*, *Mont. Syll.* p. 185. On bark.
62. *melaxantha*, *Fr.* On fallen branches.
63. *hispidula*, *Schrad.* On dead wood.
64. *Schumacheri*, *Fr.*; *Grev. t.* 11. On dead wood.
65. *rufo-olivacea*, *A. and S. t.* 11. *f.* 4. On dead bramble.
66. *varicolor*, *Fr.*; *Sow. t.* 178. On rotten wood.
67. *episphæria*, *Mart.* On *Hypoxylon multiforme*.

\* Mr. Jerdon finds a plant very closely resembling this on *Ulex*, with the fruit of a *Cyphella*. It is probably a sporiferous condition.

68. *Pineti*, *Batsch*. On fir-cones.  
 69. *papillaris*, *Bull.*; *Sow. t.* 177. On dead wood.  
 70. *hyalina*, *P.* On stumps of trees.  
 71. *sulphurea*, *P.*; *Grev. t.* 83. On dead nettles, etc.  
 72. *plano-umbilicata*, *Grev.* On dead nettles.  
 73. *villosa*, *P.* On large dead *Herbacea*, as burdock.  
 74. *Grevillei*, *B. Engl. Fl. l. c. p.* 198. On dead *Umbelliferae*.  
 75. *Berkeleyi*, *Blox. (no. 770)*. On dead *Umbelliferae*.  
 76. *aspidiicola*, *B. and Br. (no. 771)*. On *Filix-mas*.  
 77. *albo-testacea*, *Desm.* On dead grass-leaves.  
 78. *apala*, *B. and Br. (no. 561)*. On dead rushes.  
 79. *Clavariarum*, *Desm. (no. 563)*. On decaying *Clavariæ*.  
 80. *straminum*, *B. and Br. (no. 561)*. On wheat, etc.\*

Subgenus 7. *TAPESIA*, *Fr.*—Cups waxy or subcoriaceous, crowded into a sort of crust-like stratum, or sitting on a tomentose subiculum.

81. *anomala*, *P.* On rails, etc.  
 82. *aurelia*, *P.*; *Grev. t.* 139. On dead leaves, etc.  
 83. *domestica*, *Sow. t.* 351. On whitewashed walls.  
 84. *Piggottii*, *B. and Br. (no. 769)*. On plaster ceilings.  
 85. *cæsia*, *P.* On chips.  
 86. *Chavetiæ*, *Lib. (no. 565)*. On chips.  
 87. *eribasis*, *B. (no. 312)*. On dead bark.  
 88. *Bloxami*, *B. and Br. (no. 566)*. On chips, etc.  
 89. *mutabilis*, *B. and Br. (no. 564)*. On *Aira cæspitosa*.  
 90. *Rosæ*, *P. (no. 10)*. On rose, sycamore, etc.  
 91. *fusca*, *P.*; *Grev. t.* 192. On branches of various trees.  
 92. *Johnstoni*, *B. (no. 313)*. On fallen branches.  
 93. *sanguinea*, *P. (no. 11)*. On fir.

\* *Peziza amorpha*, *P.*, is referred by Fries to *Corticium*, but it has perfect asci. As I have not seen fresh specimens, I cannot determine to what genus it belongs.

Subgenus 8. FIBRINA, *Fr.*—Waxy or subcoriaceous, dry, at length smooth, at first marked with adpressed hairs. Margin torn or toothed.

94. *rudis*, *B.* (no. 574). On shallow gravel and peat.  
 95. *bolaris*, *Batsch*; *Sow. t.* 369. *f.* 5. On willow.  
 96. *siparia*, *B. and Br.* (no. 772). On elm.  
 97. *Ledi*, *A. and S. t.* 10. *f.* 7 (no. 160). On *Arbutus Uca-ursi*.

Series 3. PHIALEA, *Fr.*—*Veil none. Cups waxy or membranaceous, quite smooth (or very rarely mealy or subtomentose), soon open. Subiculum none.*

Subgenus 9. HYMENOSCYPHA, *Fr.*—Cup submembranaceous, distinctly stipitate. Hymenium distinct, thicker than the walls of the cup.

98. *firma*, *P.*; *Sow. t.* 115. On sticks.  
 99. *ciborioides*, *Fr.* (no. 158). On dead leaves.  
 100. *echinophila*, *Bull. t.* 500. *f.* 11 (no. 567). On chestnut-husks.  
 101. *coronata*, *Bull. t.* 416. *f.* 4. On stalks of plants.  
 102. *inflexa*, *Bolt. t.* 106. *f.* 2; *Sow. t.* 306. On dead nettles.  
 103. *striata*, *Fr.* (no. 568). On dead stems.  
 104. *Cacalix*, *Fr.* (no. 569). On the common stock.  
 105. *nitidula*, *B. and Br.* (no. 570). On *Aira cæspitosa*.  
 106. *cyathoides*, *Bull.*; *Sow. t.* 369. *f.* 1. On dead herbaceous stems.  
 107. *caucus*, *Reb. t.* 4. *f.* 17 (no. 572). On fallen catkins.  
 108. *Curreyi*, *B.*; *Journ. Linn. Soc. i. p.* 147. On dead *Juncus*.

Subgenus 10. MOLLISIA, *Fr.*—Freely evolved, smooth. Cups turbinato-stipitate or sessile, soft and waxy.

109. *clavus*, *A. and S.* (no. 575). On leaves, etc., in swamps.  
 110. *vinosa*, *A. and S.* On fallen branches.  
 111. *atro-virens*, *P.* On decaying wood.  
 112. *cincrea*, *Batsch.* On decaying wood, etc.

113. *Chailletii*, *P.* On dead herbaceous stems.  
 114. *sphærioides*, *P.* (no. 577). On *Lychnis dioica*.  
 115. *axillaris*, *Nees*. On *Splachnum mnioides*.  
 116. *xanthostigma*, *Fr.* On fir-wood.  
 117. *leucostigma*, *Fr.* On soft rotten wood.  
 118. *vulgaris*, *Fr.* On fallen branches.  
 119. *crumpens*, *Grev. t.* 99. On sycamore-petioles.  
 120. *atrata*, *P.* On dead herbaceous stems.  
 121. *cornea*, *B. and Br.* (no. 578). On *Carex paniculata*.  
 122. *fusarioides*, *B.* (no. 12). *P. neglecta*, *Lib.* On dead nettle-stems.  
 123. *micrometra*, *B. and Br.* (no. 773). On dead rushes.

Subgenus 11. *PATELLEA*, *Fr.*—Cup sessile, at first subinnate, but scarcely erumpent, waxy but tough, flattened, open, orbicular, marginate, dry, lichenoid.

124. *melanotheja*, *Fr. Ind. Alph.* On oak-branches.  
 125. *compressa*, *A. and S.* On dead wood.  
 126. *lignyota*, *Fr.* (no. 579). On dead wood.  
 127. *flexella*, *Fr.* On dead wood.  
 128. *lccideola*, *Fr.* On dead wood.

## 252. HELOTIUM, *Fr.*

Disc always open, at first punctiform, then dilated, convex or concave, naked. Excipulum waxy, free, marginate, externally naked.

Subgenus 1. *PELASTEIA*, *Fr.*—Disc convex. Receptacle hollow beneath or flattened.

1. *fibuliforme*, *Fr.*; *Boll. t.* 176. On elm.  
 2. *agaricinum*, *B.* On decayed wood.  
 3. *sclerotoides*, *B.* On decayed wood.  
 4. *aciculare*, *Fr.* On old stumps.  
 5. *subtile*, *Fr.* On dead fir-leaves.

6. *æruginosum*, *Fr.*; *Sow. t.* 347; *Grev. t.* 241. On fallen oak-branches.
7. *scrotinum*, *Fr.*; *Bolt. t.* 98. On sticks, etc., in watery pieces.
8. *virgultorum*, *Fr.* (*P. fructigena*, *Bull.*); *Sow. t.* 117. On twigs, acorns, etc.
- b. flavescens*, *Holmsk. t.* 11. On willow.
9. *lutescens*, *Fr.* (*no.* 826). On pine-branches.
10. *testaceum*, *B.* (*no.* 576). On decaying linen.
11. *conigenum*, *Fr.* On cones of Scotch fir.
12. *phascoides*, *Fr.* On mosses.
13. *acuum*, *Fr.* On dead fir-leaves.

Subgenus 2. CALYCELLA, *Fr.*—At first turbinate. Disc concave.  
Stem firm when present.

14. *tuba*, *Fr.*; *Bolt. t.* 106. *f.* 1. On fallen branches.
15. *Buccina*, *Fr.* On fallen pine-branches.
16. *calyculus*, *Fr.*; *Sow. t.* 116. On fallen branches.
17. *Aspegrenii*, *Fr.*; *Sow. t.* 369. *f.* 7. On wood.
18. *citrinum*, *Fr.*; *Sow. t.* 150. On old stumps.
19. *pallescens*, *Fr.* On old stumps.
20. *lenticulare*, *Fr.* On old stumps.
21. *ochraceum*, *B.*; *Grev. t.* 5. On old stumps.
22. *cribrosum*, *B.* *P. cribrosa*, *Grev.* On sandy or gravelly ground.
23. *claro-flavum*, *B.* (*Peziza*, *Grev.*) On decayed wood.
24. *salicellum*, *Fr.* (*no.* 573). On willow.
25. *versiforme*, *Fr.* (*no.* 159). (Plate 2, fig. 6.) On ash-stumps.
26. *subsessile*, *Schum.* (*Pez. helotioides*, *Fr.*) (*no.* 573). On wood.
27. *herbarum*, *Fr.* On dead leaves.
28. *epiphyllum*, *Fr.* On dead leaves.
29. *fagineum*, *Fr.* On decayed twigs, straws, etc.
30. *punctatum*, *Fr.*; *Grev. t.* 63. On dead oak-leaves.
31. *Marchantiaë*, *Fr.* (*Peziza*, *B.*) On fading *M. hemisphærica*.

253. **PSILOPEZIA**, *B.*

Indeterminate, immarginate, agglutinate. Hymenium always exposed.

1. *Babingtonii*, *B.* (no. 554). On rotten wood.

254. **PATELLARIA**, *Fr.*

Receptacle patellæform, margined, always open. Hymenium even, subsistent, but dusty from the breaking up of the asci. Asci fixed.

1. *atrata*, *Fr.* On dead wood.
2. *rhabarbarina*, *B.* (no. 89). On dead bramble.\*
3. *citrina*, *B. and Br.* (no. 583). On rose-twigs, in a running stream.
4. *clavispora*, *B. and Br.* (no. 774). On privet.
5. *livida*, *B. and Br.* (no. 775). On fallen fir-trees.
6. *discolor*, *Mont.* On fallen branches.

255. **SPHINCTRINA**, *Fr.*

Excipulum almost horny, naked, pierced with a narrow, quite entire mouth. Disc at length dusted with the sporidia.

1. *turbinata*, *Fr.*; *Sow. t.* 386. *f.* 1. On *Pertusaria*.

256. **LAQUEARIA**, *Fr.*

Disc waxy, persistent, without any hypothecium, but covered with a horny, coriaceous, dimidiate, superior, deciduous excipulum. Mouth contracted.

1. *sphaeralis*, *Fr.* *Stictis sphaeralis*, *Syst. Myc.* On ash.

257. **TYMPANIS**, *Tode.*

Receptacle margined, cyathiform, horny. Hymenium at first veiled, then breaking up.

\* This belongs to Fries' genus *Lachnella*, but as he himself is uncertain as to its immediate affinities, I think it better to leave it in *Patellaria*.

1. *alnea*, *P.* On alder.
2. *Fraxini*, *Schwein.* On ash.
3. *conspersa*, *Fr.*; *Grev. t.* 335. On apple, hawthorn, etc.
4. *saligna*, *Tode* (no. 584). On privet.

#### 258. CENANGIUM, *Fr.*

Receptacle coriaceous, closed at first, then open, marginate, covered with a thick cuticle. Hymenium persistent.

1. *Ribis*, *Fr.* (no. 585). On currant.
2. *Cerasi*, *Fr.* On wild cherry.
3. *Prunastri*, *Fr.* On sloe.
4. *Aucupariæ*, *Fr.* On mountain ash.
5. *pulveraceum*, *Fr.* On wood.
6. *fuliginosum*, *Fr.* On willow.
7. *ferruginosum*, *Fr.* (no. 161). On pine-branches cut green.
8. *quercinum*, *Fr.* On oak-twigs.
9. *Rubi*, *Fr.*; *Grev. t.* 334. On raspberry.

#### 259. ASCOBOLUS, *Tode.*

Receptacle orbicular, marginate. Disc patellæform. Asci exploded.

1. *furfuraceus*, *P.*; *Grev. t.* 307. On cow-dung.
2. *vinosus*, *B.* (Plate 23, fig. 4.) On rabbit-dung.
3. *ciliatus*, *Schm.* On cow-dung.
4. *glaber*, *P.* On cow-dung.
5. *Trifolii*, *Bernh.* On half-dead clover-leaves.
6. *carneus*, *P.* On cow-dung.
7. *saccharinus*, *B. and Curr.* On old leather.

#### 260. BULGARIA, *Fr.*

Receptacle orbicular, then truncate, glutinous within, at first closed. Hymenium even, persistent, smooth.

1. *inquinans*, Fr. (Plate 22, fig. 7.) On oak-trunks, etc.
2. *sarcoides*, Fr. (Plate 18, fig. 6.) On old stumps.

### 261. AGYRIUM, Fr.

Receptacle compact, homogeneous, waxy, gelatinous when moist, innate, sessile, sphaerical, even, smooth, and fructifying all round. Asci fixed.

1. *rufum*, P.; Grev. t. 232. On old, dry fir-wood.

### 262. STICTIS, P.

Receptacle obsolete. Hymenium even, determinate, orbicular and elliptic, immersed in the matrix, at first veiled.

Subgenus 1. EUSTICTIS.—Often margined, suborbicular. Hymenium persistent.

1. *radiata*, P.; Grev. t. 227. On wood, twigs, etc.
2. *pallida*, P. On wood.
3. *microstoma*, Carm. On wood.
4. *nivea*, P. (no. 167). On fir-leaves.
5. *lichenicola*, Mont. (no. 163). On foliaceous *Cenomyces*.
6. *hysterioides*, Desm. (no. 314). On *Carices*.

Subgenus 2. XYLOGRAPHA.—Elliptic or elongated. Hymenium deliquescent.

7. *parallela*, Fr. On dead fir-wood.
8. *longa*, Fr. On wood.

Subgenus 3. PROPOLIS.—Waxy, firm, round or irregular. Hymenium even, at length dusty.

9. *versicolor*, Fr. On pales, sticks, fir-cones, etc.
10. *phacidioides*, Fr. (no. 162). On *Arbutus Uva-ursi*.
11. *Wauchii*, B.; Grev. t. 206. On willow-branches.

263. ASCOMYCES, *Mont. and Desm.\**

Parasitic. Receptacle none. Asci forming a thin, pulverulent stratum, mixed with moniliform threads.

1. bullatus, *B.* On pear-leaves.
2. deformans, *B.* On peach-leaves, causing one form of blister.
3. Trientalis, *B.* On leaves of *T. Europæa*.
4. Juglandis, *B.* (*Gymnosporium leucospermum, Mont.*) On walnut-leaves.

## ORDER 24. TUBERACEI.

Hypogæous. Hymenium waved and sinuate, often intricate and closely packed.

264. TUBER, *Mich.*

Asci short, saccate, disposed in sinuous veins. Sporidia elliptic, reticulate, often echinulate. Peridium warty or tubercled, rarely smooth, without any definite base.

1. brumale, *Mich.*; *Ann. Nat. Hist. t. 18. p. 80: (no. 320.)*
2. æstivum, *Vitt.* (Plate 23, fig. 2.) The common truffle of our markets.
3. macrosporum, *Vitt. (no. 580.)*
4. bituminatum, *B. and Br. (no. 586.)*
5. rufum, *Pico (no. 322.)*
6. scleroneuron, *B. and Br. (no. 582.)*
7. nitidum, *Vitt. (no. 321.)*
8. puberulum, *B. and Br.; Ann. Nat. Hist. l. c. p. 81.*
9. dryophilum, *Tul. l. c. p. 80.*

\* This appears to be the lowest form under which *Discomycetes* can appear, the way being made for it by *Propolis*. In outward aspect it has little resemblance to more typical genera.

265. **CHOIROMYCES**, *Vitt.*

Common integument, even. Base definite. Asci clavate. Sporidia spherical.

1. meandriformis, *Vitt.*; *Ann. Nat. Hist.* xviii. p. 80; *Sow. t.* 310.

266. **AMYLOCARPUS**, *Curr.*

Common integument thick, convolute. Asci soon absorbed, saccate. Sporidia globose, clothed with radiating threads, amylaceous.

1. encephaloides, *Curr. Pro. Roy. Soc. Jan.* 1858. On chips, Swansea.

267. **PACHYPHLŒUS**, *Tul.*

Common integument warty, opening by a terminal aperture. Base distinct. Asci clavate. Sporidia spherical.

1. melanoxanthus, *Tul.* (no. 319).
2. citrinus, *B. and Br.*; *Ann. Nat. Hist.* xviii. p. 79.
3. conglomeratus, *B. and Br. l. c.*

268. **STEPHENSIA**, *Tul.*

Common integument fleshy, cottony. Base distinct. Hymenium intricate. Asci cylindrical. Sporidia globose, even, at length verrucose.

1. bombycina, *Tul.* (no. 316).

269. **HYDNOTRYA**, *B. and Br.*

Common integument minutely papillose, not distinct. Hymenium complicated with gyrose lacunæ, leading to the surface. Asci oblong. Sporidia globose, tuberculate.

1. Tulasnei, *B. and Br.*; *Ann. of Nat. Hist.* xviii. p. 78.

270. **HYDNOBOLITES**, *Tul.*

Integument replaced by white, evanescent down. Hymenium

complicated with sinuous lacunæ, ending at the surface. Asci elliptic. Sporidia globose.

1. cerebriformis, *Tul.*; *B. and Br. l. c.*

#### 271. SPHÆROSOMA, *Kl.*

Common integument altogether wanting. Hymenium exposed, even or rugose, solid or lacunose. Asci linear. Sporidia spherical.

1. ostiolatum, *Tul.*; *Ann. Nat. Hist.* xviii. p. 79.

#### 272. BALSAMIA, *Vitt.*

Common integument warty. Hymenium complicated with distinct lacunæ not leading to the surface. Sporidia cylindrical or oblongo-elliptic, even, pellucid.

1. platyspora, *B. and Br. (no. 318).*

#### 273. GENEÆ, *Vitt.*

Common integument warty, with an aperture at the apex. Hymenium waved and sinuated, but not forming an intricate mass. Asci cylindrical. Sporidia globose.

1. verrucosa, *Vitt.*; *Ann. Nat. Hist.* xviii. p. 78.
2. Klotzschii, *B. and Br. l. c.*
3. papillosa, *Vitt. l. c. p. 76.*

#### 274. ELAPHOMYCES, *Nees.*

Common integument thick, hard. Asci globose or obovate. Sporidia consisting of several concentric utracles. Internal mass of Fungus at length dusty.

1. anthracinus, *Vitt. (no. 81).*
  2. variegatus, *Vitt. (no. 212, E. muricatus).* (Plate 23, fig. 3.)
  3. granulatus, *Fr. (no. 211).*
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## ORDER 25. PHACIDIACEI.

Receptacle more or less coriaceous or carbonaceous. Disc at length exposed by the regular or irregular fissure of the outer coat.

275. PHACIDIUM, *Fr.*

Perithecium bursting irregularly in the centre, by valvular teeth.

1. Pini, *Schn.* On pine-branches.
2. carbonaceum, *Fr.* On willow.
3. Vaccinii, *Fr.* On *Vacc. Vitis-idea*.
4. coronatum, *Fr.* (no. 58). On dead oak-leaves.
5. dentatum, *Fr.* On dead oak-leaves.
6. Rubi, *Fr.* (no. 586). On dead bramble-stems.
7. repandum, *Fr.* On various living herbs.

276. HETEROSPHÆRIA, *Grev.*

Perithecium globoso-depressed, thin, black, at length open above and irregularly torn. Disc thick, placentaform.

1. patella, *Grev. t.* 103. On dead herbaceous stems.

277. RHYTISMA, *Fr.*

Perithecia forming a confluent mass, opening by flexuous fissures.

1. maximum, *Fr.*; *Sow. t.* 356. On willow.
2. Andromedæ, *Fr.* On *Andromeda polifolia*.
3. salicinum, *Fr.*; *Grev. t.* 118. *f.* 2. On willow-leaves.
4. acerinum, *Fr.*; *Grev. t.* 118. *f.* 1. On sycamore- and maple-leaves.
5. punctatum, *Fr.* On sycamore-leaves.
6. Urticæ, *Fr.* On dead nettle-stems.

278. TRIBLIDIUM, *Reb.*

Perithecium labiate, splitting from the centre towards the circumference.

1. caliciiiforme, *Reb.* (no. 775). On oak-wood.

### 279. HYSTERIUM, *Tode.*

Perithecium labiate; border entire; orifice narrow-linear.  
Asci elongated.

1. pulicare, *P.*; *Grev. t.* 167. *f.* 1. On dead wood.
2. elongatum, *Wahl.* On dead wood.
3. curvatum, *Fr.* (no. 587). On dead rose and bramble.
4. lineare, *Fr.*; *Grev. t.* 167. *f.* 2. On dead wood.
5. Carmichaelianum, *B.*; *Grev. t.* 233. On smooth oak-bark.
6. Fraxini, *P.*; *Grev. t.* 72. On dead ash-twigs.
7. conigenum, *Moug. and Nest.* On cones of Scotch fir.
8. Vaccinii, *Carm.* On stems of *Vacc. Myrtillus.*
9. Rubi, *P.*; *Grev. t.* 24. On dead bramble.
10. Pinastri, *Schrad.*; *Grev. t.* 60, 26. On fir- and juniper-leaves.
11. melaleucum, *Fr.*; *Grev. t.* 88. On dead leaves of *Vaccinium Vitis-  
idæa.*
12. commune, *Fr.* (no. 588). On dead herbaceous stems.
13. typhinum, *Fr.* (no. 589). On dead *Typha latifolia.*
14. arundinaceum, *Schrad.* On dead reeds.
15. culmigenum, *Fr.*; *Grev. t.* 87. On dead grasses.
16. maculare, *Fr.*; *Grev. t.* 129. *f.* 2. On leaves of *Vaccinium.*
17. follicola, *Fr.*; *Grev. t.* 129. *f.* 1. On oak and ivy-leaves.

### 280. AILOGRAPHUM, *Lib.*

Perithecia branched, opening with a narrow-linear fissure.  
Asci subglobose.

1. amplum, *B. and Br.* (no. 782).

### 281. ASTERINA, *Lév.*

Perithecia semiorbicular, seated on a byssoïd mycelium;  
mouthless, at length splitting irregularly. Asci short, mostly  
subglobose.

1. *Babingtonii*, *B.* *Strigula Babingtonii*, *Eng. Bot. t.* 2957. On living box-leaves.

282. **LOPHIUM**, *Fr.*

Perithecia stipitate, wedge-shaped, opening with a narrow, longitudinal fissure. Asci elongated.

1. *elatum*, *Grev. t.* 177. *f.* 2. On fir-wood.  
 2. *mytilinum*, *Fr.*; *Grev. t.* 177. *f.* 1. On fir-wood.

283. **STEGIA**, *Fr.*

Perithecium orbicular, splitting horizontally; operculum deciduous.\*

1. *Ilicis*, *Fr.* On holly-leaves.

284. **TROCHILA**, *Fr.*

Disc innate, erumpent, placed upon a black hypothecium, persistent.

1. *Craterium*, *Fr.* *Sphæria Craterium*, *DC.* On box-leaves.  
 2. *Lauro-Cerasi*, *Fr.* *Phacidium*, *Desm.* On leaves of the common Portugal Laurel.

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ORDER 26. *SPHÆRIACEÆ.*

Perithecia carbonaceous or membranaceous, sometimes confluent with the stroma, pierced at the apex, and mostly papillate. Hymenium diffluent.

285. **CORDICEPS**, *Fr.*

Stroma vertical, fleshy. Fructifying head distinct, hyaline or coloured. Sporidia repeatedly divided, submoniliform.

\* As far as *Stegia Ilicis* is concerned, this genus is possibly not different from *Trochila*, *Fr.*

1. *C. militaris*, *Fr.*; clavate, bright scarlet; head tuberculated; stem equal. (Plate 23, fig. 6.)

On pupæ of moths, buried in the ground. Not uncommon.

2. *C. entomorrhiza*, *Fr.*; head subglobose, brown; stem slender. (Plate 23, fig. 5.)

On pupæ and larvæ of moths, buried in the ground. Rare.

3. *C. capitata*, *Fr.*; head ovate, globose, bay-brown or yellowish; stem yellow, at length blackish, erumpent.—*Sow. t.* 354.

In pine-woods, on *Elaphomyces granulatus*. Rare.

4. *C. ophioglossoides*, *Fr.*; head clavate, brownish-black; stem olive, black, rooting.

In woods, on *Elaphomyces muricatus*. Not common.

5. *C. gracilis*, *B.*; head roundish-ovate, even, brown; stem rooting, elongated, cylindrical, somewhat flexuous.—*Grev. t.* 86.

On the ground, in moist, mossy places. Shetland.

6. *C. purpurea*, *Fr.*; minute, pale purple; head subglobose; stem short, straight, downy at the base.—*Tul. Ann. d. Sc. Nat. sér. iii. vol. xx. t.* 3.

On grains of corn, which are converted by the mycelium into ergot.

7. *C. microcephala*, *Tul.*; minute; head globose; stem long, slender, flexuous.—*Tul. l. c. f.* 4, 5, *etc.*

On ergoted seeds of common reed. *Sph. Hookeri* probably belongs to this species.

8. *C. myrmecophila*, *B.*; ochraceous-white; stem thread-shaped, club ovoid, sterile below, ribbed above: (*no.* 591).—*Cesati in Rabenhorst, Exsic. n.* 1033.

On an *Ichneumon*. Leigh Wood, Bristol, *C. E. B.*

9. *C. alutacea*, *Fr.*; clavate, tan-coloured, or nearly white; head confluent with the stem. (Plate 23, fig. 6.)

In fir-woods, amongst leaves and on furze. Local.

286. HYPOCREA, *Fr.*

Stroma horizontal. Perithecia tender, hyaline or coloured.

1. *H. gelatinosa*, *Fr.*; convex, equal, opaque, dirty-white within; perithecia prominent, darker than the stroma.

On fir. Appin, *Capt. Carmichael*. Variable in colour, yellow, green, umber, pallid, etc.

2. *H. rufa*, *Fr.*; convex, irregular, red-brown, dirty-white within, wrinkled when dry; ostiola slightly prominent.

On oak, etc. Not uncommon.

3. *H. riccioidea*, *B.*; large, fleshy, deeply lobed, orange: (*no.* 95.)—*Bolt. t.* 182.

On willow. Very rare. I have French specimens from Dr. Montagne.

4. *H. Vitalba*, *B. and Br.*; brown, convex, sometimes slightly lobed, confluent; perithecia ovate; ostiola obsolete; sporidia fusiform, triseptate, appendiculate: (*no.* 829, *with a fig.*)

On *Clematis Vitalba*. Batheaston.

5. *H. citrina*, *Fr.*; fleshy, forming a thin, lemon-coloured stratum, dotted with the ostiola.—*Grev. t.* 215.

On leaves, wood, etc. Rare.

6. *H. lateritia*, *Fr.*—*Merulius helvelloides*, *Sow. t.* 402.

On Fungi. Rare.

7. *H. luteo-virens*, *Fr.* (*no.* 594); *Grev. t.* 78.

On Fungi. Rare.

8. *H. farinosa*, *B. and Br.* (*no.* 592).

On fallen branches.

9. *H. floccosa*, *Fr.* (*no.* 593).

On *Lactarius torminosus*.

10. *H. typhina*, *B.*; *Grev. t.* 204.

On living grasses.

287. **ENDOTHIA**, *Fr.*

Red or tawny. Perithecia irregular, pallid, cellular. Asci diffluent.

1. **E. gyrosa**, *Fr.* (*Sphaeria fluens*, *Sow.*); subrotund, confluent, orange, vermilion; stroma yellowish; perithecia gyrose, pulverulent, at length slightly prominent.

On bark. New Forest.

288. **XYLARIA**, *Schrank.*

Vertical, more or less stipitate. Stroma between fleshy and corky, covered with a black or rufous bark.

1. **X. polymorpha**, *Grev.*; subcarnose, gregarious, turgid, irregular, dirty-white, then black; receptacle bearing perithecia in every part.—*Grev. t.* 237.

On old stumps. Not uncommon.

2. **X. digitata**, *Grev.*; between fleshy and corky, tufted; heads cylindrical, reddish-brown, then black; tips barren, acute; stem smooth.—*Bull. t.* 220.

On wooden structures and stumps. Not common.

3. **X. corniformis**, *Mont.*; corky, brittle, simple, cylindrical, curved, black, covered on all sides with perithecia; base sub-tuberosus, villous.

On fallen branches. Rare. Lancashire.

4. **X. Hypoxylon**, *Grev.*; corky, simple or branched, compressed, at first pulverulent with white meal, then naked; stem villous. (Plate 24, fig. 4.)—*Sow. t.* 55.

On stumps of trees, sticks, etc. Extremely common.

5. **X. carpophila**, *Fr.*; corky, slender, simple; head subulate, albido-pulverulent, at length black; stem very long, root-like.

On beech-mast. Very common.

6. *X. pedunculata*, *Fr.*; corky, slender, simple, springing from a sclerotoid base; head ovate or subglobose: (*no.* 93.)—*Sow. t.* 437.

On soil, mostly attached to dung. Not common.

7. *X. bulbosa*, *B. and Br.*; corky, simple or forked, brown, then black; stem cylindrical, bulbous at the base and spongy. (*Plate* 24, *fig.* 2.)—*Pers. Obs.* ii. *t.* 1. *fig.* 1.

Amongst fir-leaves. Rare. Bath, *C. E. B.*

### 289. THAMNOMYCES, *Ehrb.*

Stem shrubby or simple. Perithecia formed of the same substance as the stem.

1. *T. hippotrichioides*, *Ehrb.*; branched, thread-shaped; perithecia scattered, papillate: (*no.* 94.)—*Sow. t.* 200.

On old sacks, matting, etc. Not common.

### 290. PORONIA, *Fr.*

Between fleshy and corky. Fructifying surface margined, orbicular. Perithecia immersed, vertical.

1. *P. punctata*, *Fr.*; stipitate, turbinate, externally blackish; disc truncate, dotted with the black ostiola.—*Grev. t.* 327; *Sow. t.* 54.

On horse- and cow-dung. Not uncommon.

### 291. HYPOXYLON, *Bull.*

Stroma corky or brittle, convex or plane, immarginate, at first clothed with a floccose veil, then with a black crust, distinct from the matrix. Perithecia vertical or divergent.

#### a. *Globosæ.*

1. *H. ustulatum*, *Bull.*; effused, thick, undulated, rugose, pulverulent when young, whitish, cinereous in the centre, at

length rigid; perithecia ovate, furnished with a short neck. (Plate 24, fig. 3.)

On rotten trunks. Common.

2. *H. nummularium*, *Bull.*; determinate, quite plane, externally and internally black; perithecia immersed, ovate; ostiola globose, slightly prominent.—*Bull. t.* 468. *f.* 4.

On wood and bark. Not common.

3. *H. luteum*, *Fr.*; orbicular, cup-shaped, black; disc bordered, wrinkled; stroma yellow, pulverulent; perithecia in many rows, emergent: (*no.* 170.)

On elder. Rare.

4. *H. succenturiatum*, *Fr.*; oblongo-pulvinate, immarginate, even, black, greyish-brown within; perithecia ovate, scattered, irregularly emergent: (*no.* 830.)

On oak-branches. Rare.

5. *H. gastrinum*, *Fr.*; ventricose, crumpled; stroma pallid; perithecia scattered irregularly, necks included; disc nearly plane, black: (*no.* 598.)—*Sow. t.* 374. *f.* 9.

On elm. Not uncommon.

b. *Pulvinate.*

6. *H. concentricum*, *Grev.*; large, subglobose, brownish, at length black, concentrically zoned within.—*Bolt. t.* 180; *Sow. t.* 160; *Grev. t.* 324.

On old ash-trees. Common.

7. *H. coccineum*, *Bull.*; globose, vermilion-brown, bright black within; perithecia ovate; ostiola at length prominent.—*Grev. t.* 136; *Sow. t.* 374.

On beech, etc. Very common.

8. *H. multiforme*, *Fr.*; irregular, at first rugose, rusty-brown, at length naked, black, cinereous-black within; perithecia at length prominent, papillate. (Plate 24, fig. 4.)—*Sow. t.* 355; *Grev. t.* 114.

On birch, etc. Very common. Sometimes elliptic.

9. *H. marginatum*, *B.*; hemispherical, confluent, at length black, of the same colour within; each ostiolum seated in a little margined disc: (*no.* 595.)—*Schwein. Journ. of Ac. t. 2. f. 8.*

On decaying wood of British growth, in the conservatory at Chatsworth.

10. *H. cohærens*, *Fr.*; confluent, convexo-plane, at first even, dirty-brown, then black within; perithecia at length rather prominent, papillate.

On dead branches. Not common.

11. *H. argillaceum*, *Fr.*; subglobose, clay-coloured, brown-black within; perithecia slightly prominent, papillate: (*no.* 169.)—*Fr. Obs. i. t. 2. f. 5.*

On dead ash-branches. Not uncommon.

12. *H. fuscum*, *Fr.*; convex, pulvinate, purple-brown, at length naked, black, black-brown within; ostiola umbilicate.—*Sow. t. 373. f. 9.*

On hawthorn, hazel, etc. Very common.

*c. Effusæ.*

13. *rubiginosum*, *Fr.* On decorticated trunks, etc.

14. *atro-purpureum*, *Fr.* On rotten wood, rare.

15. *serpens*, *Fr.*; *Sow. t. 373. f. 10; 372. f. 11.* On dead wood.

16. *coprophilum*, *Fr.* (*no.* 596). On dung.

17. *udum*, *Fr.* On rotten branches.

292. **DIATRYPE**, *Fr.*

Stroma partly formed from the matrix, and not distinct from it; perithecia sunk, elongated above into a distinct neck, and frequently rostrate.

*a. Lignosæ.*

1. *bullata*, *Fr.*; *Bolt. t. 122. f. 1.* On willow.

2. undulata, *Fr.* (no. 831). (*Grev. t.* 223. *f.* 1, is doubtful.) On dead branches.
3. stigma, *Fr.*; *Grev. t.* 223. *f.* 2; *Sow. t.* 137. On dead sticks.
4. disciformis, *Fr.*; *Grev. t.* 314. On dead sticks, especially beech.
5. aspera, *Fr.* On oak.
6. favacea, *Fr.* (no. 17). On birch.
7. verrucæformis, *Fr.*; *Sow. t.* 374. *f.* 4. On dead sticks.
8. lanciformis, *Fr.*; *Sow. t.* 371. *f.* 6. On birch.
9. quercina, *Fr.* (no. 839). On dead oak-branches.
10. dryophila, *Curr.* (no. 832). On oak-twigs.
11. nucleata, *Curr.* (no. 833). On furze.
12. varians, *Curr.* (no. 834). On dead twigs.
13. denigrans, *Curr.* (no. 835).
14. Badhami, *Curr.* (no. 836).
15. inæqualis, *Curr.* (no. 837). On furze.

b. *Versatiles.*

16. scabrosa, *Fr.* (no. 171). On maple.
17. Ulicis, *B.* (no. 599). On furze.
18. podoides, *Fr.* (no. 600). On dead branches.
19. ferruginea, *Fr.* On hazel.
20. flavo-virens, *Fr.*; *Grev. t.* 320. On bark or naked wood.
- β. multiceps, *Sow. t.* 394. *f.* 8.
21. sordida, *B. and Br.* (no. 838). On oak-twigs.
22. Hystrix, *Fr.* (no. 840). On sycamore, etc.
23. ccratosperma, *Fr.* On rose, oak, etc.
24. strumella, *Fr.* On gooseberry and currant.
25. pyrrocystis, *B. and Br.* (no. 841, with a *fig.*). On hazel.

c. *Effusæ.*

26. incarcerationata, *B. and Br.* (no. 842). On rose.
27. stipata, *Curr.* (no. 843). On elm.
28. elevata, *B. and Br.* (no. 844). On *Euonymus*.
29. leioplaca, *Fr.*; *Sow. t.* 374. *f.* 1. On wood and dry branches.
30. lata, *Fr.* On dead wood. Very variable.

31. *decepiens*, *Fr.* ; *Sow. t.* 297. On hornbeam.

d. *Circumscriptæ.*

32. *corniculata*, *B. and Br.* (no. 845). On dead branches.

33. *cineta*, *B. and Br.* (no. 846). On dead twigs.

293. **VALSA**, *Fr.*

*Perithecia carbonaceous*, perfect, circinating, elongated into converging necks ; ostiola erumpent, joined together, or ending in a common disc.

1. *Prunastri*, *Fr.* On dead sloe.

2. *stellulata*, *Fr.* On dead elm-branches.

3. *enteroleuca*, *Fr.* On dead branches.

4. *extensa*, *Fr. b.* *Rhamni*. On dead *Rhamnus catharticus*.

5. *syngenesia*, *Fr.* (no. 847). On dead elder.

6. *Cratægi*, *Curr.* (no. 848). On dead hawthorn-twigs.

7. *detrusa*, *Fr.* (no. 18). On dead berberry.

8. *fibrosa*, *Fr.* On dead blackthorn.

b. *Incusæ.*

9. *nivea*, *Fr.* ; *Sow. t.* 372. *f.* 7. On dead poplar, hawthorn, etc.

10. *leucostoma*, *Fr.* On dead sloe.

11. *Kunzei*, *Fr.* (no. 601). On dead fir.

12. *angulata*, *Fr.* (no. 848). On dead *Cytisus Laburnum*.

13. *luteola*, *Fr.* On dead oak-branches.

14. *microstoma*, *Fr.* (no. 20). On dead sloe.

15. *profusa*, *Fr.* On dead *Robinia*.

16. *dissepta*, *Fr.* (no. 173). On various dead branches.

17. *controversa*, *Fr.* (no. 602). (*Sphæria*, *Desm.*) On various dead branches.

18. *dryina*, *Curr.* (no. 850). On dead oak-branches.

19. *concamerata*, *Curr.* (no. 867). On dead oak-twigs.

c. *Obovataæ.*

20. *coronata*, *Fr.* On dead oak, rose, hawthorn, etc.

21. *Abietis*, *Fr.* On dead fir.
22. *chrysostroma*, *Fr.* (no. 22). (*Sp. xanthostroma*, *Mont. no. 861, with a fig.*). On hazel.
23. *suffusa*, *Fr.* = *Sp. Cryptosporii*, *Curr. Micr. Journ.* iii. p. 271.
24. *leiphæmia*, *Fr.* On dead oak-twigs.
25. *turgida*, *Fr.* On dead beech-twigs.
26. *salicina*, *Fr.* On dead willow-twigs.
27. *ambiens*, *Fr.* On dead hawthorn, crab, etc.
28. *stilbostoma*, *Fr.* On various dead branches.
29. *platanoides*, *B.* *S. platanoides*, *Auct.* On sycamore.
30. *platanigera*, *B. and Br.* (no. 851, *with a fig.*). On dead plane.
31. *tetratrupha*, *B. and Br.* (no. 852, *with a fig.*). On dead alder-twigs.
32. *fenestrata*, *B. and Br.* (no. 853, *with a fig.*). On dead oak-twigs.
33. *tetraploa*, *B. and Curt.* (no. 854). On dead sticks.
34. *rhodophila*, *B. and Br.* (no. 855). On dead rose-twigs.
35. *quernea*, *Curr.* (no. 856). On dead oak-twigs.
36. *biconica*, *Curr.* (no. 857). On dead branches.
37. *pulchra*, *Curr.* (no. 858). On dead branches.
38. *tetraspora*, *Curr.* (no. 859). On dead willow.
39. *intexta*, *Curr.* (no. 860). On dead oak.

d. *Circinatae.*

40. *pulchella*, *Fr.* ; *Grev. t. 67.* On dead cherry and birch.
41. *quaternata*, *Fr.* On dead beech.
42. *furfuracea*, *Fr.* On dead branches.
43. *hypodermia*, *Fr.* (no. 21 : no. 862\*, *with a fig.*). On dead elm.
44. *convergens*, *Fr.* On smooth bark.
45. *hapalocystis*, *B. and Br.* (no. 615, *with a fig.*). On dead plane-twigs.
46. *bitornlosa*, *B. and Br.* (no. 861, *with a fig.*). On dead hornbeam.
47. *agkæostoma*, *B. and Br.* (no. 862, *with a fig.*). On dead elm-twigs.
48. *Innesii*, *Curr.* (no. 863). On dead branches.
49. *faginea*, *Curr.* (no. 864). On dead beech-twigs.
50. *tiliaginea*, *Curr.* (no. 865). On dead lime-twigs.
51. *vestita*, *Fr.* (no. 866). On dead twigs.

## 294. MELOGRAMMA, Fr.

Perithecia confluent with the stroma, more or less free above, destitute of any neck; contents oozing out, and often forming cirrhi.

1. rubro-notatum, *B. and Br.* (no. 894). On dead elm-bark.
2. oligosporum, *B. and Br.* (no. 895, with a fig.). *S. macrospora*, *Desm.*  
On dead bark.
3. fusisporum, *Fr.* (*Moug. and Nest.* 274). On dead bark.
4. homaleum, *Fr. Exs.* 382. On dead bark.

## 295. DOTHIDEA, Fr.

Perithecia none. Nucleus contained in globose cavities, immersed in the stroma, with a decided neck and papillæform ostiolum.

1. tetraspora, *B. and Br.* (no. 899, with a fig.). On dead *Daphne Laureola* and *Ulex*.
2. ribesia, *P.* On dead currant- and gooseberry-branches.
3. Rosæ, *Fr.* *Sph. Dothidea*, *Fr.* On living rose-stems.
4. Piggottii, *B. and Br.* (no. 660). On *Parmelia saxatilis*.
5. filicina, *Fr.* On dead *Pteris aquilina*.
6. striæformis, *Fr.* On dead *Umbellifera*.
7. rubra, *P.*; *Grev. t.* 120. On living sloe-leaves.
8. fulva, *Holl. and Schm.* On living leaves of *Prunus Padus*.
9. Ulmi, *Fr.*; *Grev. t.* 200. *f.* 1. On half-dead elm-leaves.
10. betulina, *Fr.*; *Grev. t.* 200. *f.* 2. On living birch-leaves.
11. Heraclæi, *Fr.* On living leaves of *H. Sphondylium*.
12. Podagrariæ, *Fr.* On living leaves of *Ægopodium Podagraria*.\*
13. Trifolii, *Fr.* On living clover-leaves.
14. Junci, *Fr.* On half-dead stems and leaves of rushes.
15. Graminis, *Fr.* On half-dead leaves of grasses.

\* A *Sphæropsis*, according to Currey.

16. *Caricis*, *Fr.* (no. 604). On half-dead *Carices*.  
 17. *Johnstoni*, *B. and Br.* (no. 661). On leaves of *Epilobium*.

### 296. ISOTHEA, *Fr.*

Nucleus without any peritheccium, coloured or black, covered by the transformed substance of the matrix, or immersed in it.

1. *rhytismoides*, *Fr.* (no. 178, with a *fig.*). On leaves of *Dryas*.  
 2. *pustula*, *B.* (*Phoma*, *Fr.*) On oak-leaves.  
 3. *saligna*, *B.* (*Phoma*, *Fr.*) On willow-leaves.

### 297. HYPOSPILA, *Fr.*

Perithecia globose, black, mouthless, altogether innate, concealed by the blackened substance of the leaves, and when that falls away splitting across.

1. *quercina*, *Fr.* (*Sp. bifrons*). On dead oak-leaves.  
 2. *populina*, *Fr.* (*Sp. ceuthocarpa*). On dead poplar-leaves.

### 298. STIGMATEA, *Fr.*

Parasitic. Perithecia globose, black, innate, slightly prominent. Nucleus firm, at first mouthless, then bursting with a roundish aperture.

1. *conferta*, *Fr.* (no. 177). On *Vaccinium uliginosum*.  
 2. *Geranii*, *Fr.* (*Dothidea*). On *Geranium sylvaticum*.  
 3. *Ranunculi*, *Fr.* (*Dothidea*). On *Ranunculi*.  
 4. *Robertiani*, *Fr.* (*Grev. t.* 146. *f.* 1). On leaves of *Geranium Robertianum*.  
 5. *Polygonorum*, *Fr.* On leaves of *Polygona*.  
 6. *Alchemillæ*, *Grev.* (*Dothidea*). On *Alchemilla*.  
 7. *Chætomium*, *Fr.* (no. 200). *Dothidea Chætomium*, *Kze.* On raspberry-leaves.

299. OOMYCES, *B. and Br.*

Perithecia erect, contained in a polished coloured sac, which is free above. Ostiola punctiform, apical.

1. carneo-albus, *B. and Br.* (no. 590). *Sphæria*, *Libert.* On leaves of *Aira cæspitosa*.

300. NECTRIA, *Fr.*

Stroma none; or, if present, bearing the naked, coloured perithecia on its surface.

1. *Cæspitosæ.*

1. ochracea, *Fr.* (*Sphæria*, *Grev.*) On dead twigs.
2. cinnabarina, *Fr.*; *Grev. t.* 135. On dead twigs.
3. coccinea, *Fr.*; *Sow. t.* 255. On dead twigs.
4. cucurbitula, *Fr.* (no. 174, 609). On dead branches.
5. sinopica, *Fr.* (no. 97). On dead ivy.
6. aquifolia, *B.* On dead holly.
7. inaurata, *B. and Br.* (no. 781\*). On dead holly.
8. Ralfsii, *B. and Br.* (no. 780). On dead branches.

2. *Byssisedæ.*

9. aurantia, *Fr.*; *Grev. t.* 47. On decayed *Polypori*.
10. rosella, *Fr.*; *Grev. t.* 138. On decayed Fungi, etc.

There is a distinct species confounded with this, which has not hitherto been published.

3. *Villosæ.*

11. flavida, *Fr.* (no. 610). On decayed stumps.
12. funicola, *B. and Br.* (no. 611). On decayed rope.

4. *Denudatæ.*

13. *Peziza*, *Fr.* (Plate 24, fig. 6.) On decayed stumps, etc.
14. *Platasca*, *B.* On touchwood.

15. sanguinea, *Fr.*; *Grev. t.* 175. *f.* 1. On sticks, wood, *Hypoxyla*, etc.
16. epispæria, *Fr.*; *Grev. t.* 175. *f.* 2. *t.* 50. On *Hypoxyla*.
17. Purtoni, *Curr.* (*Grev. t.* 50). On *Valsa Abietis*.
18. ochraceo-pallida, *B. and Br.* (no. 607). On dead elm-branches.
19. muscivora, *B. and Br.* (no. 608). On mosses, which it soon destroys.
20. arenula, *B. and Br.* (no. 622, with a *fig.*). On *Aira cæspitosa*.
21. graminicola, *B. and Br.* (no. 897, with a *fig.*). On *Aira cæspitosa*.
22. Bloxami, *B. and Br.* (no. 781). On dead herbaceous stems.
23. Helminthicola, *B. and Br.* (no. 896). On *Helminthosporia*.
24. Rousseliana, *Mont.* (no. 898). On box-leaves.
  - b.* viridis. On box-leaves.
  - c.* fulva (no. 182). On box-leaves.
25. umbrina, *Fr.* On dead bean-stalks.

### 301. SPHÆRIA, *Hall.*

Perithecia black, pierced at the apex, mostly papillate, superficial or erumpent, without any stroma.

#### Series 1. SUPERFICIALES.

##### *a.* *Byssisedæ.*

1. thelena, *Fr.* On decayed wood.
2. aquila, *Fr.* (no. 180). On decayed wood and sticks.
3. Desmazierii, *B. and Br.* (no. 618, with a *fig.*). On the ground.
4. Dickici, *B. and Br.* (no. 617, with a *fig.*). On living leaves of *Linnaea borealis*.
5. tristis, *Tode* (no. 181, 618\*). On dead sticks.
6. phæostroma, *Mont.* (no. 605). On dead sticks.
7. biformis, *P.* On decayed wood and on the ground.
8. Racodium, *P.* On decayed wood.

##### *b.* *Villosæ.*

9. ovina, *P.* (*Sow. t.* 219). On decayed wood.
10. eæsia, *Curr. Linn. Tr.* xxii. *p.* 316. On wood.

11. *mutabilis*, *P.* On decayed wood.
12. *Brassicæ*, *Klotzsch*; *Curr. l. c. with a fig.* On dead cabbage-stalks.
13. *scabra*, *Curr. l. c. p. 315, with a fig.* On furze.
14. *canescens*, *P.* On decayed wood.
15. *strigosa*, *A. and S.* On decayed wood.
16. *hirsuta*, *Fr.* On decayed wood.
17. *callimorpha*, *Mont. (no. 872).* On dead bramble.
18. *macrotricha*, *B. and Br. (no. 619, with a fig.).* On dead *Carex paniculata* and beech-mast.
19. *Chaetomium*, *Cl. (no. 620, with a fig.).* On dead *Carex pendula*.
20. *Eres*, *B. and Br. (no. 621, with a fig.).* On dead *Carices*.
21. *exilis*, *A. and S. (no. 606).* On pine-twigs.
22. *calva*, *Tode.* On decayed wood and branches.
23. *pilosa*, *P.* On decayed wood.
24. *hispida*, *Tode*; *Grev. t. 82.* On decayed wood.
25. *pellita*, *Fr.* On dead herbaceous stems.
26. *superficialis*, *Curr. l. c. p. 317, with a fig.* On fir-wood.
27. *capillifera*, *Curr. l. c. with a fig.* On *Corticium* and subjacent wood.

*c. Denudatæ.*

28. *Bombarda*, *Batsch.* (Plate 24, fig. 5.) On decayed wood.
29. *spermoides*, *Hoffm.*; *Grev. t. 6.* On decayed wood.
30. *papaverea*, *B. and Br. (no. 612, with a fig.).* On old stumps.
31. *moriformis*, *Tode*; *Grev. t. 39. (Bertia, D. Not.)*
32. *innumera*, *B. and Br.* On dead wood.
33. *confluens*, *Tode (no. 597).* On dead trees, etc.
34. *botryosa*, *Fr.* On old pales.
35. *stercoraria*, *Sow. t. 357. f. 1.* On sheep- and horse-dung.
36. *mammæformis*, *B.* On decayed sticks, etc.
37. *pomiformis*, *B.* On dead wood.
38. *sordaria*, *Fr.* On moist pine-wood.
39. *obducens*, *Fr. (no. 100).* On old rails.
40. *pulvis-pyrius*, *P.*; *Grev. t. 152.* On old wood, bark, etc.
41. *rhytidodes*, *B. and Br. (no. 873, with a fig.).* On ash-pollards.

42. *perexigua*, *Curr. MS.* *S. pustula*, *Curr. l. c. p.* 317. On wood.  
 43. *pulveracea*, *Ehr.* On dry wood.  
 44. *moroides*, *Curr. l. c. p.* 318, *with a fig.* On wood.  
 45. *myriocarpa*, *Fr.* On old wood.  
 46. *vesticola*, *B. and Br. (no. 874).* On old decayed linen.  
 47. *rubicola*, *Curr. l. c. with a fig.* On bramble.  
 48. *collabens*, *Curr. l. c. p.* 320, *with a fig.* On bark.  
 49. *caudata*, *Curr. l. c. with a fig.* On rotten wood.  
 50. *Curreyii*, *Blox. ; Curr. l. c. p.* 320, *with a fig.*  
 51. *pulviscula*, *Curr. l. c. with a fig.* On wood.

d. *Pertusæ.*

52. *pertusa*, *P. (no. 878, with a fig.).* On elm-boards.  
 53. *callicarpa*, *Curr. l. c. p.* 221, *with a fig.* On old palings.  
 54. *Aspegrenii*, *Fr. (no. 879, with a fig.).* On dead blackthorn.  
 55. *Jenynsii*, *B. and Br. (no. 875, with a fig.).* On dead wood.  
 56. *pæcilostoma*, *B. and Br. (no. 876, with a fig.).* On dead *Ulex*.  
 57. *brachythele*, *B. and Br. (no. 877, with a fig.).* On decorticated elder.  
 58. *vilis*, *Fr. (no. 184).* On dead wood.  
 59. *mastoidea*, *Fr. (no. 183).* On dead ash-twigs, etc.  
 60. *nucula*, *Fr.* On dead bark.

## Series 2. ERUMPENTES.

e. *Cæspitosæ.*

61. *populina*, *P. (no. 96).* On ash. See *Mag. Zool. and Bot.* iii. t. 7 a-c.  
 62. *cupularis*, *P.* On dead branches.  
 63. *acervata*, *Fr. (no. 98).* On dead branches.  
 64. *dioica*, *Moug. = S. pulvis-pyris, Auct. Curr.* On dead branches.  
 65. *Berberidis*, *P. ; Grev. t.* 84. (*Gibberidea, Fr.*) On berberry.  
 66. *Laburni*, *P. (no. 865).* On laburnum.  
 67. *nigerrima*, *Blox. (no. 869, with a fig.).* On several species of  
*Diatrype.*  
 68. *barbula*, *B. and Br. (no. 870, with a fig.).* On dead pine-bark.  
 69. *apotheciorum*, *Mass. (no. 871).* On *Parmelia subfusca*.  
 70. *nidula*, *Sow. t.* 394. *f. 2.* On bean-stalks.

f. *Obturateæ*.

71. *clongata*, Fr. On dead laburnum, etc.\*  
 72. *Spartii*. On dead broom.  
 73. *seoriadca*, Fr. (no. 176). On dead birch.  
 74. *Juglandis*, Fr. On walnut-twigs.  
 75. *Louicerae*, Sow. t. 393. f. 6. On honeysuckle.  
 76. *obliterans*, B. and Br. (no. 890, with a fig.). On bare fir-poles.  
 77. *Godini*, Desm.; Sow. t. 336 (no. 603). On dead reeds.  
 78. *culmifraga*, Fr. (no. 614). On dead grasses.

g. *Lophiostomæ*.

79. *excipuliformis*, Fr. (no. 880, with a fig.). On dead wood.  
 80. *angustilabra*, B. and Br. (no. 881, with a fig.). On dead *Ulex*.  
 81. *macrostoma*, Tode (no. 881\*). On dead holly, etc.  
 82. *fibritecta*, B. (no. 777). On bleached larch planks.  
 83. *Arundinis*, Fr. (no. 27, 639\*). On dead reeds and wheat.

h. *Ceratostomæ*.

84. *cirrhosa*, P. On soft decayed wood.  
 85. *pilifera*, Fr. On fir.  
 86. *ligneola*, B. and Br. (no. 883, with a fig.). On decayed oak.  
 87. *lampadophora*, B. and Br. (no. 882, with a fig.). On decayed wood.

## Series 3. SUBTECTÆ.

i. *Immersa*.

88. *spinosa*, P. On hard wood.  
 89. *eutypa*, Fr. On wood.  
 90. *livida*, Fr. On wood.  
 91. *melanotes*, B. and Br. (no. 623, with a fig.). On oak palings.  
 92. *hypotephra*, B. and Br. (no. 624, with a fig.). On oak palings.  
 93. *hemitapha*, B. and Br. (no. 885, with a fig.). On felled oak.  
 94. *apiculata*, Curr. l. c. p. 326, with a fig. On railings.

\* *S. fuliginosa*, Fr., is probably merely the young state of *Cenangium fuliginosum*.

95. *anserina*, *P.* (no. 888, *with a fig.*). On wood.

\*\* *Endophlææ.*

96. *velata*, *P.* (no. 19). On lime-twigs.

97. *ciliaris*, *Curr. Micr. Journ.* vii. p. 231.

98. *celata*, *Curr. MS.* (S. *obtecta*, *Curr. l. c.* p. 232).

99. *Xylostei*, *P.* = S. *semi-immersa*, *Grev. Auct. Curr.* On woodbine.

100. *decedens*, *Fr.* (no. 24). On hazel.

101. *discutiens*, *B.* On elm.

\*\*\* *Endocaulæ.*

102. *spiculosa*, *P.* On various herbaceous stems.

103. *inquilina*, *Fr.* On dead *Umbelliferæ.*

104. *Berkeleii*, *Desm.* (S. *Angelicæ*, *B.*), (no. 25, *with a fig.*). On various *Umbelliferæ.*

105. *scirpicola*, *DC.* On *Scirpus lacustris.*

106. *phomatospora*, *B. and Br.* (no. 647, *with a fig.*). On potato-stems.

j. *Obtectæ.*

\* *Rameales.*

107. *lanata*, *Fr.* (no. 185). On birch.

108. *siparia*, *B. and Br.* (no. 625, *with a fig.*). On birch.

109. *Glis*, *B. and Curr.* (no. 884). On oak.

110. *pruinosa*, *Fr.* On ash.

111. *unicaudata*, *B. and Br.* (no. 885, *with a fig.*). On *Clematis Vitalba.*

112. *vibratilis*, *Fr.* On sloe.

113. *millepunctata*, *Grev. t.* 201. On ash.

114. *salicella*, *Fr.* On willow.

115. *Argus*, *B. and Br.* (no. 626, *with a fig.*). On birch.

116. *Gigaspora*, *Desm.*; *Curr. l. c.* p. 326, *with a fig.* On maple.

117. *Corni*, *Mont.* (*Sacothecum*, *Mont.*) On cornel.

118. *aucta*, *B. and Br.* (no. 628, *with a fig.*). On alder.

119. *bufonia*, *B. and Br.* (no. 629, *with a fig.*). On oak.

120. *doehmia*, *B. and Br.* (no. 630, *with a fig.*). On elm.

121. *farcata*, *B. and Br.* (no. 631, *with a fig.*). On elm.

122. *trivialis*, *B. and Br.* (no. 632, with a fig.). On dead twigs.  
 123. *revelata*, *B. and Br.* (no. 634, with a fig.). On lilac.  
 124. *quadrinucleata*, *Curr. l. c. p.* 325, with a fig. On sticks.  
 125. *conformis*, *B. and Br.* (no. 635, with a fig.). On alder.  
 126. *Rubi*, *Curr. l. c. with a fig.* On bramble.  
 127. *fuscella*, *B. and Br.* (no. 636, with a fig.). On rose.  
 128. *sepincola*, *Fr.* (no. 636, with a fig.). On various plants.  
 129. *persistens*, *B. and Br.* (no. 637, with a fig.). On rose.  
 130. *futilis*, *B. and Br.* (no. 638, with a fig.). On rose.  
 131. *intermixta*, *B. and B.* (no. 639, with a fig.). On rose.  
 132. *oblitescens*, *B. and Br.* (no. 887, with a fig.). On *Cornus*.  
 133. *epidermidis*, *Fr.* (no. 186, 639\*). On privet, etc.  
 134. *Tamaricis*, *Grev. t.* 45. On tamarisk.  
 135. *ocellata*, *Fr.* On ash. (Placed doubtfully by Fries in *Halonina*.)  
 136. *melina*, *B. and Br.* (no. 888, with a fig.). On ash.  
 137. *Ashwelliana*, *Curr. l. c. t.* 327, with a fig. On fir.  
 138. *clypeata*, *Nees.* On bramble and *Epilobium*.  
 139. *appendiculosa*, *B. and Br.* (no. 613, with a fig.). On bramble.  
 140. *pusilla*, *Curr. MS.* *S. seriata*, *l. c. p.* 329. On wood.  
 141. *Rusci*, *Wallr.* (no. 639\*) = *S. glauco-punctata*, *Grev.* On *Ruscus aculeatus*.  
 142. *Pinastri*, *Fr. ; Grev. t.* 13. On fallen fir-leaves.

\*\* *Herbicolæ.*

143. *tomicum*, *Lév.* (no. 633, with a fig.). On *Aira cæspitosa* and *Juncus*.  
 144. *herpotricha*, *Fr.* On dead grass-stems.  
 145. *lirella*, *P.* On *Spiræa Ulmaria*.  
 146. *acus*, *Blox. ; Curr. l. c. p.* 325, with a fig. On dock.  
 147. *lineolata*, *Rob.* (no. 616). On *Amnophila arundinacea*.  
 148. *maculans*, *Sow.* (no. 641). On *Scirpus palustris*.  
 149. *pantherina*, *B.* (no. 23). On *Pteris aquilina*.  
 150. *pardalota*, *Mont.* (no. 99). On *Convallaria multiflora*.  
 151. *ccuthosporoides*, *Berk.* (no. 179). On laurel.

k. *Canlicolæ*.

152. *curvirostra*, *Sow.* On dead umbelliferæ.
153. *rostellata*, *Fr.* On shoots of bramble.
154. *coniformis*, *Fr.* (no. 190). On herbaceous stems.
155. *acuminata*, *Sow.* (no. 159). (*S. carduorum*, *Wallr.*) On thistles.
156. *cruciferarum*, *Desm.* (no. 191). On *Cruciferae*.
157. *herbarum*, *P.* = *S. Scrophulariæ*, *S. Pisi*, etc. On various  
Herbaceous plants, etc.
158. *rubella*, *P.* On dead herbaceous stems.
159. *Helenæ*, *Curr. l. c. with a fig.* On herbaceous stems.
160. *Doliolum*, *P.* On herbaceous stems.
161. *complanata*, *Tode.* On herbaceous stems.
162. *nigrella*, *Fr.* (no. 649). On *Dipsacus*.
163. *Corni-Succicæ*, *Fr.* (*Sp. Corni*, *Sow.*) "Not a true *Sphæria*,"  
*Curr. l. c. p. 330.*
164. *derasa*, *B. and Br.* (no. 639\*, *with a fig.*) = *S. calva*, *Johnst.* On  
*Senecio Jacobæa*.
165. *tritorulosa*, *B. and Br.* (no. 778, *with a fig.*). On *Epilobium*.
166. *Veetis*, *B. and Br.* (no. 779, *with a fig.*). On *Iris fetidissima*.
167. *planiuscula*, *B. and Br.* (no. 891, *with a fig.*). On herbaceous stems.
168. *Lunariæ*, *B. and Br.* (no. 892, *with a fig.*). On *Lunaria rediviva*.
169. *nigrans*, *Desm.* (no. 640). On *Dactylis glomerata*.
170. *semilibera*, *Desm.* (no. 641). On reeds.
171. *Ogilviensis*, *B. and Br.* (no. 642, *with a fig.*). On *Senecio Jacobæa*.
172. *Clivensis*, *B. and Br.* (no. 643, *with a fig.*). On parsnip.
173. *modesta*, *Desm.* (no. 644, *with a fig.*). On herbaceous stems.
174. *commanipula*, *B. and Br.* (no. 645, *with a fig.*). On *Scrophulariæ*.
175. *Thwaitesii*, *B. and Br.* (no. 646, *with a fig.*). On *Umbelliferæ*.
176. *tosta*, *B. and Br.* (no. 648, *with a fig.*). On *Epilobium*.
177. *tenebrosa*, *B. and Br.* (no. 649, *with a fig.*). On *Arctium*.

l. *Follicolæ*.\* *Rostellatæ*.

178. *fimbriata*, *B.* On living leaves of hornbeam.

179. Coryli, *Batsch ; Grev. t. 330.* On living hazel-leaves.  
 180. Avellanæ, *Schm. (no. 101).* On dead hazel-leaves.  
 181. tubæformis, *Tode ; Grev. t. 335. f. 1.* On dead alder-leaves.  
 182. Gnomon, *Tode.* On dead leaves.  
 183. setacea, *P.* On dead leaves.

\*\* *Sphærostomæ.*

184. duplex, *Sow.* On grasses, etc. Var. *Nardi* not a true *Sphæria*,  
 Curr. l. c. p. 332.  
 185. recutita, *Fr.* On grasses.  
 186. anarithma, *B. and Br. (no. 893, with a fig.).* On *Aira cæspitosa*.  
 187. sabuletorum, *B. and Br. (no. 650, with a fig.).* On *Ammophila*  
*arundinacea*.  
 188. phæosticta, *B. (no. 651, with a fig.).* On *Carex pendula*.  
 189. eucrypta, *B. and Br. (no. 652, with a fig.).* On *Carex pendula*.  
 190. helicospora, *B. and Br. (no. 653, with a fig.).* On *Cyperaceæ*.  
 191. palustris, *B. and Br. (no. 654, with a fig.).* On *Iris, Carex*, etc.  
 192. carpineæ, *Fr. (no. 655, with a fig.).* On hornbeam.  
 193. Pteridis, *Desm. (no. 656).* On dead fronds of *Pteris aquilina*.  
 194. brassicæcola, *B. and Br. (no. 656, with a fig.) = Asteroma Bras-*  
*sicæ, Chev.*  
 195. punctiformis, *Fr.* On dead leaves.  
 196. maculæformis, *P.* On dead leaves. Not a true *Sphæria*, Curr.  
 l. c. p. 332.  
 197. Eryngii, *Fr. (no. 657).* On *Eryngium*.  
 198. Rumicis, *Desm. (no. 658).* On living dock-leaves.  
 199. Leightoni, *B. and Br. (no. 659, with a fig.).* On dead leaves of  
*Linnaea borealis*.  
 200. erysiphina, *B. and Br. in Journ. Lond. Hort. Soc. ix. p. 67.* On  
 living hop-leaves.  
 201. brunneola, *Fr.* On lily-of-the-valley.  
 202. Ostruthii, *Fr. (no. 102).* On *Angelica sylvestris*.  
 203. Ligustri, *Desm. (no. 1296).* On dead privet-leaves.

## 302. CERATOSTOMA, Fr.

Perithecium soft, membranaceous. Ostiolum subulate, pencilled at the tip, or simply papillæform. Asci soon disappearing. Sporidia oozing out and forming a mass at the ostiolum.

1. caprinum, Fr. Amongst rubbish.
2. Zobelii, B. (S. Zobelii, Tul. Fung. Hyp. p. 186, with fig.). On truffles.

## 303. MASSARIA, De Not.

Perithecium subcarbonaceous. Ostiolum papillæform. Sporidia septate or simple, oozing out and staining the matrix.

1. fœdans, Fr. = S. amblyospora, B. and Br. (no. 62, with a fig.). On elm.
2. inquinans, Fr. On dead branches.
3. fimeti, Fr. On dung. (*Hypocopra*, Fr. Subgenus, spores simple.)

## 304. HERCOSPORA, Fr.

Perithecium subcarbonaceous, cup-shaped, open above, covered by the bark, and differently coloured. Papilla heterogeneous, erumpent.

1. pupula, Fr. On *Philadelphus coronarius*.

## 305. PYRENOPHORA, Fr.

Nucleus slowly formed, immersed in a sclerotoid mass which performs the office of a perithecium. Ostiolum at length slightly prominent. Sporidia multiseptate.

1. phæocomes, Fr.; Grev. t. 69. On grass.

## 306. GIBBERA, Fr.

Perithecium between waxy and horny, at length free, radiatose from the centre. Always closed.

1. *Vaccinii*, *Fr.*; *Sow. t.* 373. *f.* 1. On living branches of *Vaccinium Vitis-idea*.
2. *pulicaris*, *Fr.* On various branches, as fig, alder, etc.
3. *Saubinetii*, *Mont.* (*no.* 865). On herbaceous stems.

### 307. *DICHÆNA*, *Fr.*

Perithecia subcarbonaceous, elliptic, closed, bursting by a longitudinal fissure. Nucleus and asci diffuent, innatocrumpent.

1. *rugosa*, *Fr.* On living bark of oak and beech.
2. *strobilina*, *Fr.* On fir-cones. Not ascigerous, *Curr. l. c. p.* 329.

### 308. *CAPNODIUM*, *Mont.*

Parasitic. Mycelium creeping, black, consisting of branched, articulated, even or moniliform threads. Perithecia elongated, frequently branched, composed of confluent threads, the tips of which are often free at the apex.

1. *elongatum*, *B. and Desm.* (*no.* 900). On pear-leaves, and shoots.

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## ORDER 27. *PERISPORIACEI.*

Perithecia subglobose, always closed, except by decay, mostly membranaceous. Nucleus never diffuent.

### 309. *PERISPORIUM*, *Fr.*

Peridium subglobose, without any manifest thallus or appendages. Asci clavate. Spores indefinite.

1. *princeps*, *B.* On dead wood.
2. *Arundinis*, *Fr.* (*no.* 220), is a very doubtful production.

### 310. *LASIOBOTRYIS*, *Kze.*

Erumpent. Central peridium between fleshy and horny,

proliferous, collapsing above, attached to radiating fibres. Secondary peridia ascigerous. Asci cylindrical.

1. *Lonicerae*, *Kze.*; *Grev. t.* 191 (no. 661, with a fig.). On living leaves of honeysuckle.
2. *Linneæ*, *B.* On living leaves of *Linnea*.

### 311. SPHÆROTHECA, *Lév.*

Mycelium arachnoid. Perithecia globose, containing a single globose ascus. Appendages numerous, floccose.

1. *pannosa*, *Lév.*; *Grev. t.* 164. f. 2. On rose-leaves.
2. *Castagnei*, *Lév.* On hops. The common Hop-Mildew.

### 312. PHYLLACTINIA, *Lév.*

Parasitic. Perithecia hemispherical, at length depressed, seated on a persistent or evanescent membranacco-granular receptacle. Appendages straight, rigid, acicular, at length bent back.

1. *guttata*, *Fr.* On leaves of oak, beech, etc.

### 313. UNCINULA, *Lév.*

Mycelium floccose. Perithecia globose. Appendages rigid, simple, bifid or dichotomous, uncinata, at length bent upwards.

1. *adunca*, *Lév.*; *Grev. t.* 296. On leaves of poplar, willow, etc.
2. *bicornis*, *Lév.* On leaves of maple, sycamore, etc.

### 314. MICROSPHÆRA, *Lév.*

Mycelium arachnoid. Appendages straight, dichotomous. Branchlets swelling at the tip, or filiform.

1. *Berberidis*, *Lév.* On leaves of berberry, etc.
2. *Grossulariæ*, *Lév.* On gooseberry-leaves.
3. *penicillata*, *Lév.* On leaves of *Viburnum Opulus*.

315. **ERYSIPHE**, *Hedw.*

Mycelium arachnoid. Appendages floccose, simple or irregularly branched.

*Asci containing 2 sporidia.*

1. *Linkii*, *Lév.* On leaves of *Artemisia*.
2. *lamprocarpa*. On leaves of *Cichoraceæ*.

*Asci containing 3-8 sporidia.*

3. *graminis*. On leaves of cereals and grass.
4. *Martii*. On leaves of peas, etc.
5. *Montagnei*, *Lév.* On leaves of burdock.
6. *tortilis*, *Lk.* On leaves of cornel.
7. *communis*, *Schlecht.* On leaves of various plants.

316. **CHÆTOMIUM**, *Kze.*

Perithecium thin, brittle, mouthless. Asci linear, containing dark, lemon-shaped sporidia.

1. *elatum*, *Kze.*; *Grev. t.* 230. On damp straw.
2. *chartarum*, *Ehb.* On damp paper.
3. *glabrum*, *B.* On damp straw.

317. **ASCOTRICHA**, *B.*

Perithecium thin, free, mouthless, seated on loose, branched, conidiiferous threads. Asci linear, containing dark, elliptic sporidia.

1. *chartarum*, *B.* (*no.* 116, *with a fig.*). On damp paper.

318. **EUROTIUM**, *Lk.*

Perithecia reticulated, vesicular, coloured, attached to mucedinous threads. Asci delicate.

1. *herbariorum*, *Lk.*; *Grev. t.* 164. *f.* 1. On plants in herbaria. It is supposed that this is merely an ascigerous state of *Aspergillum*.

ORDER 28. *ONYGENEI*.

Peridium formed of closely-interwoven threads. Sporidia at length forming a compact, dusty mass.

319. *ONYGENA*, *P.*

Parasitic on animal substances. Peridium stipitate or sessile, paper-like, at length splitting. Asci delicate. Sporidia at length forming a dusty mass.

1. *equina*, *P.*; *Grev. t.* 343. On hoofs, horns, etc.
2. *piligena*, *Fr.* (*no.* 219). On decaying flannel, etc.
3. *apus*, *B. and Br.* (*no.* 582). On bones.

## FAM. VI.—PHYSOMYCETES.

Threads free, or only slightly felted, bearing vesicles which contain indefinite sporidia.

ORDER 29. *ANTENNARIEI*.

Threads black, more or less felted, moniliform and equal in the same felt, bearing here and there irregular sporangia.

320. *ANTENNARIA*, *Lk.*

Threads felted, black, articulated, often moniliform. Walls of sporangia mostly cellular. Spores chained together, immersed in gelatinous pulp.

1. *semiovata*, *B. and Br.* (*no.* 784, *with a fig.*). On *Filix-mas*.

321. *ZASMIDIUM*, *Fr.*

Sporangium thin, carbonaceous, but brittle, growing on a septate, byssoid, equal mycelium. Mouth subumbilicate. Spores simple.

1. cellare, *Fr.*; *Grev. t.* 259. In cellars.

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ORDER 30. *MUCORINI*.

Threads free, bearing terminal or lateral sporangia.

322. *ASCOPHORA*, *Tode*.

Sporangia collapsing, and at length hanging down over the fructifying apices like a hood. Fruit sometimes of two kinds.

1. *Mucedo*, *Tode*; *Grev. t.* 269. On bread.
2. *elegans*, *Cd.* On fowls' dung.

323. *MUCOR*, *Mich.*

Threads free. Sporangia at length bursting, but not dependent.

1. *Phycomyces*, *B.* *Phycomyces nitens*, *Ay.* On greasy walls, fat, etc.
2. *ramosus*, *Bull. t.* 480. *f.* 3. On decaying Fungi.
3. *Mucedo*, *L.* On fruit, etc.
4. *caninus*, *P.*; *Grev. t.* 305. On dogs' dung.
5. *fusiger*, *Lk.* On decaying Agarics.
6. *clavatus*, *Lk.* On fruit, etc.
7. *amethysteus*, *B. in Eng. Fl. l. c.* p. 332. On pears.
8. *succosus*, *B. (no. 225, with a fig.)*. On stumps of *Aucuba*.
9. *delicatulus*, *B.*; *Eng. Fl. l. c.* On rotting gourds.
10. *tenerrimus*, *B. (Hydrophora tenerrima, B.; Hook. Journ. iii. p. 78, with a fig.)* On sticks, in woods.
11. *subtilissimus*, *B. in Journ. Lond. Hort. Soc. iii. p. 98.* On mildewed onions, developed from *Sclerotium cepavorum*.

324. *HYDROPHORA*, *Tode*.

Threads erect, tubular, sparingly articulate, equal above, terminated by a vesicle which is at first watery and crystalline,

then turbid, and at length indurated and persistent from the conglomeration of the spores.

1. *stereorea*, *Tode.* On dung.

### 325. ENDODROMIA, *B.*

Vesicle very delicate, perforated by the stem, filled with delicate, branched, radiating threads, and globose spores, with a nucleus endowed with active motion.

1. *vitrea*, *B.*; *Hook. Journ. l. c. p. 79, with a fig.* On sticks, in woods.

### 326. SPORODINIA, *Lk.*

Stem dichotomously branched. Vesicles solitary, terminal, at length splitting horizontally. Columella large. Spores simple, growing on the columella.

1. *dichotoma*, *Cd.* On decaying Fungi.

### 327. ACROSTALAGMUS, *Cd.*

Flocci branched. Branches verticillate. Vesicles terminal, pierced by the threads, from the tips of which the spores are produced within the cells.

1. *cinnabarinus*, *Cd.* On decaying plants. *Verticillium lateritium* is a form of this with naked spores. *Artotrogus*, *Mont.*, is the secondary fruit of *Peronospora*.

### 328. SYZYGITES, *Ehb.*

Threads branched above. Vesicles of separate branches, conjugating, and forming a distinct sporangium.

1. *megalocarpus*, *Ehb.* On decaying *Agarics*.

### 329. ENDOGONE, *Lk.*

Hypogæous. Flocci collected into a globose, spongy mass.

Vesicles globose, solitary, or collected in little fascicles at the ends of the branches.

1. *E. pisiformis*, *Lk.*; masses globose, dry; vesicles large, visible to the naked eye. (Plate 24, fig. 7.)—*Ann. of Nat. Hist.* xviii. p. 81.

On the ground, amongst moss. Bristol.

2. *E. lactiflua*, *B. and Br. l. c.*; irregular, depresso-globose, white, then dirty flesh-coloured, fetid, filled with thick, reddish-grey milk; vesicles visible to the naked eye.

On the ground. Chudleigh, *C. E. Broome*.

## APPENDIX.

SCLEROTIUM, *Tode.*

Between cartilaginous and fleshy, with a thin, inseparable cuticle. Fruit, if any, unknown.

1. *complanatum*, *Tode*; *Sow. t.* 276. On dead leaves, etc.
2. *scutellatum*, *A. and S.*; *Grev. t.* 144. *f.* 1. On dead leaves, etc.
3. *Semen*, *Tode*; *Grev. t.* 144. *f.* 2. On decayed cabbage-stalks, etc.
4. *cepavorum*, *B.* On onions (*no.* 168).
5. *stercorarium*, *DC.* On dry cowdung.

*S. lotorum* and *Medicaginis* are merely tuberiform swellings on the roots of *Leguminosæ*.

6. *quercigenum*, *B.* On decorticated oaks.
7. *truncorum*, *Tode* (*no.* 53). On old stumps, amongst moss.
8. *fungorum*, *P.* On gills of dead Agarics.
9. *lacunosum*, *P.* Amongst leaves, etc., on the ground.
10. *muscorum*, *P.*; *Grev. t.* 101. Amongst moss.
11. *roseum*, *Kneiff* (*no.* 163). On *Juncus conglomeratus*.
12. *varium*, *P.* On decaying carrots, etc.
13. *medullare*, *B.* (*no.* 14). On Fern.
14. *neglectum*, *B.* (*no.* 91). On dead leaves.
15. *pyrinum*, *Fr.* On various fruits.
16. *Rubi*, *Curm.* On bramble-leaves.
17. *bullatum*, *DC.* On decaying gourds and cucumbers.
18. *durum*, *P.*; *Grev. t.* 1. On various herbaceous stems.
19. *Pustula*, *DC.*; *Grev. t.* 77. On oak-leaves.

RHIZOCTONIA, *DC.*

Irregular, between cartilaginous and fleshy, with a thin, inseparable cuticle, attached, root-like fibres. Fruit unknown.

1. *Crocorum*, *DC.* On roots of saffron, asparagus, potatoes, etc.

## GLOSSARY.

*Acrogenous*, attached to the tips of the threads or their branchlets.

*Adnate*, firmly attached to the stem.

*Adnexed*, just reaching the stem.

*Agglutinate*, firmly glued to the matrix.

*Amphigenous*, when the hymenium is not confined to a particular surface.

*Anastomosing*, spoken of threads which become confluent with each other, and form an irregular network.

*Apices*, tips of threads or their divisions.

*Appendiculate*, attached in fragments to the border of the pileus; sometimes applied to spores or sporidia which have terminal appendages.

*Approximate*, approaching the stem, but not quite reaching it.

*Arachnoid*, delicate, like a spider's web.

*Areolate*, divided into little areæ.

*Aristate*, bearded; applied to spores and sporidia.

*Ascus*, a delicate sac containing sporidia.

*Astomous*, without any aperture.

*Attenuated*, spoken of gills which are

gradually narrower at either extremity.

*Auriform*, shaped like an ear.

*Byssisedæ*, seated on fine, matted threads.

*Byssoid*, resembling fine, matted threads, which are often collected in little bundles.

*Cæspitose*, growing in tufts.

*Capillitium* applies to the threads of Puff-balls.

*Carbonized*, impregnated with dark matter, so as to appear more or less charred.

*Caulicolæ*, growing on herbaceous stems.

*Ceratostomæ*, spoken of perithecia in which the neck is much elongated.

*Circinate*, disposed in a circle.

*Circumscriptæ*, surrounded by a thin, black crust, and, consequently, when the stroma is broken off, a black ring is left on the matrix.

*Concatenate*, chained together.

*Conchiform*, shell-shaped.

*Conglutinate*, glued together, as when the spores are collected in little heaps which do not easily break up.

*Conidia*, dust-like secondary spores.

*Connate*, as when two or more pilei become united.

*Continuous*, as when one organ runs into another without any decided interruption. This is, I believe, synonymous with *contiguus* of Fries.

*Crenulate*, notched or scalloped.

*Cyst*, a subglobose cell or cavity.

*Decurrent*, when the gills are very acute behind, and run down the stem.

*Denudatæ*, naked, exposed, not immersed.

*Determinate*, when a Fungus has a distinctly-defined outline.

*Dichotomous*, regularly forked.

*Dimidiate*, semiorbicular; when relating to the gills, it intimates that they reach only halfway from the border of the pileus to the stem.

*Distant*, far apart from each other, whereas *remote* means that they do not reach the stem.

*Echinate*, beset with short, rigid bristles.

*Echinulate*, the same as the last, only with shorter and more delicate bristles.

*Effusæ*, spread out over the matrix.

*Effused*, spread out over the matrix.

*Emarginate*, when the gills are suddenly scooped out before they reach the stem.

*Emergent*, springing from beneath the surface of wood, bark, or cuticle.

*Endocaulæ*, growing in the substance of herbaceous stems.

*Endochrome*, the contents of cells where no sporidia are produced before their production.

*Endophlææ*, growing in bark.

*Excipulum*, a little saucer or receptacle.

*Farinose*, mealy.

*Fasciculate*, growing in little bundles.

*Fibrillose*, clothed with little, loose fibres.

*Fistulose*, hollow, like a pipe.

*Flocci*, threads, as those of a Mould.

*Furfuraceous*, branny.

*Fusiform*, spindle-shaped.

*Grumous*, clotted, as the contents of some cells.

*Guttate*, marked with tear-like spots.

*Gyrose*, folded and waved, or marked with wavy lines.

*Herbicolæ*, growing on herbaceous plants.

*Heterogeneous*, when adjacent parts are different in structure.

*Homogeneous*, when they are similar in structure.

*Hyaline*, transparent.

*Hygrophanous*, having a watery aspect when moist, but more or less opaque when dry.

*Hymenium*, the fructifying surface.

*Hymenophorum*, the structure which bears and gives rise to the *hymenium*.

*Hypogæous*, subterraneous.

*Hypothecium*, the part beneath the nucleus in *Sphæriacei*, etc., especially when it is compact.

*Immersæ*, sunk into the matrix.

*Imperforate*, without any terminal aperture.

*Incusæ*, sunk as jewels in a die.

*Indehiscent*, not splitting, except by decay.

*Infundibuliform*, funnel-shaped.

*Inserted* (insititius); growing immediately from the matrix, like a graft from its stock.

- Labiate*, aperture with distinct, lip-like borders.
- Laccate*, varnished, or covered with a coat like sealing-wax.
- Lacunose*, having little cavities, or pitted.
- Linguaform*, tongue-shaped.
- Lophiostomæ*, aperture crested.
- Marginate*, having a distinct, definite border.
- Matrix*, anything on which a Fungus grows.
- Moniliform*, necklace-like.
- Mucedinous*, like a Mould.
- Mycelioid*, like a mycelium.
- Mycelium*, spawn, which may be either filamentous or vesicular.
- Neck*, spoken of perithecia which resemble an india-rubber bottle with a distinct neck.
- Nucleus*, the hymenium of *perithecia*, which is generally more or less gelatinous.
- Obiectæ*, covered by the cuticle.
- Obturatæ*, literally bunged up, applied to certain *Sphariæ*.
- Obvallatæ*, literally walled up, applied to certain *Sphariæ*.
- Ostiolum*, mouth of perithecium, like the mouth of a bottle.
- Pallid*, pale, but undecided in colour.
- Papillate*, covered with little pap-like elevations, or ending in a papilla.
- Papyraceous*, thin, like paper.
- Patellæform*, saucer-shaped.
- Pendulous*, hanging down like the flower of a foxglove.
- Peridium*, general covering, as in a Puff-ball.
- Peridiola*, used when a number of smaller peridia are contained within the general envelope.
- Peronate*, used when the stem has a distinct, stocking-like coat.
- Perithecia*, the bottle-like, fruit-bearing bodies in *Sphariacei*, which may be naked, sunk in a stroma, or covered by a portion of the matrix.
- Pertusa*, pierced at the apex of the perithecium by the separation of the ostiolum.
- Pileoli*, secondary pilci.
- Pileus*, the hat-shaped receptacle in Mushrooms, etc.
- Pruinose*, frosted, or covered with bloom like a plum.
- Pulvinatæ*, cushion-shaped.
- Rameales*, growing on twigs.
- Remote*, spoken of gills which are free, and leave a considerable space between them and the stem.
- Reniform*, kidney-shaped.
- Resupinate*, spread over the matrix, and having the hymenium upwards, and not beneath, as in the Mushroom.
- Rhizomorphoid*, like roots.
- Rimose*, cracked.
- Ring*, part of the veil adhering to the stem, and forming a ring or collar.
- Rivulose*, marked with lines like the rivers in a map.
- Rostellatæ*, having a little, elongated neck, extending beyond the surface of the matrix.
- Rostrate*, having a long, free neck.
- Scrobiculate*, marked with little pits.
- Scutellæform*, shield-like.
- Septate*, having partitions.
- Sinuated*, when the gills are suddenly waved just before they reach the stem.
- Spathulate*, shaped like a spatula.

- Sphaerostoma*, having a globular ostium.
- Spicules*, the points to which the spores are attached, sometimes called *sterigmata*.
- Sporangia*, large vesicular bodies containing sporidia or distinct organisms, producing spores in the centre.
- Spores*, reproductive cells, borne freely on the sporophores.
- Sporidia*, reproductive cells produced within asei or sporangia, from a transformation of their endochrome.
- Sporophores*, cells which are surmounted by fertile spicules, sometimes called *basidia*.
- Squarrose*, rough with projecting or deflexed scales.
- Strigose*, rough with fascicles of hairs.
- Stroma*, the substance in which the perithecia are immersed in the compound *Sphaeriaceæ*.
- Stuffed*, spoken of the stem when filled with a cottony web, or a spongy mass distinct from the walls.
- Sub*, used in composition to denote a slight degree of anything.
- Subiculum*, the filamentous mycelium of some *Sphæriæ*.
- Subtectæ*, more or less covered.
- Subulate*, awl-shaped.
- Sulcate*, furrowed.
- Tan-coloured*, the colour of wash-leather.
- Tomiparous*, producing spores by division.
- Trama*, the substance intermediate between the hymenium in the gills of *Agarics* or pores of *Polyporus*.
- Tremelloid*, shaking like jelly.
- Umbilicate*, with a somewhat definite central depression.
- Umbonate*, with a central boss.
- Uncinate*, hooked, or hook-shaped.
- Ungulate*, hoof-shaped.
- Veil*, a partial covering of the stem or margin of the pileus.
- Ventricose*, swelling out in the middle.
- Vermiculate*, worm-shaped.
- Verruceform*, wart-shaped.
- Versatiles*, various in form and nature.
- Versiform*, various in form.
- Vesicular*, having a bladder-like sporangium, or composed of cells.
- Verticillate*, whorled.
- Villosæ*, covered with down.
- Virgate*, streaked, or with wand-like branches.
- Volva*, a general wrapper, sometimes membranous, sometimes gelatinous.

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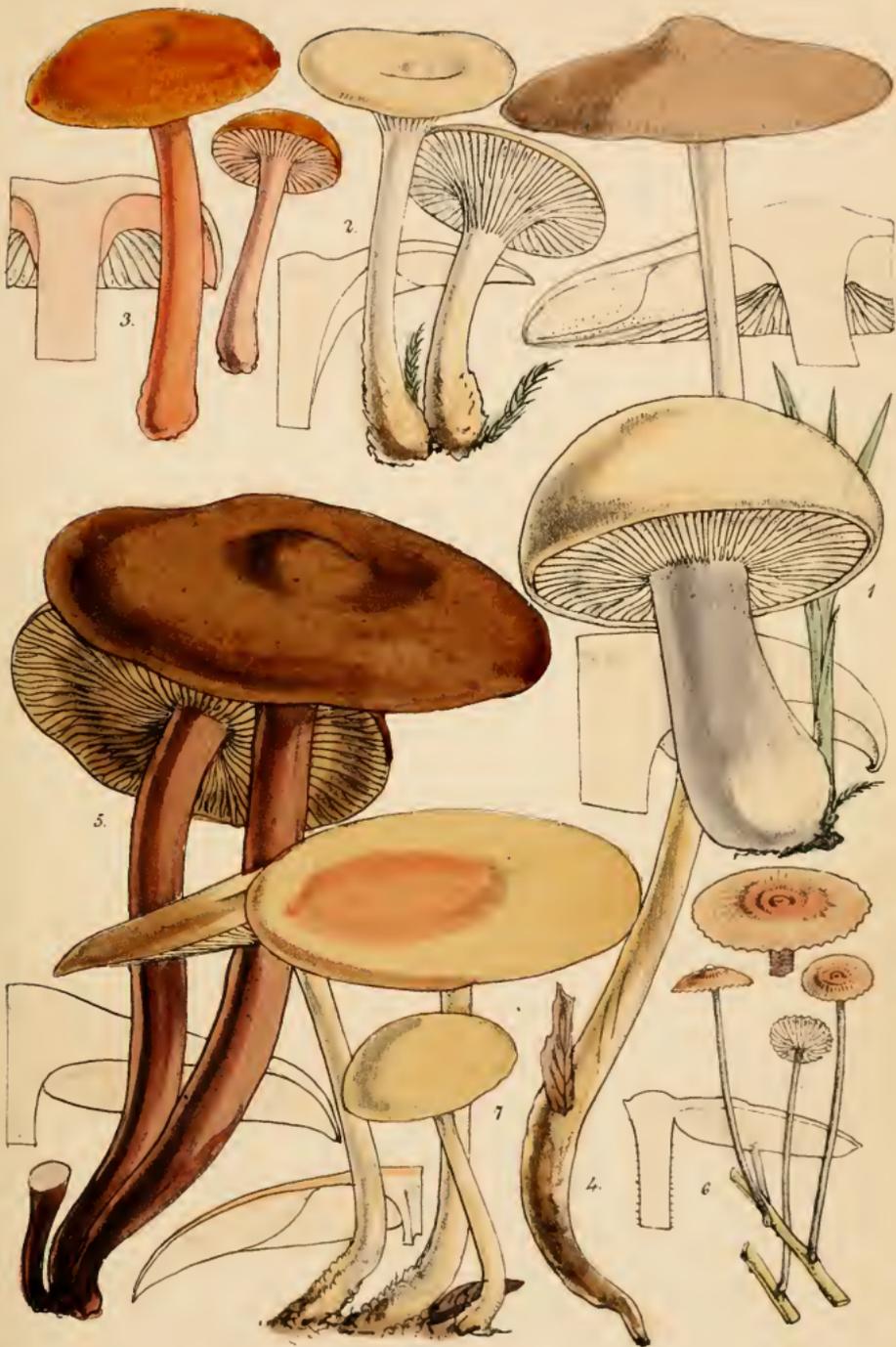








































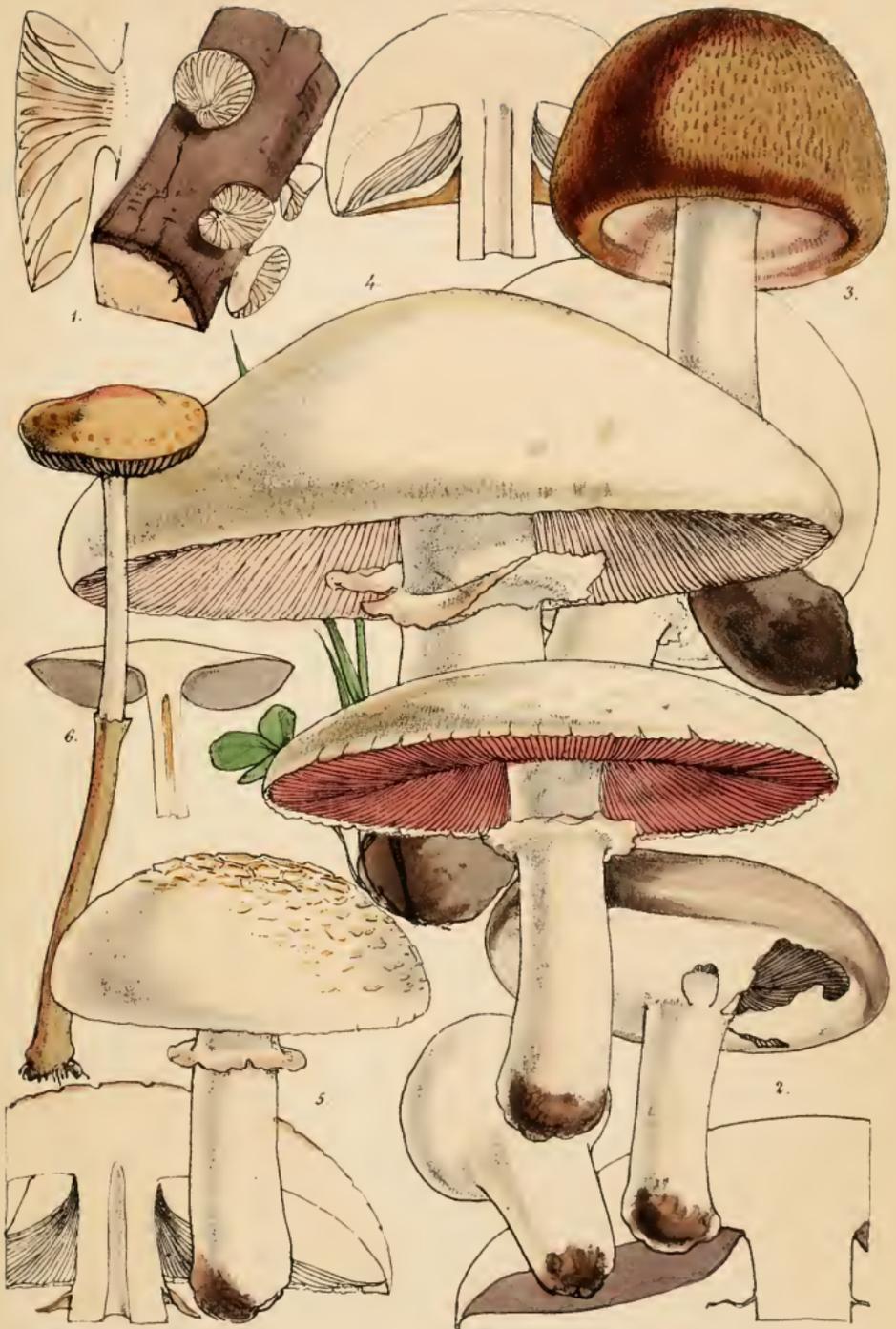


























































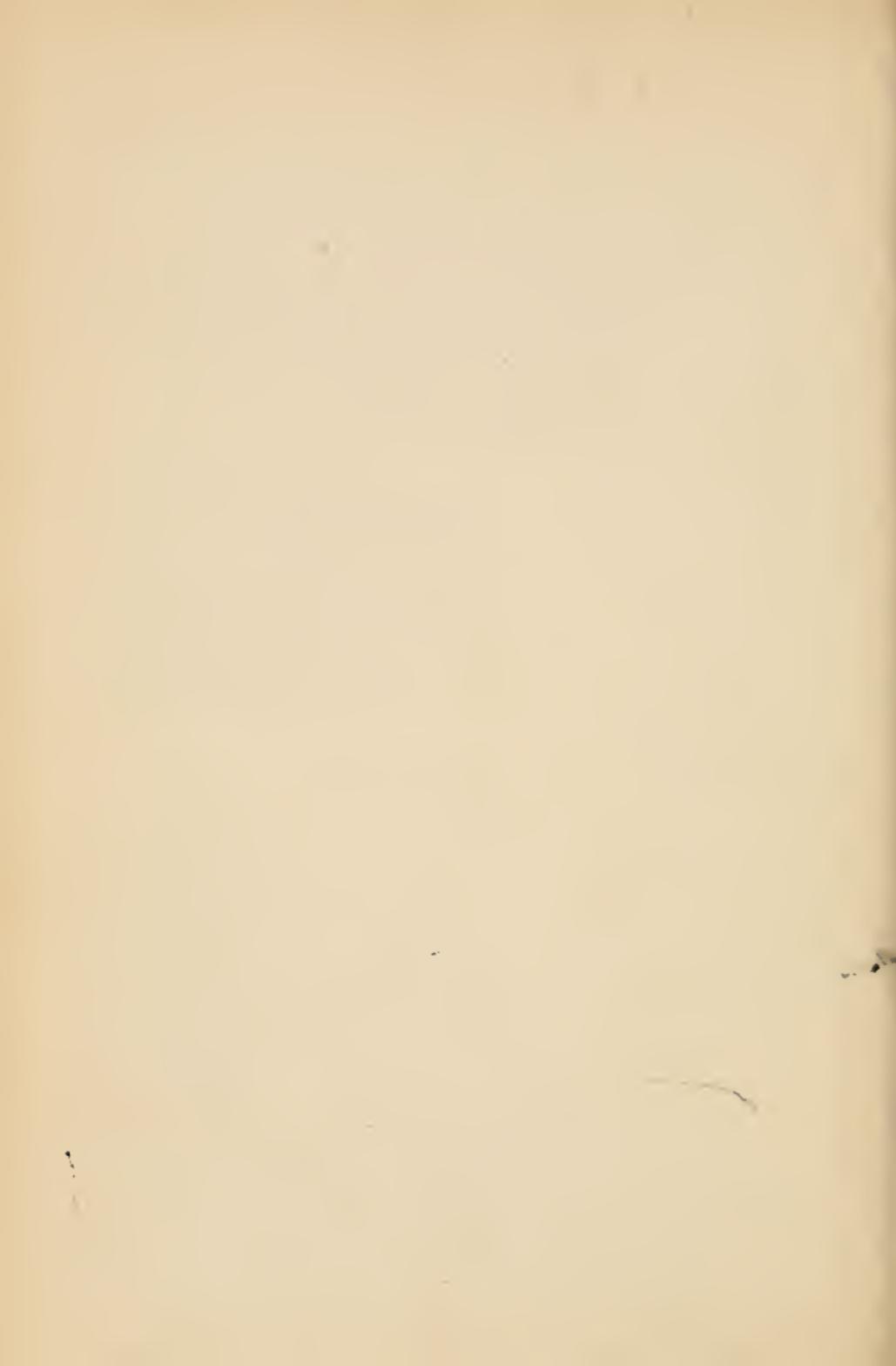


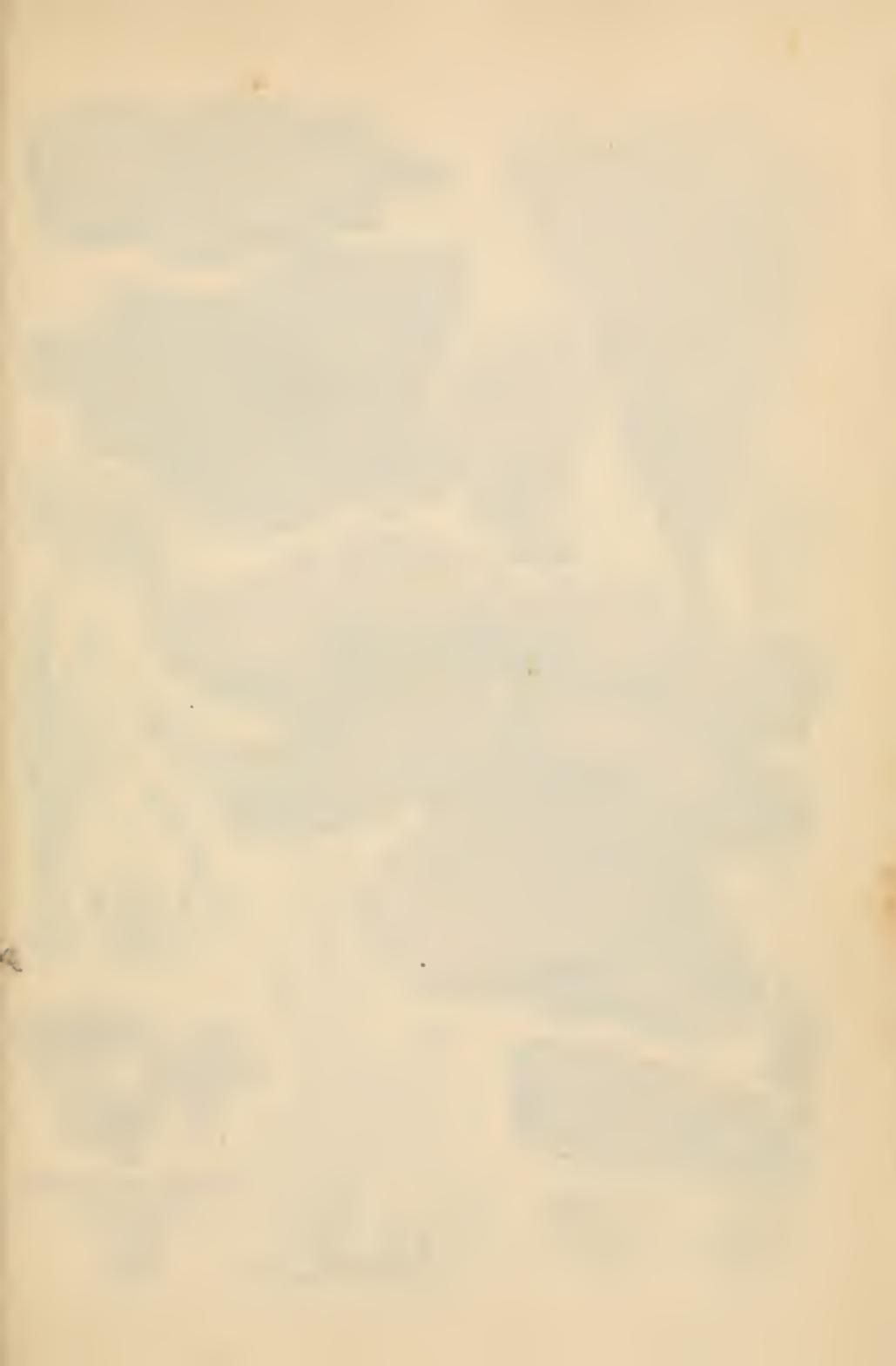




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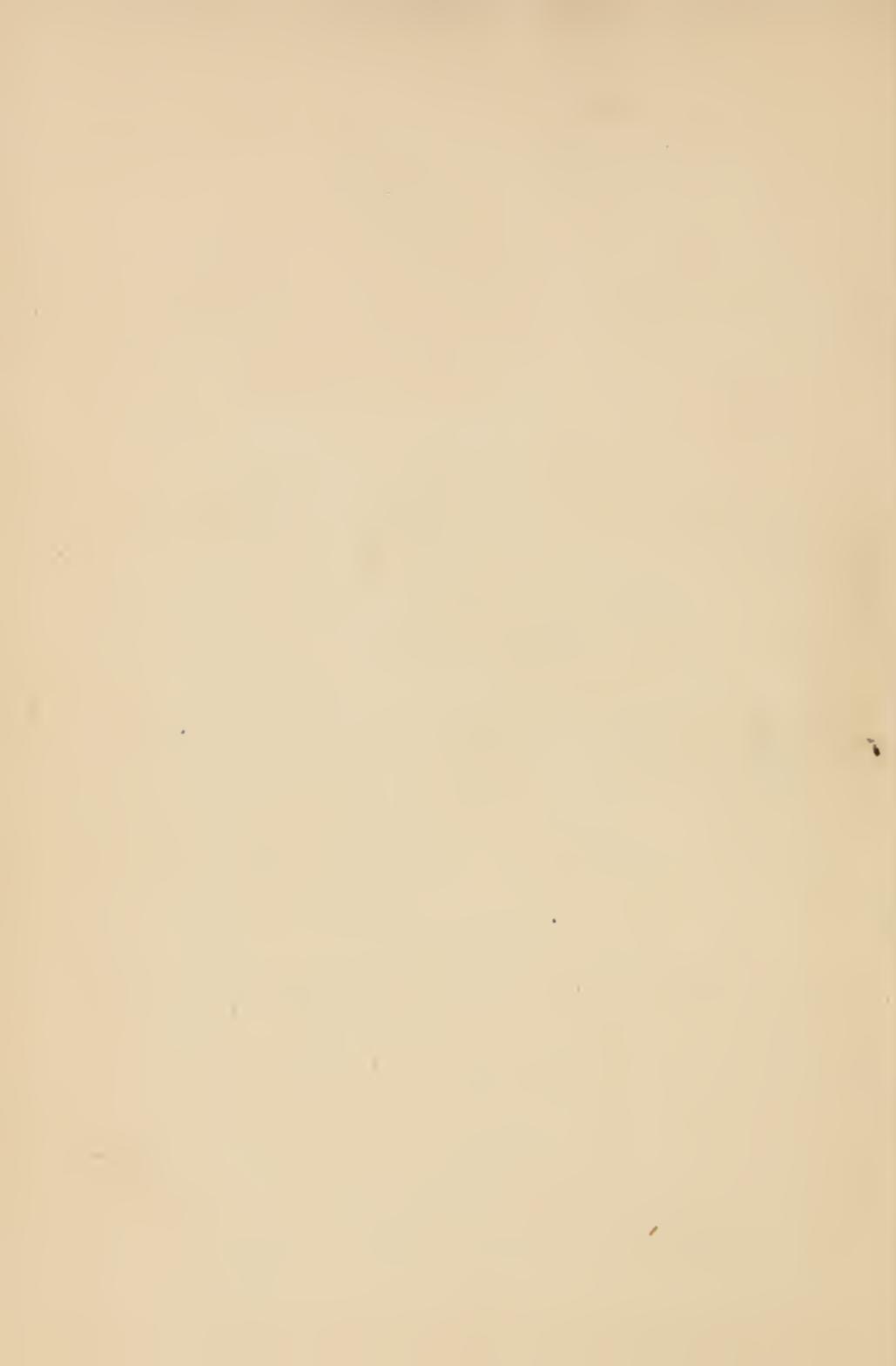
























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