

**NOTES ON 'CYPHELLACEAE'.—I**

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The author regards the Cyphellaceae as an artificial family. He redefines it for practical purposes, suggesting the gradual removal of those elements that show relationship with other groups; several elements are referable to the Corticiaceae or the agarics. A list of the 'cyphellaceous' generic names tentatively included is given. The genera to be excluded from the family as defined are briefly discussed. The same applies to a long series of specific names that had or have been included. A historic chapter reviews some important developments in regard with some of the older genera, *Solenia*, *Cyphella*, *Aleurodiscus*, as well as the rise of the family. Some species are transferred to *Aleurodiscus* Rab. ex J. Schroet.; *Cytidia* Quél. is redefined and *Auriculariopsis* Maire excluded from it. Other genera reviewed and redefined are *Stromatoscypha* Donk [*Porotheleum* (Fr. per Fr.) Fr.], *Chromocyphella* De Toni & Levi [*Phaeocyphella* Pat.], and *Lachnella* Fr. Two new monotypic genera are introduced, *Cellypha* Donk and *Pellidiscus* Donk. One or more species of the redefined and new genera are discussed. The name *Mycena* sect. *Hirsutae* (Kühner) ex Donk is validly published. Several specific names are reduced to the synonymy of other species for the first time. Several types of names published by Persoon and by von Albertini & von Schweinitz were studied. New combinations are made under *Hymenochaete* Lév. (1), *Favolaschia* (Pat.) Pat. (1), *Aleurodiscus* (2), *Cellypha* (1), *Pellidiscus* (1), *Chromocyphella* (1).

INTRODUCTION.—A recent development in connection with the study of the 'Cyphellaceae' is a paper published by W. B. Cooke (1957) entitled, "The Porotheleaceae: *Porotheleum*". It will be followed by a second dealing with "*Solenia*, *Phaeosolenia*, *Leptotus* and *Chromocyphella*". Cooke seems to consider all these genera sufficiently related to be combined into a natural family. I confess from the start that I do not at all concur with this view and that I consider most of these genera not only completely unrelated but also highly artificial. A point in case is Cooke's emendation of *Porotheleum* (Fr. per Fr.) Fr. (= *Stromatoscypha* Donk). He combines into this genus, for instance, both *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk and *Solenia poriaeformis* (Pers. per Mérat) Fuck. The two have so little in common that, in my opinion, they should go into different families. On the other hand, Cooke does not include in *Porotheleum* the nearest relatives of *Solenia poriaeformis*, like *Cyphella cupulaeformis* Berk. & Rav. apud Berk. and other species, which, I think, must be placed with it in one genus.

In the present series of notes I hope to develop gradually the thesis that the 'Cyphellaceae' are a heterogeneous assemblage of more or less 'reduced' taxa

pertaining to different families from various quarters of the Hymenomycetes: Corticiaceae, several families of Agaricales, Schizophyllaceae (which should probably not be included in the Agaricales at all), and perhaps still others.

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#### I.—DEFINITION AND CONTENTS OF THE CYPHELLACEAE

W. B. Cooke (1957: 681) stated that "the use of the name Cyphellaceae has never been completely validated. Pilát uses it in several publications." Therefore, he felt obliged to replace the name Cyphellaceae by the name Porotheleaceae Murrill ("Porotheliaceae"). However, the situation is not as bad as that: those authors who believe that there exists a natural group of genera, like the one Cooke calls Porotheleaceae, may drop this name again and return to the more familiar one of Cyphellaceae, which was validly published more than once prior to Murrill's name. It may be pointed out that Pilát never claimed to have introduced it himself, but if there had been no previous validation, his repeated publication of the name could constitute validation many times over, since in several cases it was accompanied by a description or a reference to one.

#### CYPHELLACEAE Lotsy

Matulales Mass. in J. R. micr. Soc. II 8: 176. 1888 ("Matuleae"; nomen anamorphosis). — Type: *Matula* Mass.

Cyphellei J. Schroet. in Krypt.-Fl. Schles. 3 (1): 433. 1888 (as a "Gruppe" below the rank of a family). — Cyphelleae Killerm. in Nat. PflFam., 2. Aufl., 6: 149. 1928 (tribus). — Type: *Cyphella* Fr.

[Sous-tribus Cyphellés: Pat., Essai taxon. Hym. 51, 52. 1900.]

[Famille des Cyphellacées: Maire in Bull. Soc. mycol. France 18 (Suppl.): 99. 1902. —] Cyphellaceae Lotsy, Vortr. bot. Stammesgesch. 1: 695, 696. 1907; Herter in KryptFl. Mark Brandenb. 6: 132. 1910.

[Tribu des Cyphellées: Maire in Bull. Soc. mycol. France 18 (Suppl.): 101. 1902. —] Cyphelleae Lotsy, Vortr. bot. Stammesgesch. 1: 696, 698. 1907. — Type: *Cyphella* Fr.

Porotheleaceae Murrill in Mycologia 8: 56. 1916 ("Porotheliaceae"). — Type: *Porotheleum* Fr.

Aleurodiscinae Pilát in Ann. mycol., Berl. 24: 206. 1926 (subtribus?). — Aleurodisceae (Pilát) Killerm. in Nat. PflFam., 2. Aufl., 6: 142. 1928 (tribus; "Aleurodiscineae").<sup>1</sup> — Type: *Aleurodiscus* Rab. ex J. Schroet.

Cyphelloideae Donk in Meded. Nederl. mycol. Ver. 18-20: 127. 1931; G. Cunn. in Trans. roy. Soc. New Zeal. 81: 173. 1953 (without Latin description). — Type: *Cyphella* Fr.

Leptotaceae Maire in Treb. Mus. Ciènc. nat. Barcelona 15 (Sèr. bot. 2): 52. 1933 & in

<sup>1</sup> Pilát introduced this taxon as a "Gruppe" below the rank of a family using the termination of a subtribus for the name. Killermann also calls it Aleurodiscineae, but gave it the rank of a tribus; he thus used an incorrect termination.

Publ. Inst. bot., Barcelona 3 (4): 58. 1937 (nomen nudum); Sing. in *Lloydia* 8: 188. 1945 (without Latin description). — Type: *Leptotus* P. Karst.

Cyphellineae Bond. & Sing. in *Ann. mycol.*, Berl. 39: 44, 45. 1941 (subordo; nomen nudum). — Type: *Cyphella* Fr.

DEFINITION.—Homobasidious hymenomycetes. Fruit-body cup- to disk-shaped or tubular, dorsally attached by a constricted base, sessile to stalked, small (at most up to one or a few mm, rarely exceeding 1 cm in diameter); numerous fruit-bodies may be crowded on a resupinate 'stroma'. Hymenium lining the concave (or at most flat) 'disk', smooth and even (rarely more or less wrinkled to folded), not compounded by partitions sterile on edge.

TYPE.—*Cyphella* Fr.

One will easily call to mind several instances of species answering to this definition, but yet not included to-day even by supporters of the 'family': compare *Mycobonia disciformis* G. Cunn., *Plicatura* Peck; *Corticium evolvens* (Fr. per Fr.) Fr., as originally conceived; *Stereum* Pers. per Fr. *sensu stricto*, which consists essentially of species with dorsally attached fruit-bodies; individual fruit-bodies of *Merulius tremellosus* Schrad. per Fr. like those that have been placed in a distinct genus (*Trabecularia* Bon.).

In the above definition of the 'family' I have stipulated that the hymenium is not compounded by partitions sterile on edge, to exclude such genera as *Favolaschia* (Pat.) Pat. apud Pat. & Lagerh., *Resupinatus* (C. Nees) per S. F. Gray. The first of these genera possesses a hymenophore that may be said to consist of tubes as in the polypores, although in some species these are usually few, the others are more or less typically lamellate and are better regarded as agarics. *Schizophyllum* Fr. per Fr., with its peculiar 'gills' is also to be excluded.

The definition further excludes genera with convex hymenium (*Pistillina* Quél., *Wiesnerina* Höhn.) or with fertile warts (*Punctularia* Pat. apud Pat. & Lagerh.); with fruit-bodies laterally stalked (*Leptoglossum* P. Karst., *Stereophyllum* P. Karst.); and with tubes ('fruit-bodies') on a laterally stalked fruit-body ('stroma') (*Fistulina* Bull. per Fr.).

Moreover, such genera as have drifted into the 'family' by obvious misconceptions or some far-fetched interpretation of characters should not be admitted either: *Hypolyssus* Pers. *sensu* Berk. (= *Caripia* O.K.), *Dacryobolus* Fr., *Trogia* Fr., *Chlorocyphella* Speg. A more detailed review of the excluded genera will be found below.

CONTENTS.—For an annotated enumeration of the generic names proposed for the 'Cyphellaceae', see Donk (1951). "Additions and corrections" to the cited paper will be published shortly after the Congress at Montreal.

I would now add to the list of cyphellaceous genera *Arrhenia* Fr. (type species, *Cantharellus auriscalpium* Fr.; cf. Donk, 1957a: 19). Until a few years ago the type species was so little understood that it was not at all certain that it was correctly identified when redescribed, for instance, by Patouillard (1900: 130 f. 63). Recent descriptions and illustrations published by Pilát (1951: fig. on p. 444; apud Pilát & Nannf., 1955: 33 f. 14) and Favre (1955: 36 f. 13, pl. 4 f. 3) demonstrate that the

young fruit-body is erect, stalked and infundibuliform, and that the cup gradually develops asymmetrically, exposing the disc laterally and even downwards. Such a fruit-body is reminiscent of one of *Geotus* Pilát & Svrček (1953: 9) but in that genus the cap is strictly laterally attached to the stalk. It has also become necessary to compare *Arrhenia* with *Rimbachia* Pat. for from Singer's description (1945: 186) of *Rimbachia paradoxa* Pat. (the type species of Patouillard's genus) no striking differences are evident. Moreover, the position of *Arrhenia pezizoidea* (Speg.) Sing. (l.c.) should come under renewed consideration. Attention is also drawn to a few species described from Europe which ought to be considered in connection with *Arrhenia*, like *Cyphella cochlearis* Bres.

The following list of generic names is based on species supposed here to fall within the limits of the present 'family' (see Table I).

REGIONAL CONTRIBUTIONS.—As a rule the 'Cyphellaceae' have not been favoured by mycologists. Those who paid attention to them generally did so fleetingly by describing new species that are often unrecognizable from their too short descriptions (Berkeley, Cooke, Hennings). Such careless work has led to a vast number of species among which nobody can find his way without access to the types.

As in several other genera of minute hymenomycetes, Patouillard (1883-9) has done important work in this case for France. This country has also been lucky in having a valuable account of many of its species by Bourdot & Galzin (1928). Pilát (1924-1925a-c) studied the group for Czecho-Slovakia, describing several new species and including a chapter on ecological and phytogeographical aspects (Pilát, 1925b: 31-35). Scattered but noteworthy contributions were published by Petch for Ceylon, while Burt (1914, 1924, 1926) has done much to give a more up-to-date account of the North American species. Recently W. B. Cooke published on the genera *Cytidia* (1951) and *Porothelium* (1957).

Like so many other groups of fungi, the cyphellas are in urgent need of careful work by local collectors and by monographers.

## 2.—SOME HISTORICAL REMARKS

*Solenia* and *Cyphella*.—The fathers of mycology, who made only incidental use of the compound microscope, were fully aware that most cup-fungi had asci, but hardly that a few species had different bodies of spore-production. Neither Persoon, nor Fries in his earlier work, understood much about these organs. The basidia especially, which Micheli had seen long before, appeared to be a problem to them. In those times it could hardly be expected that the cup-fungi with asci and those with basidia would be separated from each other on the basis of such a fundamental difference. It is, therefore, surprising to note that when the taxonomic importance of these organs became fully appreciated by later authors the segregation of the two kinds of cup-fungi had already taken place. *Peziza* had been restricted by the exclusion of the genera *Solenia*, *Cyphella*, and *Porothelium*, and of some species that had been transferred to *Thelephora* and later to *Corticium* (the heterogeneous

TABLE I  
LIST OF GENERIC NAMES OF CYPHELLACEAE

- Aleurocystis* Lloyd ex G. Cunn.—*Cytidia hakgallae* (Berk. & Br.) G. W. Mart.  
<sup>1</sup>*Aleurodiscus* Rab. ex J. Schroet.—*Thelephora amorpha* (Pers. per Purt.) Fr.  
*Arrhenia* Fr.—*Cantharellus auriscalpium* Fr.  
*Auriculariopsis* Maire.—*Cyphella ampla* Lév.  
*Calyptrella* Quél.—*Cyphella capula* (Holmskj. per Pers.) Fr.  
*Catilla* Pat.—*Cyphella pandani* Pat.  
*Chromocyphella* De Toni & Levi ≡ *Cymbella* Pat.  
†*Cymbella* Pat. apud Doass. & Pat.—*Cymbella crouani* Pat. & Doass. apud Pat.  
\**Cypharium* Clem. ≡ *Cyphella* Fr.  
<sup>1</sup>*Cyphella* Fr.—*Cyphella digitalis* (A. & S. per Pers.) Fr.  
*Cyphellopsis* Donk.—*Solenia anomala* (Pers. per Fr.) Fuck.  
*Cytidia* Quél.—*Cytidia rutilans* (Pers.) ex Quél.  
*Cyidiella* Pouz.—*Cyidiella melzeri* Pouz.  
*Dendrocyphella* Petch.—*Dendrocyphella setosa* Petch.  
*Flagelloscypha* Sing.—*Cyphella minutissima* Burt  
*Gloeosoma* Bres.—*Aleurodiscus vitellinus* (Lév.) Pat.  
<sup>2</sup>*Henningsomyces* O.K. ≡ *Solenia* Pers.  
*Lachnella* Fr.—*Peziza alboviolascens* (A. & S. per Pers.) Schw.  
\**Lachnium* Clem. ≡ *Lachnella* Fr.  
<sup>3</sup>*Leptotus* P. Karst.—*Cantharellus retirugus* (Bull.) per Fr.  
†*Lomatia* (Fr.) P. Karst.—*Corticium salicinum* (Fr.) Fr.  
§*Lomatina* P. Karst. ≡ *Lomatia* (Fr.) P. Karst.  
*Merismodes* Earle.—*Cantharellus fasciculatus* Schw.  
§*Nodularia* Peck.—*Nodularia balsamicola* Peck.  
†*Phaeocarpus* Pat. ≡ *Cymbella* Pat.  
<sup>4</sup>*Phaeocyphella* Pat. ≡ *Cymbella* Pat.  
†*Phaeocyphella* Speg.—*Phaeocyphella sphaerospora* Speg.  
*Phaeosolenia* Speg.—*Phaeosolenia platensis* Speg.  
†*Porothelium* (Fr. per Fr.) Fr.—*Polyporus fimbriatus* (Pers.) per Fr.  
*Pseudodasyscypha* Velen.—*Cyphella hyperici* Velen.  
*Rimbachia* Pat.—*Rimbachia paradoxa* Pat.  
†*Solenia* Pers. per Fr.—*Solenia candida* Pers.  
*Stigmatolemma* Kalchbr.—*Stigmatolemma incanus* Kalchbr.  
*Stromatoscypha* Donk ≡ *Porothelium* (Fr. per Fr.) Fr.

\* Names not validly published.

† Names not available for various reasons (illegitimate).

§ Names based on species identifiable with type species of legitimate generic names published earlier.

<sup>1</sup> *Aleurodiscus* is conserved against *Cyphella*.

<sup>2</sup> Valid publication of name still uncertain.

<sup>3</sup> Often fused with *Leptoglossum* P. Karst., which is then the correct name.

<sup>4</sup> A later synonym of *Chromocyphella* De Toni & Levi.

group currently called *Cytidia*). Of course there were, and still are, a few retouches to be made.

Persoon (1794: 106) started this process of differentiation by setting aside *Solenia*, with one species, *S. candida* Pers. The leading character was the shape of the fruit-body: "Utriculo sessili membranaceo, cylindrico, ad basin cavo." Shortly afterwards with reference to *Peziza anomala* Pers. he remarked:—

"Incertum est . . . jure sub hoc militet genere [*Peziza*], etiam *hactenus* sub microscopico nullas thecas invenire mihi licuit; eam lubentius *Soleniis* adscripserim, si substantia membranacea & rigida esset: neque etiam ob discum hemisphaericum in apice aliis *Pezizis* similem usque ad basin excavata est."—Persoon (1796: 29). For translation, see page 32.

The next year he asked tentatively (Persoon, 1797: 73) if it would not also be correct to refer to *Solenia* such species as *Peziza urceolata* Vahl and *P. cuticularis* Dicks., both of which he knew only from their published accounts, and both now confidently suspected to be 'Cyphellaceae'. Still later Persoon (1822: 281) remarked about *Peziza capula* Holmskj. (which he seems not to have known from specimens under that name), "Ni fallor, potius ad familiam Thelephoream spectat et forsitan species [*Thelephorae*] subgeneris *Epibryi*."

Fries (1822: 200) accepted *Solenia* and included not only such species as *Solenia ochracea* Hoffm. (added to the genus as early as 1795), *Peziza candida* and *P. fasciculata* Pers. (two other species entered previously), but also *P. anomala*. Of the genus he stated: "Asci nulli. Sporidia elastice secedunt? vix discernibilia."

Simultaneously with the acceptance of *Solenia*, Fries (1822: 201) introduced *Cyphella* Fr. for non-tubular species, "Asci nulli. Sporidia globosa, majuscula, pulveris instar secedentia." (The spore-features were evidently taken from *Peziza digitalis* A. & S.<sup>2</sup>) Thus it is clear that Fries, like Persoon for *Peziza anomala*, accepted the fact that the two genera had no asci, but he did not mention basidia.<sup>3</sup> (Compare also Fries, 1822: 39, 206).

Fries (1821: lv) at first associated *Cyphella* and *Solenia* with *Peziza*, stating however that they differed in the lack of asci, a discrepancy he waved aside with this remark: "Non tamen separo. Eodem modo inter plantas Vasculares, quarum singula series e *plantis aquaticis* a scendit, infimae vasis substitutatae."

Basidia were detected and (rather crudely) depicted by L veill  (1837: *pl. 8 f. 10*) when he studied *Cyphella taxi* L v. along with several other hymenomycetes. From that time on *Cyphella* had basidia as far as L veill  was concerned and when he described *Cyphella gibbosa* L v. [= *Calyprella capula* (Holmsk. per Pers.) Qu l.] and *Cyphella ampla* L v. [= *Auriculariopsis ampla* (L v.) Maire] he placed them in

<sup>2</sup> What may be considered the type specimen (ultimate type) of the generic name *Cyphella* is still conserved in Fries's herbarium at Upsala. It is labelled "*Peziza digitalis* Alb. & Schw." (written by G. Kunze), "*Cyphella Digitalis* Fr. (Dedit. Kunze)" (written by Fries).

<sup>3</sup> One of the original species of *Cyphella* is *Peziza eruciformis* Batsch, which Fries knew only from the original account by Micheli. If correctly interpreted today, this would be the first species of the 'Cyphellaceae' ever to be described.

*Cyphella* because they belonged to the "Champignons basidiosporés" as opposed to the "thecasporés"; for both species he recorded the "basides tétraspores" from the inside of the cup. It is interesting to note that Montagne (1836: 286–287) at about the same time that Lévillé clearly saw basidia, could not free himself from tradition and recorded the basidia of his interpretation of *Peziza campanula* C. Nees per Fr. (= *Calyprella capula*) as follows: "Les thèques sont très courtes, en massue, pellucides et contiennent des sporidies globuleuses qu'on n'aperçoit que difficilement et à un très fort grossissement du microscope composé." Montagne, without observing the true spores, clearly described basidia here, basidia with vacuolated contents, but he had not yet learned to recognize them as such.<sup>4</sup> Soon afterwards Fries (1849: 336), presumably inspired by Lévillé's work, introduced in the diagnosis of *Cyphella* the words, "sporoph. 4-sporis". *Solenia* he still retained at that time in the discomycetes but with the emphasis on "Discus non discretus."

*Peziza alboviolascens* (A. & S. per Pers.) Schw. (type species of *Lachnella* Fr.), a species that was to become a prominent member of *Cyphella*, has unusually large basidia and one would expect it to be among the first species for which basidia were recorded. This actually happened but because of the preconceived idea that it had asci, it was not recognized. For instance, when Bonorden (1851: 143 f. 215) came across it he called it *Myrothecium vitis* Bon., although clearly describing and depicting the basidia. Berkeley (1860: 368) acted in a similar manner: "Mr. Jerdon finds a plant very closely resembling [*Peziza alboviolascens*] on *Ulex*, with the fruit of a *Cyphella*. It is probably a sporiferous condition." The next year Berkeley & Broome (1861: 379) redescribed it as a new species, *Cyphella curreyi* Berk. & Br., with the remark: "This resembles very closely *Peziza albo-violascens*, but has the fruit of a *Cyphella* [that is, has basidia]. Mr. Currey was, we believe, the first to observe it; and the structure has been repeatedly brought under our notice by Mr. Jerdon."

Shortly afterwards several authors in rapid succession concluded that *P. albo-violascens* itself was basidiferous: the Tulasne brothers (1861: 134–135/136; 1865: 173/159<sup>5</sup>, <sup>6</sup>), the Crouan brothers (1867: 61), and Karsten (1867: No. 715; 1869: 191). The detection of basidia in other species up till then referred to *Peziza* or *Solenia* occurred simultaneously or shortly afterwards. Since Fries had introduced the basidia as a positive feature in the generic character of *Cyphella* (and had denied their presence in *Solenia*) these species were at first all referred to *Cyphella*, but when it became more and more obvious that the species of *Solenia* as defined by Fries also had basidia, most authors soon also admitted *Solenia* as basidiferous and retained both genera.

The recognition of *Solenia* (Fries's emendation) as a basidiferous genus proceeded

<sup>4</sup> For a similar case, in connection with *Aleurodiscus amorphus*, see p. 34.

<sup>5</sup> The Tulasnes considered this species the same as *Cyphella taxi* Lév. This is not the case. See also page 103.

<sup>6</sup> The double page numbers refer respectively to the original Latin work and to Grove's translation.

on the whole more slowly than in the case of *Cyphella*. We have seen that for some time the presumed absence of asci in *Solenia* was believed to be a distinguishing feature between the two genera. A retarding factor in the understanding of the nature of *Solenia* was undoubtedly contributed by Corda (1839: 39 pl. 6 f. 96) who depicted asci with spores in a fungus of the group of *Solenia anomala* (called *Peziza hoffmanni* Spreng. by him), although his drawings are, for that time, in other respects a remarkably accurate and detailed representation of the general structure of the fruit-body. He concluded, "Die Gattung *Solenia* selbst ist nur aus abnormen, ja monströsen Individuen einzelner Arten der Schüsselpilze (*Pezizae*) entstanden, und kann als nur imaginäre, in systematischen Schriften existierende Gattung nicht weiter anerkannt werden." A few years later Corda (1842a: 37; 1842b: 154), while still considering his *Peziza hoffmanni* as representative of *Cyphella*, stated somewhat less positively: "Wir . . . gestehen offen ein, keinen wesentlichen Unterschied zwischen dieser Gattung und *Peziza* bisher erkannt zu haben." Perhaps the first authors to record basidia in *Solenia anomala* were the Tulasnes (1861: 135/136). They remarked in a general way that outward similarity may be coupled with different modes of spore production. As a striking example they mentioned the case of *Peziza* [= *Solenia*] *anomala*, which differed from the true species of *Peziza* in the structure of the hymenium.

The following collection of excerpts from the work of the Tulasnes (1861, 1865) shows that they fully appreciated that both *Solenia* and *Cyphella* had basidia and in this respect differed from the true *pezizas*.<sup>7</sup>

"*Peziza albo-violascens* Alb. & Schw.<sup>[8]</sup> is retained by Berkeley among the true, i.e. ascophorous *Pezizas* (Outl. of Brit. Fung. p. 368, no. 58), although he mentions that Jerdon had met with this fungus in the state of a real *Cyphella*; from this he seems to suspect that *Cyphella* is a sporophorous (basidiophorous) state of *Peziza*. But we fear that no one has ever found [*Peziza alboviolascens*] truly ascophorous, and, therefore, it is wrong to place it among the *Pezizas*. We hold the same opinion about *Peziza anomala* Pers., which also finds a place in Berkeley's work (p. 369, no. 81) among *Pezizae* (*Tapesia*) . . ."—Tulasne (1861: 134-135/136).

". . . they are also deceived who, not noticing Persoon's warning, . . . have not recognized that his *Peziza anomala* (*Cyphella Hoffmanni* Tul.) is widely distinct from the true *Pezizas* in the structure of the hymenium. . . 'It is uncertain', says Persoon (Obs. Myc. part I, 1796, p. 29, no. 61), 'whether this species (*Peziza anomala* Pers.) finds its true place in this genus (*Peziza*), since it does not agree with the rest in its mode of growth, its changeable form, etc.; moreover up to the present I have not succeeded in finding thecae under the microscope; if the substance had been membranous and rigid, I would rather have placed it among the *Soleniae* . . .' In the previous year G. F. Hoffmann had already met with the same fungus, and had given it the name *Solenia ochracea* in the second part of his Deutschlands Flora for the year 1795, pl. 8, f. 2.<sup>[9]</sup> . . . Corda recognized hardly any distinction between *Soleniae* or *Cyphellae* and *Pezizae*, until he had been taught the true structure of the hymenium in *Cyphellae* by Lévillé. (Cf. his Anleit. z. Stud. d. Mycol. p. 153, 154, 193.) That is the reason why *Peziza anomala* Pers. or *Peziza Hoffmanni* Spreng. (*Solenia ochracea* Hoffm.)<sup>[9]</sup> is figured by Corda

<sup>7</sup> I follow Grove's translation.

<sup>8</sup> The Tulasnes applied this name to a mixture of three species (cf. p. 103).

<sup>9</sup> It is now generally accepted that *Solenia ochracea* Hoffm. is not synonymous with *Solenia anomala* as the Tulasnes thought it was.



among the true *Pezizas* (Icon. Fung. Vol. iii, 1839, p. 39, pl. 6, f. 96). But though that skilled mycologist asserts that the hymenium is composed of claviform, pellucid, and six-spored asci, while the spores are seen to be ovate and pallid, the figures which he gave scarcely convince us of this, for they show a theleporous hymenium, i.e. one much thinner than would be suitable for a *Peziza*, and thecae so vague and uncertain that we cannot help thinking that the draughtsman had incautiously made a mistake about their true nature. . . .”—Tulasne (1861: 135–136/137).

“We have already mentioned (supra, volume i, p. 136/[137] . . .) that *Peziza alboviolascens* Alb. & Schw. . . . once the type of Fries’s *Lachnellae* (Fl. Scan. p. 343), which Persoon called *fallax* (Myc. Europ. vol. i, p. 266, no. 118), belongs to the master of Upsala’s *Cyphellae*; we are therefore not surprised that de Notaris wasted his time by looking in it for true thecae. . . . At this opportunity we may be permitted here again to assert that *Peziza anomala* Pers. is nothing but a true *Cyphella* . . .; for . . . we succeeded in finding that fungus . . . with a hymenium manifestly provided with real basidia and abundance of spores in groups of four; the spores were such as are found in very many theleporoid fungi, shortly oblong-cylindrical, obtuse and somewhat inaequilateral, each at first supported on a short and often hardly visible sterigma.”—Tulasne (1865: 173/159).

Although the Tulasnes clearly differentiated *Peziza* (with asci) from *Cyphella* (with basidia) it may be remembered that they did not yet believe that asci and basidia are typical of widely different taxonomical groups of fungi. The basidia were for them not organs of precisely the same value as asci but rather comparable to such conidiophores as occur in imperfect states of pyrenomycetes. In this respect de Bary was ahead of them. Thus, the Tulasnes (1861: 135/136) remarked: “. . . [We] should be by no means surprised if one and the same pezizoid species should become at one time ascophorous (*Peziza*), at another basidiophorous (*Cyphella*), while keeping the same form, as happens among the *Sphaeriacei* . . .”

The occurrence of basidia in *Solenia* emend. Fr. was more generally acknowledged as late as around 1870 in different quarters at about the same time. Samples are:—

“[*Solenia*] has been placed amongst the Discomycetes from neglect of its mode of fruiting; the spores are produced as in *Cyphella*.”—Broome, quoted by Cooke (1871: 329).

“Ich habe mich jetzt überzeugt, dass weder bei [*Solenia anomala*], noch bei den anderen hierher gezogenen, Schläuche vorhanden sind.”—Fuckel (1871: 291). Basidia were described simultaneously for *Solenia spadicea* Fuck.

Fries never made it very clear what the real differences between *Solenia* and *Cyphella* were. In his final work (1874) he differentiated them thus.

*Solenia*: “. . . Tubuli membranacei, subcylindrici, turbinati, . . . terram definite spectantes, ore connivente, quo a *Cyphellis* differunt.”—Page 595.

*Cyphella*: “Fungi submembranacei, cupulares, raro plani, postice adnati, vulgo stipitato-porrecti, penduli. Hymenium definite inferum . . . *Soleniis* sine dubio proximum et ob characteres artificiales ab his remotum . . .”—Page 661–662.

Evidently he was not quite satisfied himself about the two being really different and one wonders how later mycologists could have been content with maintaining both. Patouillard (1900: 54) fused the two into a single genus which he subdivided into three sections. He considered this combination a very homogeneous group.

However, *Solenia* and *Cyphella* survived as distinct genera up till the present time and have remained artificial taxa not satisfactorily separated from each other. In my opinion this situation is best taken care of by recognizing a single artificial genus *Cyphella* embracing all 'Cyphellaceae' and from which the better known elements are to be removed as soon as a more natural position has been worked out for them.

*Aleurodiscus*.—*Peziza amorpha* Pers., the type species of *Aleurodiscus*, has disk-, or rather, lens-shaped fruit-bodies, centrally attached, with even hymenium, and upturned margin. It was originally logically described under *Peziza* and later sometimes either included in *Cyphella* itself or considered to belong to the 'Cyphellaceae'. A discussion on it and similar species may for this reason be included in the present notes.

It was the author of the species himself who began to doubt the inclusion of it among the pezizas (Persoon, 1822: 269): "Haecce species quoad structuram melius examinata, ut genus proprium ad familias *Thelephorarum* referri forsitan deberet et cui adnumeranda esset *Thelephora evolvens* . . ." Fries (1828: 183) did not think a new genus was necessary: he included it (with *Thelephora evolvens* Fr. per Fr.) in a special group of *Thelephora* Ehrh. ex Fr. that also contained *Thelephora salicina* Fr. This group is more fully discussed on pages 71–72 in connection with *Cytidia*.

It is not surprising that a new genus was thought necessary for this remarkable species. Rabenhorst (1874: No. 1824) introduced the generic name *Aleurodiscus* Rab. for it, but did not validly publish the name. He did neither supply a generic description nor a proper reference to a description, although he added drawings of the hymenial elements. This was not sufficient since the only original species was not a new one. The promise, "Das Nähere wird binnen Kurzem in der Hedwigia besprochen werden", he did not fulfil.

Rabenhorst's drawings of the hymenial elements show the spores, the sterile elements ('pseudophyses' of later authors), and the basidia which evidently were not recognized as such: the latter were all drawn without any indication of sterigmata and some of them show internal bodies that look remarkably like the separately drawn spores. Several years earlier de Bary (1866: f. 45) had published exemplary drawings of the basidia and their development, and of the spores; he even noted the fusion nucleus of the basidia. Without detracting anything from de Bary's merits, it should be pointed out that the basidia of this species are very favourable objects because of their large dimensions.

How difficult it was at that time to recognize basidia if one did not quite expect them is shown by a note by Berkeley (1860: 369); he emphatically denied their presence: "*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." When Peck (1872: 96 pl. 4 f. 23–26) came across the fungus he did not recognize it and established a new genus for it, calling the species *Nodularia balsamicola* Peck. He, too, did not recognize the basidia, and called them asci. The generic

name *Nodularia* Peck is pre-empted, and Cooke (1875: 136–137) pointed out that *Aleurodiscus* and *Nodularia* were identical. Saccardo (1881: 304–305), many years later, had his doubts about the presence of asci: “Verae endosporae maturae a nemine observatae; quare sic dicta nil nisi basidia videntur.” De Bary’s textbook (1886) seems to have been much neglected by contemporary mycologists, and the basidia had to be rediscovered independently by Richon (1877: 149 *fs.* 4, 5)—and again forgotten for quite a number of years!

Berkeley & Broome (1876: 137–138 *pl.* 9 *f.* 1) arrived at a complicated conclusion, although they are somewhat vague on precisely how the spores are formed. The figure shows them as bursting through the apex of the ‘clavate bodies’.

“The hymenium consists of colourless threads, and orange-coloured clavate bodies filled with pigment. These at length project beyond the surface, and produce four globose rough spores, .001 inch in diameter, which contain an angular body within which looks like a cystolith. After a time each spore becomes elliptic, and now measures .0012 inch in length, produces about eight elliptic echinulate sporidia in its cavity, which are from .0004–.0005 inch long—a circumstance without parallel, as far as we know, in Hymenomycetes. All these points have been observed by each of us independently . . .”

The next important step was made by Schroeter (1888: 429) who furnished the generic description necessary to validate the generic name *Aleurodiscus*. But he did more: he emphasized the exceptionally large basidia and spores and added to the cyphelloid type species—a totally resupinate fungus, *Corticium aurantiacum* (Pers. per Fr.) Sacc. This would prove to be a remarkable example of Schroeter’s acuteness, since no modern author has as yet ventured to remove it from the genus.

Towards a family of *Cyphellaceae*.—Although Fries (1874) acknowledged the affinities between *Porotheleum*, *Solenia*, and *Cyphella*, he placed the first two genera in the “Polyporei” and the third in the “Thelephorei”, which also included *Corticium amorphum* (Pers. per Purt.) Fr. and *Corticium salicinum* (Fr.) Fr. as species of *Corticium* Fr.

The first step towards a family of *Cyphellaceae* consisted of the re-uniting of *Cyphella* and *Solenia* within a single group. This was done, for instance, by Quélet. That author at first admitted a family “Auricularii” (1886: 201) which agreed with Fries’s Thelephorei except for the inclusion of *Auricularia* Bull. This genus had as species, to mention only the prominent ones, *Auricularia mesenterica* (Dicks. per S. F. Gray) Fr., *Hirneola auricula-judae* (Bull. per St.-Am.) Berk., *Cyphella ampla* Lév. (as *Auricularia leveillei* Quélet.), and *Corticium salicinum*. Soon afterwards, Quélet (1888: 24) distinguished within the “Auricularii” a tribus “Cyathini” consisting of (i) *Auricularia* Bull., with *A. tremelloides* (Bull. per St.-Am.) Mérat (= *A. mesenterica*), *Hirneola auricula-judae*, *Cyphella ampla*, and *Corticium evolvens* (Fr. per Fr.) Fr.; (ii) *Cytidia* Quélet., a new genus for *Cytidia rutilans* (Pers.) ex Quélet. (= *Corticium salicinum*); (iii) *Calypsiella* Quélet., a segregate from *Cyphella*; (iv) *Cyphella*, to which *Corticium amorphum* had been transferred; and (v) *Solenia*.

At about the same time J. Schroeter (1888: 433) established within the family "Thelephorei" a "Gruppe Cyphellei" including both *Solenia* and *Cyphella*—as well as *Craterellus*.

It was left to Patouillard (1900: 52) to write the most noteworthy synopsis of the 'Cyphellaceae'. This survey, concise as it is, is well informed and clearly demonstrates that he had the best first-hand knowledge on a world-wide scale of these fungi. His "Cyphellés" (as a part of his "Porohydnes") comprise the genera *Aleurodiscus*, *Cytidia*, *Cyphella* (fused with *Solenia*, and also including *Calyptrella*), *Porotheleum*, *Punctularia* Pat., and *Phaeocyphella*. Here, the three genera *Cyphella*, *Solenia*, and *Porotheleum* appear all united in the same taxon. The genus *Punctularia* is in many respects so different from the rest that it may as well be excluded from further discussion: the resupinate fruit-body bears blunt warts or ridges instead of cups and the hymenium is localized on these warts only, thus somewhat suggesting many individual 'fruit-bodies' on a common 'stroma' as in *Porotheleum*.

Maire (1902: 99) introduced the family name "Cyphellacées", which he applied in a very broad circumscription, viz. for all Aphyllporales with chiasitic basidia and with smooth, tuberculose, or folded hymenium. One of the tribus is the "Cyphellées" which practically correspond to the "Cyphellaceae" of most modern authors, for instance of Pilát (1925b).

The number of genera has not been much increased since Patouillard's account of 1900. A few small new genera have been generally accepted. Other additions removed from other families have not been admitted by all authors. In this connection may be mentioned as examples: *Chlorocyphella* Speg., hailed as lichenized cyphellas, still admitted by Pilát (1925b: 45), but in reality imperfect fungi either lichenized or parasitic on lichens; and *Fistulina* Bull. per Fr. included by Lohwag & Follner (1936), a disposition that was foreshadowed by remarks by Fries.

This inclusion of *Fistulina* is in my opinion far-fetched. The differences from *Porotheleum* (which acted as the magnet) are so enormous that little more than a formula like, 'possessing densely crowded but discrete cups or tubes on a common body' holds the two together, but little else. Bondartsev & Singer (1941: 44, 45) accepted the inclusion of *Fistulina*; they admitted a suborder Cyphellineae, which they divided into two families, the Cyphellaceae, and the Fistulinaceae in which they placed both *Porotheleum* and *Fistulina*.

Some years later Singer (1945) divided the Cyphellineae (without any mention of the Fistulinaceae) into (i) the Cyphellaceae, to which were added *Rimbachia* and *Arrhenia*, and (ii) the Leptotaceae<sup>10</sup> which comprised *Leptotus* (but not *Leptoglossum* P. Karst.), *Campanella* P. Henn., and *Favolaschia* (Pat.) Pat. apud Pat. & Lagerh. It is difficult to understand some of the additions, especially of *Campanella*. From a later publication it appears that Singer (1951: 735) is no longer certain of the position of the components of the Leptotaceae.

<sup>10</sup> Leptotaceae R. Maire, nomen nudum, formerly tribus Dictyolées Maire; correct name, Dictyolaceae Gäum.

The genus *Leptotus* is a good example of the difficulties that arise if one is determined to uphold a family Cyphellaceae. One may differ in opinion on whether or not *Leptotus* P. Karst. [type, *Cantharellus retirugus* (Bull.) per Fr.] and *Leptoglossum* P. Karst. [type, *Cantharellus muscigenus* (Bull.) per Fr.; synonym, *Dictyolus* Quél.] should form a single genus, but with our present knowledge one can hardly doubt that they are closely related. Some modern authors combine the two and Singer (1951: 735) even includes a centrally stalked species, *Omphalia muralis* (Sow. per Fr.) Quél. sensu Ricken under the name of *Leptotus rickenii* Sing. If one believes the 'Cyphellaceae' to represent a good family one will be inclined to keep *Leptotus* (fruit-body dorsally attached) distinct from *Leptoglossum* (with lateral stalk), place the former genus in the Cyphellaceae, and not admit the latter. This is, in my opinion, an altogether artificial solution, that would at once raise the question why the cupulate agarics in general are not transferred to the 'Cyphellaceae', for the latter 'family' already contains a number of species that often develop pronounced folds which may be difficult to distinguish from obtuse gills (*Cantharellus retirugus*, *Cyphella ochroleuca* Berk. & Br). An agaric genus like *Resupinatus* (C. Nees) per. S. F. Gray has its counterpart among the 'Cyphellaceae' in *Stigmatolemma*.

*Aleurodiscus* has also been a problem from the start. It was a name originally given to *Corticium amorphum* only, but J. Schroeter (1888: 429) added to this species with a disk-shaped, centrally attached fruit-body another species which is completely resupinate and has not yet been removed from the genus. It is, therefore, understandable that *Aleurodiscus* has been placed by some (Patouillard) in the 'Cyphellaceae' and by others in the 'Thelephoraceae' (or, better, Corticiaceae). Pilát (1926: 206) made it a special group (Aleurodiscinae) of the Corticiaceae. He was followed by Killermann (1928: 142) who also included *Cytidia* in the tribus Aleurodisceae.

The preceding outline of the history of the 'Cyphellaceae' shows that the family has been widely accepted for a considerable period up till the present time. Recently W. B. Cooke (1957) adopted the group presumably in about the same sense as it has been delimited by Pilát. Yet a careful study of many prominent species has convinced me that the 'Cyphellaceae' are a very heterogeneous assemblage that has not the slightest right to exist. The diverse elements have been held together by superficial likeness but evidently are of various relationships. I believe that Romagnesi (1950) is basically correct when he considers a number of species closely related to, and inseparable from, different groups of agarics, like the Marasmiaceae, Pleurotaceae, and Naucoriaceae (as he understands these taxa). I had reached similar conclusions in regard to a great part of the 'Cyphellaceae' when I met Dr. R. Singer in 1946 (cf. Singer, 1951: 312, *Flagelloscypha* Donk, 343, *Lachnella* Fr., 345, *Merismodes* Earle). I would now mention the Schizophyllaceae as another group (independent of the agarics in my opinion), to which a number of 'Cyphellaceae' show relationship, and there is more in this vein, that I hope to discuss in the present series.

**Relationship and phylogeny.**—If one includes in a single taxon the horse, the sea elephant, and the mouse and declares them all closely related, one will get a group with relationships in various directions. This is about what has happened with the ‘Cyphellaceae’.

The moss-inhabiting species that were later to be transferred to *Cyphella* were classed by Persoon as species of *Thelephora* Ehrh. ex Fr. On the occasion of the publication of *Thelephora muscigena* Pers. he remarked, “In hymenio subrugulosa est, hinc *Merulius affinis*” (1801: 572). When he introduced *Thelephora* subgen. *Epibryus* Pers. (1822: 115) for this and another species, he again stated that the taxon was close to the muscigenous species of *Merulius* (Persoon’s sense). It may be surmised that he thought of such species as *Merulius muscigenus* (Bull.) Pers., *M. retirugus* (Bull.) Pers., *M. lobatus* Pers. which he entered in *Merulius* subgen. *Cantharellus* (Juss.) Pers. and which Fries (1821) placed in *Cantharellus* Adans. per Fr. together with *Thelephora muscigena*. Afterwards the moss-inhabiting species with an even hymenium were artificially separated from *Cantharellus* and transferred to *Cyphella*. Having done this Fries (1822: 201) declared, “*Cyphella* . . . Genus . . . ad *Pileatos*, speciatim *Cantharellus*, accedit.” Of course others agreed:

“On pourrait, à la rigueur, laisser le *Cyphella* à côté du *Thelephora*, parce que son hymenium est lisse; mais je pense qu’il conviendrait mieux de le rapprocher du genre *Cantharellus*, dont plusieurs petites espèces comme le *C. muscigenus*, *bryophilus*, *retirugus*, etc., présentent la consistance, la structure et la disposition des spores, et qui n’en diffèrent que par les lames ou les plis de l’hymenium.”—Lévillé (1841: 239).

When it became evident that *Cantharellus* was a very mixed group, the remaining moss-inhabiting species of this genus were placed in *Dictyolus* Quéél. (in part) = *Leptoglossum* P. Karst. + *Leptotus* P. Karst., and the name *Cantharellus* became substituted by these in discussions on relationship.

It is interesting to note that Persoon (1822) was inclined to associate *Solenia* with such genera as *Boletus* (broad sense, inclusive of *Polyporus sensu lato*). Thus he remarked under *Solenia fasciculata* Pers. (p. 335): “Haec et antecedens [which means, the genus *Solenia* as a whole], in serie fungorum (praesertim generum majorum) a completis ad simplices aut vice versa, *Boleti* (*Poriae*) esse videntur, qui se tantum ut *tubulos* exhibent.”

When Fries decided to remove *Solenia* and *Cyphella* from the discomycetes and to arrange them among the hymenomycetes, *Solenia* was classed in the “Polyporei” along with *Porotheleum* (Fries, 1874). This genus he associated from the start with *Polyporus* and also compared it with *Solenia* at a very early date (Fries, 1821: 506) when he added to *Polyporus* subgen. *Porotheleum* (Fr.) per Fr. the definition “Asci nulli. (*Solenia*).” The theoretical implication behind this arrangement is that *Solenia* had ‘free’ pores (tubes) and that a whole colony is comparable to a single fruit-body of a resupinate species of *Polyporus* (*Poria*). Incidentally, Persoon (1796: 29) had already remarked about *Peziza anomala*: “Hab. . . . ad ramos dejectos, ubi

multa individua ita conferte sibi que approximata crescunt, ut quasi unum repraesentent fungum." He also suggested the relationship of *Solenia* with *Poria* (see above). Fries's ideas were summarized thus:—

"*Solenia*. . . . Receptaculum nullum. Tubuli . . . ore connivente, quo a *Cyphellis* [Thelephorei] differunt. / *Cyphellis* maxime affine genus, sed ab illarum typicis speciebus magis recedit, quam ut conjungatur. Ex altera parte *Porotheiis*, neglecto horum receptaculo, prope accedit. Suadente genere *Mucroniarum*, quod nudos tantum aculeos, proponitur tamquam infimus gradus Polyporeorum, ad quos quaedam species accedunt. Evolutio tubulorum cum *Fistulinae* analogae. Cum *Pezizis* ob defectum disci ascigeri non potest comparari."—Fries (1874: 596–597)

This is Fries's matured view of the relationship of the three oldest genera of 'Cyphellaceae' in a nutshell. It dominated the situation for a long time and has not yet been totally abandoned. A remarkable later development is (or, perhaps, was) the renewed inclusion in *Poria* of *Porotheleum fimbriatum* (the type of *Porotheleum*) by American authors like Lloyd, Overholts, and Lowe. This is (was) definitely a long step back because the differences between the two genera are great.

Various authors have accepted the early suggestion of a close relationship between *Porotheleum* and *Fistulina*. For instance, J. Schroeter (1888: 494) associated the two in a special group of the Polyporaceae, while Lohwag & Follner (1936) transferred *Fistulina* to the 'Cyphellaceae' of which they considered *Porotheleum* a member. We have also seen that Bondartsev & Singer (1941: 44, 45) provided for a family of Fistulinaceae (*Fistulina* and *Porotheleum*) of the suborder Cyphellineae.

If artificial genera like *Cyphella*, *Solenia*, and *Porotheleum* are combined in a single group, and such as *Aleurodiscus* and *Cytidia* added as well, and if in addition one keeps to the supposed relationships, the 'Cyphellaceae' will show relations to the Corticiaceae (*Aleurodiscus* and *Cytidia*), the Polyporaceae and/or the Fistulinaceae (*Porotheleum*), and the Agaricaceae and/or the Cantharellaceae (moss-inhabiting cyphellas). For a full review of the phylogenetic speculations in this connection, augmented with personal conclusions, see Pilát (1925b: 41–52).

Here, the following recapitulation may suffice. The origin of the 'family' has been sought in (i) the Corticiaceae, especially in *Corticium* Fr. by the earlier authors on the subject, by Pilát (who also mentions *Merulius* Fr.), and by Gäumann (1926: 505); and (ii) in *Dictyolus* (= *Leptoglossum* plus *Leptotus*) by Maire (1902: scheme opposite p. 195) and by Vuillemin (1912: 362, scheme).

The following taxa have been considered derived from the 'Cyphellaceae' (i) the Polyporaceae (Maire, Vuillemin, Pilát); (ii) the Fistulinaceae (Gäumann); and (iii) *Leptoglossum*, including *Leptotus* (Pilát); and (iv) the Corticiaceae (Maire).

*Chlorocyphella* Speng. (which is non-basidiomycetous) also readily found a place in some schemes of derivations as a lichenized member of the 'Cyphellaceae' without an actual study of its species.

## 3.—EXCLUDED GENERA AND SPECIES

## Excluded genera

The following genera were, or have been, at some time or other admitted to the 'Cyphellaceae' or 'Cyphellineae', but do not fall under the character given above for that family, or are better excluded for other reasons. As for Maire's "Famille des Cyphellacées" (1902: 99), only the genera he included in his "Tribu des Cyphellées" have been taken into account. A few odd genera are also discussed to facilitate reference to them.

*Campanella* P. Henn. — Referred by Singer (1945: 179) to the "Cyphellineae" (fam. Leptotaceae). The hymenophore varies from 'meruloid' to lamellate; usually the pattern consists of a few radiating gills with anastomoses of varying height, but this initial condition may become more complicated and finally difficult to observe. The genus should be excluded from the 'Cyphellaceae' as here defined and seems better placed among the agarics. There may be a short lateral stalk present, but in most species the fruit-body is cyphelloid.

The key-character Singer (1945: 185) uses to separate *Campanella* from *Leptotus* is the nature of the context, viz. hyphae gelatinous for the first, and hyphae not gelatinous for the second genus. In addition, in the generic description Singer (1945: 190) introduces for *Campanella* the presence of "dichophyses on sterile surfaces forming a more or less conspicuous asterostromelloid structure". These 'dichophyses' are hardly comparable to the true dichophyses (= dichohyphidia) of the corticiaceous genus *Vararia* P. Karst. (*Asterostromella* Höhn. & L.). These branched hyphae may be much reduced, but are interesting as they call to mind similar bodies in some agaric genera, *Dictyopanus* Pat., *Mycena* (Pers.) per S. F. Gray *sensu lato*. It may be questioned if these 'dichophyses' are essential to the generic character.

For the moment I would suggest inclusion in *Campanella* of *Arrhenia flabellula* (Berk. & C. ex Cooke) Dennis, which has been reported as synonymous with *Rimbachia cyphelloides* (J. Rick) ex Lloyd.

*Chaetocypha* Corda. — The genus was introduced for a single species, *Chaetocypha variabilis* Corda, which Fries identified with *Cyphella goldbachii* Weinm. Because O. Kuntze (1891: 847) considered *Cyphella* Fr. a later homonym of *Cyphelium* Ach., he substituted *Chaetocypha* for *Cyphella*.

However, there is no sufficient reason to accept Fries's identification of *Chaetocypha variabilis* with *Cyphella goldbachii*. Corda's species has not been recognized by later mycologists and the author himself soon indicated that the name should be buried. Donk (1951: 208) does not consider it a basidiomycete. In any case I do not recognize a cyphella in Corda's fungus and, therefore, have to exclude it from consideration. For my interpretation of *Cyphella goldbachii*, see pag. 85.

*Chlorocyphella* Spig. — When this genus was published the author remarked, "Genus Hymenolichenibus certe pertinens." Keissler (1927) gave a good



account of it, but did not at the time deny its basidiferous nature; he could not clearly make out the basidia. Mameli-Calvino (1930) concluded that the spores were not formed on true basidia and that the fructification was that of imperfect fungi. Keissler regarded the species as "Flechtenparasiten" rather than as lichens producing cyphella-like fruit-bodies; Santesson (1952: 41) speaks of parasymbionts. However, Mameli-Calvino concludes that *Chlorocyphella subtropica* Speg. is a lichen, and sets up a special group of Deuterolichenes for the genus. Keissler also found that *Campylidium* Müll.-Arg. (1881) and *Orthidium* Müll.-Arg. (1890) are synonyms, but he rejected these earlier names in favour of *Chlorocyphella* (1909) because their author had given them to what he supposed to be (basidiferous!) anamorphoses of lichens—hardly a valid reason for rejecting them with our present knowledge about the true nature of the 'basidia'. Santesson identifies *Chlorocyphella* with *Pyrenotrichum* Mont. (1843: 376), a name still earlier than those of J. Müller and *Chlorocyphella*. He lists nine species for the genus; a few of these received names under *Cyphella*, viz. *Pyrenotrichum splitgerberi* Mont. (*Cyphella aeruginascens* P. Karst.; *C. subcyanea* Ell. & Ev.; *C. lichenicola* Keissl.) and *P. foliicola* (Vain.) R. Sant. (*Cyphella foliicola* Vain.).

*Corniola* S. F. Gray. — See under *Leptoglossum*.

*Craterellus* Pers. — Schroeter (1888: 436) placed this genus in his "Gruppe Cyphellei" along with *Solenia* and *Cyphella*. It is currently classed among the Cantharellaceae. In any case there is no good reason to consider it cyphellaceous.

*Dacryobolus* Fr. — *Odontia sudans* (A. & S. per Fr.) Bres. = *Dacryobolus sudans* (A. & S. per Fr.) Fr. forms thin, somewhat watery looking, closely adherent fruit-bodies bearing teeth with diaphanous, coloured, resin-like bodies resembling minute drops, a single one of which occupies the axis and tip of each tooth. When the teeth are viewed from above they appear hollowed-out, especially if the bodies have fallen away. These 'cups' are sterile inside (the hymenium lines the outside) and thus are quite different from the cups of *Stromatoscypha*. For details, see Lohwag (1931: 89-91 f. 1) and compare the fine photographs published by Lloyd (1917: fs. 1110, 1111). I agree with Eriksson (1958: 115) that *Odontia sudans* might well be taken to represent a genus of its own (*Dacryobolus* Fr.).

This fungus has several times been described as a new species of *Porothelium* = *Stromatoscypha*, which is why it is here entered among the excluded genera. For examples or possible examples of these species of 'Porothelium', see the discussion of excluded species below: *P. confusum* Berk. & Br., *P. hydnoideum* Berk., *P. papillatus* Peck, and *P. stvensoni* Berk. & Br. On the other hand, *P. friesii* Mont. is not one of these.

*Dictyolus* Quél. — See under *Leptoglossum*.

*Discocyphella* P. Henn. — Type species, *Discocyphella marasmioides* P. Henn. & Nym. apud P. Henn. The generic name is rather misleading: the species is cen-

trally and ventrally stalked. Hymenophore smooth. Not to be included in the 'Cyphellaceae'. To Singer (1951: 373), practically a nomen dubium. Patouillard (1900: 147) and von Höhnell (1911: 167) referred it to *Cymatella* Pat. which Singer (1951: 310) treats as an agaric genus close to *Marasmiellus* Murrill emend. Sing.

*Favolaschia* (Pat.) Pat. apud Pat. & Lagerh. — Referred by Singer (1945: 174) to the "Cyphellineae" (fam. Leptotaceae). Since the hymenophore is tubulose, the genus is left out in the present paper because the (artificial) family character adopted above excludes taxa with 'compounded' hymenophore. Inclusion among the agarics seems the best solution, but if there is an objection to this course, the genus might be placed in the Polyporaceae, which in the current wide circumscription is quite artificial. Compare also Singer (1951: 732).

Several of the smaller species look like discomycetes, a resemblance which is in some cases expressed in the specific epithets ('pezizaeformis', 'pezizoideus') and on superficial examination may be confused with cyphellas. Some species which have only a few tubes (pores) to the fruit-body may develop individual fruit-bodies that have only one. Such fruit-bodies are 'cyphellaceous' in the strict sense of this paper; the accompanying compound ones have been described as 'aggregate' by some authors. One or two species that have been included in *Cyphella* are discussed below: *Cyphella subceracea* P. Henn., and compare also *C. australis* Speg. and other species.

*Fistulina* Bull. per Fr. — The prevailing tendency is to classify this genus in a family of its own among the Aphyllophorales, or in a subfamily of the Polyporaceae. See comments on page 36.

*Hypolyssus* Pers. sensu Berk. = *Caripia* O.K. (cf. Donk, 1957a: 23). — Herter (1910: 132) placed this genus among the Cyphellaceae, apparently because of a complete misunderstanding of the structure of the fruit-body. The hymenium lines the outside (underside) of a turbinate, solid cap.

*Leptoglossum* P. Karst. — The type species, *Cantharellus muscigenus* (Bull.) per Fr. has laterally stalked fruit-bodies and, therefore, falls outside the 'Cyphellaceae' as defined above. *Corniola* S. F. Gray (preoccupied) and *Dictyolus* Quéll. are typonyms and to be rejected. The genus is often rather broadly conceived (sometimes under the incorrect names *Leptotus* or *Dictyolus*) by the inclusion of species with dorsally attached fruit-bodies like *Cantharellus retirugus* (Bull.) per Fr.; and, also, by the inclusion of cup-shaped species with more or less typical gills, which in most cases should be transferred to the agarics. As to the position of *Leptoglossum*, it would seem that it may also be placed close to some species that are currently considered to be agarics, like *Pleurotus tremulus* (Schaeff. per Fr.) Kummer and *Omphalia muralis* (Sow. per Fr.) Kummer sensu Ricken. Singer (1951: 735) even included these species in '*Leptotus*'.

The character given above of the 'Cyphellaceae' necessitates treating of the group without lateral (or central) stalk as cyphellaceous, and some of its components

will be discussed in a future instalment; the stalked species will be left out of account. See also remarks on page 37.

If one decides to keep apart from the species with stalked fruit-body such (musci-colous) species as *Cantharellus retirugus*, these should be excluded under the name *Leptotus*.<sup>11</sup> If one considers the types of *Leptotus* and of *Leptoglossum* congeneric, then the latter name is the correct one (cf. Donk, 1951: 214). The incorrect use of *Leptotus* for this product of fusion has caused the introduction of several stalked species into *Leptotus*. These are:

*Leptotus glaucus* (Batsch per Fr.) Maire, *Cantharellus glaucus* (Batsch) per Fr., which (if correctly interpreted) has been made type of *Geotus* Pilát & Svrček (1953).

*Leptotus muscigenus* (Bull. per Fr.) Maire, *Cantharellus muscigenus* (Bull.) per Fr., type of *Leptoglossum* P. Karst.

*Leptotus rickenii* Sing. (nomen nudum), name change for *Omphalia muralis* (Sow. per Fr.) Quél. sensu Ricken, which is centrally stalked and not evidently musci-colous.

*Leptotus tremulus* (Schaeff. per Fr.) Sing., *Pleurotus tremulus* (Schaeff. per Fr.) Kummer, with typical gills and truly agaric.

*Marasmius* Fr. — Among the species of this genus, there are a number (especially of those occurring in the tropics) in which the fruit-body has a reduced stalk which may virtually disappear as the fungus develops or is completely stalkless (fruit-body dorsally attached). If in addition, the gills are reduced, sometimes to the point of a completely smooth hymenium, it is not surprising that confusion with *Cyphella* arises. When one finds in the tropics 'sessile' cyphellas on small twigs or on coriaceous leaves, with asymmetrical fruit-body, they will usually belong to these species of *Marasmius*. The lateral notch represents the place where the stalk is or was to be found. Similar conditions occur in minute species of *Pleurotus* (Fr.) Kummer (*sensu lato*) and *Clitopilus* (Fr.) Kummer, but in these genera the tendency to develop a smooth hymenophore is hardly evident. These species of *Marasmius* are often associated with thread blights. Petch (1924: 19–23) recognized *Cyphella pulchra* Berk. & Br. as one of them. Recently *Marasmius cyphella* Dennis & Reid (1957: 288 f. 2) was described from among these fungi. I suspect that *Cyphella juruensis* P. Henn. and *C. reniformis* Pat. are additional examples.

*Peniophorina* Höhn. — The genus was introduced for a single species that was identified with *Chaetostroma pedicellatum* Preuss. The author considered it basidiomycetous, and if this were true it would be sought for among the 'Cyphellaceae' rather than among the Corticiaceae (lens-shaped fruit-body, but no stalk). However, Donk (1951: 216) concludes that it is non-basidiomycetous.

*Pistillina* Quél. — It has been suggested that this genus may be related to *Cyphella* (Coker, 1923: 6). Since the 'disk' is convex and the fruit-body plainly

<sup>11</sup> Some would perhaps consider *Leptotus* P. Karst. preoccupied by two (orthographically slightly different) homonyms, *Leptotes* Lindl. (1833) and *Leptotis* Hoffmanssegg (1824). In that case a new name should be coined.

stalked, it is best placed for the time being among the 'Clavariaceae', in its current delimitation an artificial family. See Corner (1950: 107, 497). It is suggested below (p. 47) that *Cyphella agariciformis* Pilát belongs to *Pistillina*.

*Pleurotopsis* (P. Henn.) Earle. — See under *Plicatura* Peck.

*Plicatura* Peck. — Donk (1951: 217) listed *Plicatura* and *Pleurotopsis* (P. Henn.) Earle as cyphellaceous. The reasons for so doing were, first, that he considered the two congeneric, and, secondly, that young fruit-bodies are more or less typically cyphellaceous and that there are a number of cyphellas which seem to be closely related to species of *Plicatura*. Mature fruit-bodies are usually too big to make a cyphellaceous impression and, in addition, have a strongly folded hymenophore. However, the edges of the folds remain fertile. For the present the genus will be left out of account, but I hope to return to it in a further paper of the present series.

*Punctularia* Pat. — Patouillard (1900: 57) stressed: "Hyménium limité à la surface des tubercules" and thought it came near to *Porothelium*, "dont il est en quelque sorte une forme à hyménium convexe ou plan." In other words, if one conceives the cups lined on the inside with the hymenium of *Stromatoscypha* replaced by warts to which the hymenium is limited, this would result in a genus like *Punctularia*. The comparison is evidently far-fetched and there should be little hesitation in excluding *Punctularia* from the "Cyphellaceae". For a recent account of the genus, see Talbot (1958: 140).

*Skepperiella* Pilát in Bull. Soc. mycol. France 43: 56. 1927. — The type species is *Skepperia spathularia* (Berk. & C.) Pat. which is referred to *Rimbachia* Pat. by Singer (1951: 741). Apparently it has a lateral stalk, and if so, it cannot belong to the 'Cyphellaceae' as circumscribed in the present paper. It may be that the stalk is only seemingly lateral and is actually strongly excentric, and dorsally attached, in which case it falls within the limits of the 'family' together with *Rimbachia*. Compare Singer (l.c.), "We may, for the sake of comparison, liken *Rimbachia* to *Peziza*, and *Skepperiella* to *Otidea*. Both *Skepperiella* and *Otidea* are weak genera at least in regard to the main distinguishing feature, the spathulate instead of pezizoid habit."

*Stereophyllum* P. Karst. — Only original species, *Stereophyllum pallens* P. Karst. A later described species is *S. boreale* P. Karst. The latter has been considered conspecific with one of the muscicolous cyphellas.

The type species was insufficiently described (no microscopical details). Karsten himself thought, "Affine videtur *Stereo cyphelloidi* Berk. et C." and his description compares well with a recent one of the latter species published by Welden [1958: 42; as *Cotylidia cyphelloides* (Berk. & C.) Welden]. If there is really affinity between the two, it would seem advisable to reconsider the inclusion of *Stereophyllum* (name preoccupied) in *Cotylidia* P. Karst., and to look more closely into the relationship of *Cotylidia cyphelloides* and *Thelephora muscigena* Pers. [≡ *Cantharellus laevis* Fr. ≡ *Cyphella laevis* (Fr.) Lundell].

*Trabecularia* Bon. — This has for a long time been a forgotten genus. Its generic character places it in the 'Cyphellaceae'. Donk (1951: 220; 1958: 14) considers it merely a form of *Merulius tremellosus* Schrad. per Fr. If this disposition is accepted as correct, *Trabecularia* is better excluded from the 'Cyphellaceae' as long as *Merulius* Fr. is not included in that artificial taxon. Some species of *Merulius* have more or less disk- to cup-shaped young fruit-bodies, and in my opinion the cyphellaceous genus *Auriculariopsis* Maire (see p. 76) is difficult to separate from *Merulius*.

*Trogia* Fr. — The genus was introduced for tropical agarics that are not at all likely to be confused with cyphellas, but in later work Fries extended the limits to include such species as were classed afterwards as *Plicatura* Peck. Compare: "*Trogia* . . . in India orientali hactenus tantum lectum, *Cyphellis* affinitate proximum! [*Trogia crispa* (Pers. per Fr.) Fr., *Cantharellus crispus* (Pers.) per Fr.] . . . cum genuinis *Trogiis* congruit, ut ad idem genus referre non dubitem . . ."—Fries (1863: 244). European and North American authors, who did not know the original tropical elements, followed Fries's lead and substituted the name *Trogia* for *Plicatura*. The two genera are widely different; *Trogia* belongs to the agarics (cf. Singer, 1951: 207).

*Urceolus* Velen., Novit. mycol. 44. 1939. — A monotypic genus based on *Urceolus sambucinus* Velen., a species with urceolate fruit-body with vein-like gills. Presumably a 'reduced' agaric. Velenovský wrote: "Ego autem censeo, hanc speciem et *Pl[eurotus] Leightonii* Berk. itidem sub gen. *Urceolus* referendas esse."

*Wiesnerina* Höhn. — *Peniophorina* Höhn. and *Wiesnerina* have both pin-head-shaped fruit-bodies, sessile with constricted base. They have been placed in the 'Theleporaceae' (Corticaceae). Killermann (1928: 138, 139; *Peniophorina* as a section of *Peniophora* Cooke) even placed them next to *Corticium* and *Peniophora* in a tribus Corticieae, which he defines as having the "Frk. ausgebreitet . . ."! However, in an artificial system the two genera would probably be sought among the 'Cyphellaceae' and Donk (1951: 264) listed them in that connection: they are rather cyphella-like, but with the 'disk' convex (and no evident stalk), as in certain groups consistently referred to the discomycetes. It was not Donk's intention to enter them taxonomically into the 'Cyphellaceae': *Peniophorina* he simultaneously excluded as non-basidiomycetous. Of *Wiesnerina* he noted at that time, but only in manuscript: "*Wiesnerina* Höhn. resembles in general structure *Dimorphocystis capitatus* Corner (Clavariaceae), but it lacks the stalk. Corner's figures (1950: fs. 170, 171) of the capitata portion of the fruit-body roughly apply to *Wiesnerina*. However, the cystidia are different in some respects from those described in the three species of *Dimorphocystis* Corner."

In the meantime Boedijn (1959: 11) has found that the correct name for *Dimorphocystis* is *Actiniceps* Berk. & Br. and he also includes *Wiesnerina* in that genus. For the present I would not yet subscribe to that solution; it appears that *Wiesnerina*

may be a closely related but different genus. Boedijn, moreover believes that *Actiniceps* belongs to the "Thelephoraceae". This, apparently, should be understood as 'Thelephoraceae *sensu latissimo*', since there is certainly no close relation with the Thelephoraceae as recently emended ('Phylacteriaceae'). Since the fruit-body may be frankly stalked, and the stalk in *Wiesnerina* may be interpreted as present but very short, it might be advisable to refer *Actiniceps* (and *Wiesnerina*) to the artificial family 'Clavariaceae', as has been done for *Dimorphocystis* by Corner.

If the stalk of *Actiniceps* can be imagined so strongly reduced that the fruit-body becomes a sessile, shortly obconical body with the hymenium limited to the convex surface at the top one will arrive at a fruit-body as it occurs in *Wiesnerina*. The latter genus now includes two species, both tropical, which both differ from *Actiniceps* in the cystidia. These are similar in both genera to this extent, that a cystidium from either is thick-walled, somewhat ventricose in the lower half, its lumen sometimes widened there but always abruptly expanded toward the apex. However, in *Wiesnerina*, the surface of the cystidia is densely and regularly studded with papillae all over, except at the extreme tip and around the base. In *Wiesnerina secunda* Höhn. from Java the cystidia tend to swell in KOH solution and in this respect remind one of *Lachnella* (p. 97). I have not studied the Brazilian species *W. horrida* Höhn.

#### E x c l u d e d s p e c i e s

The following enumeration deals with those species that have been referred to the genera listed in Table I as cyphellaceous, but that should be excluded from the 'family'. An exception is made for ascomycetous species included in *Lachnella*. The name *Lachnella* has for a long time been erroneously applied to a genus of discomycetes in various delimitations. On the other hand, cupulate (not strictly laterally or ventrally stalked) species that have been placed in *Dictyolus* and *Leptoglossum* and that are better excluded from the 'family' may also be looked for in this enumeration, which, however, is by no means to be regarded as exhaustive. The synonymy is in most cases not complete.

*acericola*. — *Nodularia acericola* Peck in Rep. New York St. Mus. nat. Hist. 25: 98. 1873 (n.v.). — *Pezicula acerina* (Peck) Peck *apud* Sacc. & Berl. in Atti Ist. veneto VI 3: 725. 1885; Seav., N. Amer. Cup-fungi (Inop.) 342 pl. 141 f. 1. 1951.

Not congeneric with the type species of *Nodularia*, which is synonymous with the type species of *Aleurodiscus*. The above mentioned species is an inoperculate ascomycete; compare Seaver (l.c.).

*aeruginascens*. — *Cyphella aeruginascens* P. Karst. in Hedwigia 28: 191. 1889. — *Chlorocyphella aeruginascens* (P. Karst.) Keissl. in Annal. naturh. Mus., Wien 41: 159 f. 1. 1927.

Fide Santesson (1952: 49, 50) = *Pyrenotrichum splitgerberi* Mont. See also under *Chlorocyphella* (p. 40).

*agariciformis*. — *Cyphella agariciformis* Pilát in Hedwigia 66: 262 f. B. 1926

This species was described from Bohemia and found on stalks of *Juncus glomeratus*. Judging only from the original account I suggest that it is the same as *Pistillina typhae* (Höhn.) Donk. The general shape of the fruit-body, the consistency (subgelatinous), the spores (“langlich-elliptisch, nach unten langsam zugespitzt, 8–9  $\mu$  lang, 3,2–3,6  $\mu$  breit”), as well as the habitat, all point in this direction. For a note on the genus *Pistillina* Quéll., see above (p. 43).

*annulatus*. — *Peziza annulata* Holmskj., Fung. dan. 2: 30 pl. 13. 1799 (devalidated name). — *Peziza annulata* Holmskj. per Fr., Syst. mycol. 2: 106. 1822. — *Solenia annulata* (Holmskj. per Fr.) Fr., Hym. europ. 597. 1874. — *Henningsomyces annulatus* (Holmskj. per Fr.) O.K., Rev. Gen. Pl. 3 (2): 483. 1898.

As far as I have been able to find out, a fungus as yet unidentified which may represent some inoperculate discomycete. Fries (1874: 597) had not seen any specimen when he referred it to *Solenia*: “Non vidi, sed *S. anomalae* ita affinis, ut de genere non dubitem.” I am not at all convinced that Fries was correct and consider the species as ‘lost’.

*antiquatus*. — *Peziza antiquata* Batsch, Elench. Fung. 119. 1783; Cont. 1: 203 pl. 27 f. 141. 1786 (devalidated name).

Fries (1822: 36) thought of *Thelephora* Ehrh. ex Fr. (original wide sense) in connection with this fungus, which has dropped out completely from literature. In shape it is ‘cyphelloid’, or, rather, *Cytidia*-like. I have compared Batsch’s account carefully with *Cytidia salicina* (Fr.) Burt, dried *Exidia recisa* (Ditm. per S. F. Gray) Fr., and forms of some species of *Stereum* Pers. per S. F. Gray, but could not decide on any of these, although the fungus may well be hymenomycetous. Another ‘lost’ species.

*applicatus*. — *Merulius applicatus* Lév. in Ann. Sci. nat. (Bot.) II 19: 214 pl. 7 f. 2. 1843. — *Cantharellus applicatus* (Lév.) Fr., Hym. europ. 461. 1874. — *Dictyolus applicatus* (Lév.) Quéll., Ench. Fung. 140. 1886.

A ‘lost’ species that may belong to the agarics; compare *Schizophyllum commune* Fr. per Fr. (the substratum being rotting leather).

*axillaris*. — *Peziza axillaris* C. Nees, Syst. Pilze 258 pl. 37 f. 267. 1816 & Ueberbl. 67. 1817 (devalidated name). — *Peziza axillaris* C. Nees per Pers., Mycol. europ. 1: 314. 1822. — *Humarina axillaris* (C. Nees per Pers.) Seav., N. Amer. Cup-fungi (Op.) 124. 1928.

Sprengel (1827: 511) listed *Peziza axillaris* as a possible synonym (variety) of *Cyphella muscicola* Fr. The original fungus is apparently a discomycete. Some authors admit it as a good species (cf. Seaver, l.c.), but Dennis (1956: 114), after a discussion, concludes that it is still doubtful.

*australis*. — *Cyphella australis* Speg. in Ann. Soc. cient. argentina 12: 29. 1881. — *Chaetocypha australis* (Speg.) O.K., Rev. Gen. Pl. 2: 847. 1891.

From the description [“pileo . . . extus (sub lente tantum) minutissime pruinuloso, cinereo v. cinereo-glaucosus”], this might be a species of *Favolaschia* (see p. 42), like *F. saccharina* Pat. Although there is no explicit statement about the cup being ‘compound’, the words “sparsa v. hinc inde 2–5 gregaria” perhaps mean that fruit-bodies with 2–5 tubes were present.

*boninensis*. — *Dictyolus boninensis* S. Ito & Imai in Trans. Sapporo nat. Hist. Soc. 16: 20. 1939.

Singer (1945: 191) thinks that it seems to belong to the group of *Campanella caerulescens* (Berk. & C.) Sing. A lamellate species and presumably agaric.

*campanula*. — *Peziza campanula* C. Nees is cited by Fries (1874: 665) as a synonym of *Cyphella sulphurea* (Batsch) per Fr., which, if correct, would make it an inoperculate discomycete (*Belonioscypha* Rehm). However, Fries certainly misinterpreted *Peziza sulphurea* Batsch (see p. 63), and it is likely that the species he had in mind, as well as the original *P. campanula*, belongs to *Calyptella*. This question will be discussed at greater length on a future occasion.

*cervinus*. — *Peziza cervina* Pers., Syn. Fung. 647. 1801 (devalidated name); not *P. cervina* Pers., Mycol. europ. 1: 254. 1822; not *P. cervina* (Fuck.) Sacc., Syll. Fung. 8: 84. 1889.

Persoon (1822: 280) cited this name as a possible synonym of *Peziza digitalis* A. & S. According to Fries (1822: 187) it belongs to *Cenangium ferrugineum* Fr. per Fr., an inoperculate discomycete which Rehm (1889: 227) calls *Cenangium abietis* (Pers.) Rehm = *C. abietis* (Pers.) per Duby.

*chrysophaeus*. — *Peziza chrysophaea* Pers., Syn. Fung. 674. 1801; Ic. pict. 17 pl. 8 fs. 1, 2. 1804. — *Stictis chrysophaea* (Pers.) per Pers., Mycol. europ. 1: 335. 1822; Fr., Syst. mycol. 2: 194. 1822. — *Ocellaria chrysophaea* (Pers. per Pers.) Quél., Ench. Fung. 332. 1886; Rehm in Rab., Krypt.-Fl., Pilze 3: 135. 1888.

Secretan (1833: 303) listed this as a possible synonym of *Peziza amorpha* Pers. = *Aleurodiscus amorphus* (Pers. per Purt.) J. Schroet. This is incorrect; *Peziza chrysophaea* is more likely to be a discomycete: compare Rehm (l.c.)

*cinereofuscus*. — *Peziza cinereofusca* Schw. in Schr. naturf. Ges. Leipz. 1: 119. 1822; Fr., Syst. mycol. 2: 97. 1822. — *Cyphella cinereofusca* (Schw.: Fr.) Sacc. in Michelia 2: 303. 1881; Sacc. & Roum. in Roum., Fungi gall. exs. No. 1504. 1881; Roum. in Rev. mycol. 3/No. 12: 5. 1881. — *Velutaria cinereofusca* (Schw.: Fr.) Bres. (“in litt.”) apud Rehm in Rab., Krypt.-Fl., Pilze 3: 645. 1892. — *Calyptella cinereofusca* (Schw.: Fr.) Big. & Guill., Fl. Champ. France, Compl. 482. 1913.

Two quite different fungi have been associated with this name. Saccardo identified it for some time with a species of the ‘Cyphellaceae’ that will be discussed on a later occasion. Seaver (1951: 275) agrees, stating: “It is a *Cyphella*.” This interpretation is here rejected and von Schweinitz’s species excluded from the Basidiomycetes.



Bresadola and Rehm referred it to the inoperculate discomycetes and Rehm (l.c.) gives what appears to be a good description of Bresadola's interpretation.

*confusus*. — *Porothelium confusum* Berk. & Br. in Ann. Mag. nat. Hist. V 1: 24. 1878.

Fide Rea (1922: 703) and Reid (1957: 134) = *Odontia sudans* (A. & S. per Fr.) Bres. = *Dacryobolus sudans* (A. & S. per Fr.) Fr. For a note on *Dacryobolus*, see page 41.

*convolutus*. — *Cyphella convoluta* Cooke in Ann. New York Acad. Sci. 1: 179. 1878.

Apparently not a basidiomycete: Burt (1914: 380) reports that "the 'basidia' are filiform and only 1-spored."

*cookei*. — For *Cyphella cookei* Sacc. & P. Syd., see *Cyphella fili(c)icola* Cooke.

*crucibulum*. — *Merulius crucibulum* Fr., Obs. mycol. 1: 99. 1815 (devalidated name). — *Xylomyzon solare* var. *crucibulum* (Fr.) per Pers., Mycol. europ. 2: 29. 1825. — *Cantharellus crucibulum* (Fr. per Pers.) Fr., Epicr. 369. 1838. — *Leptotus crucibulum* (Fr. per Pers.) P. Karst. in Bidr. Känn. Finl. Nat. Folk 32: 243. 1879. — *Dictyolus crucibulum* (Fr. per Pers.) Quéll., Ench. Fung. 142. 1886.

Another 'lost' species. There is no reason for dragging the name along in connection with *Leptotus* or any other group of 'Cyphellaceae'. It is here suggested that it may be a synonym of *Paxillus panuoides* (Fr. per Fr.) Fr., and more particularly, a name given to one of those poorly developed forms occurring in cellars and mines. Pilát (1948a: 18) cites a specimen (PR) named "*Agaricus crucibulum* Corda" as a synonym of "*Crepidotus*" *panuoides* (Fr. per Fr.) Pilát. It would seem that Fries himself (1863: 212) thought of that species when he wrote about *Cantharellus crucibulum*, "... caute distinguendus a *Paxillo panuoides*." From the same account it also appears that it was found in "locis suffocatis".

*cruentus*. — *Thelephora cruenta* Pers., Syn. Fung. 575. 1801 (devalidated name). — *Thelephora cruenta* Pers. per Fr., Syst. mycol. 1: 444. 1821, misapplied. — *Corticium cruentum* (Pers. per Fr.) J. Schroet. in Krypt.-Fl. Schles. 3 (1): 423. 1888, misapplied. — *Lomatina cruenta* (Pers. per Fr.) P. Karst., Finl. Basidsv. 156. 1899, misapplied. — *Cytidia cruenta* (Pers. per Fr.) Herter in KryptFl. Brandenb. 6: 83. 1910, misapplied.

*Thelephora cruenta* var. *sanguinea* A. & S., Consp. Fung. nisk. 277. 1805, misapplied, ≡ *Thelephora cruenta* Pers. (basinym).

Type.—L 910.267-694.

Persoon's description of *Thelephora cruenta* Pers. is very short. This is apparently why the name has been misapplied. The description ("glabra coriacea tuberculata, sanguinea-rubra. Ad cortices arborum . . .") suggests *Hymenochaete mougeotii* (Fr.) Cooke, and material in Persoon's herbarium is in agreement with such a determination. According to the "Synopsis Fungorum" the type (L 910.267-694) was sent

to Persoon by Ludwig. It is labelled in Persoon's handwriting "*Thelephora cruenta* | — *punicea*." The second name was evidently added on a later occasion. The collection is a good specimen of *Hymenochaete mougeotii*. A second specimen (L 910.277-344) represents the same species. It is labelled, "*Thelephora* / in cortice emortuo *Pini abietis*" in Mougeot's handwriting. Persoon wrote "*cruenta*" after '*Thelephora*'. Lloyd marked this sheet as "type", which is erroneous because the type came from Germany and was sent by Ludwig, before Mougeot started to send specimens to Persoon from the Vosges. A third specimen (L 910.277-341) is labelled by Chaillat, "*Thelephora cruenta* Pers.? Elle me paroit différer par l'absence des Papilles. du reste elle me paroit entièrement semblable. . . . 1818 No. 46." Persoon added "*T. punicea* Alb. et Schwein." The specimen is again *Hymenochaete mougeotii*. It is thus well established (i) what species Persoon described as *Thelephora cruenta*, and (ii) that afterwards he thought that he recognized. *T. punicea* A. & S. in his species.

The first authors who erroneously interpreted Persoon's species (which they called *Thelephora cruenta* var. *sanguinea*) were von Albertini & von Schweinitz. Their description and indication of habitat leave not the slightest doubt that they were dealing with the species Fries would later call *Thelephora salicina* Fr. They added a second variety (which is why they also gave the typical fungus a varietal name), viz. *T. cruenta* var. *roseo-rubra* A. & S.; it is not easy to determine with certainty and may be left out of further account.

When Fries re-published *Thelephora cruenta* in the starting-point book he, too, misapplied it. When he became aware of his error he renamed his interpretation *Thelephora sarcoides* Fr. This species will be separately discussed below. At the same time Fries (1828: 188) refused to take up Persoon's name for the correct species, which he renamed *Thelephora mougeotii*, dropping the name *T. cruenta* altogether. This was when he had seen Persoon's species as distributed by Mougeot & Nestler, *Stirpes Crypt. vogeso-rhenanae*, Fasc. 6: No. 581. 1818, the label of which runs: "581. *Thelephora cruenta* Pers. Syn. Fung. p. 575. Ad ramos exsiccatos *Pini Piceae*. Autumnno." We have seen above that Persoon had so named a specimen he had received from Mougeot. Fries explained his reluctance to accept the name *T. cruenta* thus:

"Color in meis speciminibus [Moug. et Nestl.! exs. n. 581.] haud cruentus. — Quid *Th. cruenta* Pers., Syn. p. 575. monentibus A. S., e tribus verbis vix dijudicandum. Ipsi huc retulerunt *Th. salicinam* et *T. sarcoidem*. Alia vidi specimina hujus nominis, quae *Phlebiam* spectant. Cel. Sprengel, qui forsan a Ludwigio habuit, ad *Th. polygoniam* refert. Ipse ducibus A. S. in S[yst]. M[ycol]. *Th. sarcoidem* pro *T. cruenta* habui. Cel. Mougeot dedit praesentum, cujus specimina divulgata omnem confusionem tollant, quare nomen hujus merito ferat species nitidissima! *Th. cruentae* nomen prorsus negligendum. In *Myc. Eur.* tres diversissimas species complectitur."<sup>12</sup>—Fries (1828: 188).

<sup>12</sup> In later work Persoon (1822: 140) not only combined his own species with the one described by von Albertini & von Schweinitz, but he also admitted as a variety *T. cruenta* var. *roseorubra* A. & S., which Fries referred to *T. sarcoides* Fr.

*Thelephora cruenta* has been taken up again in von Albertini & von Schweinitz's sense by Schroeter, Karsten, Herter, and other authors. It will be clear from what has been said that this misinterpretation should be discontinued, and that *T. cruenta* should be removed from the genus *Cytidia*.

Since Fries did not exclude the original fungus from his treatment of *Thelephora cruenta* in the starting-point book, the name should be applied in its original sense; hence the following recombination, which now appears to be the correct name for *Hymenochaete mougeotii*: **Hymenochaete cruenta** (Pers. per Fr.) Donk, *comb. nov.* (basinym, *Thelephora cruenta* Pers., Syn. Fung. 575. 1801 per Fr., Syst. mycol. 1: 444. 1821).

A question that arises in this connection is what *Thelephora punicea* A. & S. really represents. The current interpretation identifies it with a species of *Tomentella* Pat., now called *T. punicea* (A. & S. per Fr.) J. Schroet. (for a description, see Bourdot & Galzin, 1928: 491). This can hardly be correct for the original description (von Albertini & von Schweinitz, 1805: 278) contains, *inter alia*, "Membrana circumscripta, diametro 1½–3 unc. fere aequans, appressa vel subreflexa . . .", which excludes any known red species of *Tomentella*! The substratum is given as ". . . ad cortices fagineos . . . et abietinos", and, if correct, would exclude *Hymenochaete cruenta*, or point to a mixture of species, since *H. cruenta* does not occur on beech. If one narrows the original concept to the fungus on the coniferous substratum, *Thelephora punicea* may perhaps be listed as a synonym of *Hymenochaete cruenta*.

*cupressi*. — *Merulius cupressi* Schw. in Schr. naturf. Ges. Leipz. 1: 92. 1822. — *Cyphella cupressi* (Schw.) Fr., Elench. 2: 29. 1828.

This is a gall: compare Berkeley & Curtis (1856: 207); Burt (1914: 380), and Lloyd (1911: 497 f. 385).

*cupularis*. — *Merulius cupularis* Wahlenb., Fl. lapp. 529 pl. 30 f. 6. 1812 (devalidated name). — *Cantharellus cupularis* (Wahlenb.) per Fr., Syst. mycol. 1: 325. 1821. — *Merulius cupularis* (Wahlenb. per Fr.) Pers., Mycol. europ. 2: 25. 1825. — *Arrhenia cupularis* (Wahlenb. per Fr.) Fr., Summa Veg. Scand. 2: 312. 1849; Strauss in Sturm, Deutschl. Fl., Pilze Hft. 33–34: 9 pl. 5. 1853. — *Dictyolus cupularis* (Wahlenb. per Fr.) Pat., Essai taxon. Hym. 131. 1900.

This species was redescribed once after 1821, by von Strauss (l.c.). The original description reads like that of one of the minute species of *Resupinatus* (C. Nees) per S. F. Gray, and Fries seems to have thought of that, too: "Ex Wahlenbergii exemplaribus pro juniore statu *A[garici] applicati* facile haberem, sed *Straussii* vere distincta." Still later he is even more positive (Fries, 1863: 212): ". . . at examinatis archetypis auctoris meram *A. applicati* formam juvenilem censeo." *Pleurotus kavinii* Pilát is one of the forms around *Resupinatus applicatus* (Batsch per Fr.) S. F. Gray that has few (5–8), rather low gills and that reminds one of *Merulius cupularis* in sufficient respects to suggest that Wahlenberg's species might well be a member of *Resupinatus*.

*cyphelloides*. — *Laschia cyphelloides* J. Rick (in herb.); Lloyd, Mycol. Notes 5: 802, 1918 (as a synonym). — *Rimbachia cyphelloides* (J. Rick) ex Lloyd, Mycol. Writ. 5: 802 fs. 1245, 1246. 1918. — *Arrhenia cyphelloides* (J. Rick ex Lloyd) Sing. apud Dennis in Kew Bull. 1952: 327 (as a synonym).

See under *Arrhenia flabellula* (Berk. & C. ex Cooke) Dennis.

*discoideus*. — *Cyphella discoidea* Cooke in Grevillea 12: 85. 1884.

Cunningham (1953a: 281; 1953b: 187) reports that examination of the type showed it to consist of empty egg-cases of a spider.

Type.—New Zealand, Napier (W. Colenso 630, K)!

*dryophilus*. — *Peziza dryophila* Pers., Mycol. europ. 1: 265. 1822.

Fide Fries (1822: 105), a form of *Peziza punctiformis* Fr. = *Cyphella punctiformis* (Fr.) P. Karst. Later authors have not upheld this disposition and Rehm (1893: 900) cites Persoon's fungus as belonging to the inoperculate discomycete *Lachnum fuscescens* (Pers. per Fr.) P. Karst. = *Dasyscypha fuscescens* (Pers. per Fr.) Rehm.

*filicicola*. — See *filicola*.

*filicola*. — *Cyphella filicola* Cooke in Grevillea 14: 129. 1886; Sacc. & P. Syd. in Sacc., Syll. Fung. 14: 231. 1899 (“*filicicola*”); not *C. filicicola* Berk. & C. apud Berk. in Grevillea 2: 5. 1873. — *Cyphella pteridophila* Sacc., Syll. Fung. 6: 683. 1888 (“Cooke”); Lloyd, Mycol. Writ. 6: 975. 1920 (“*pteridophyta*”). *Cyphella cookei* Sacc. & P. Syd. in Sacc., Syll. Fung. 14: 231. 1889.

Fide Cunningham (1953a: 282; 1953b: 188) the type consists of empty egg-cases of “some moth or butterfly”.

*fimicola*. — *Arrhenia fimicola* Baglietto in Comm. Soc. critt. ital. 2: 264. 1865 (n.v.); Fr., Hym. europ. 462. 1874.

The following note shows that this is another species to be excluded from the basidiomycetes:

“*Arrhenia fimicola* Bagl. / Sul fimo pecorina (non porcino) nei pascoli piu elevati presso i ghiacciai del Monte Rosa. Agosto 1886 ([Caresti] n. 1181). / Questa pretesa specie non è che una *Peziza*, in cui l'imenio è stato di distrutto. Dalle setole marginali potrebbe forse riferirsi alle *Lachnea theleboloides* Alb. et Schw. Gli esemplari esaminati sono, a detta di Carestia, identici a quelli spediti al Baglietto, cha furono raccolti nelle medesime localita e sul fimo ovino e non porcino, come indica Fries negli Hym. Europ. p. 462.”—Bresadola & Saccardo (1897: 245-246).

*flabellulum*. — *Favolus flabellulum* Berk. & C. (“in Herb.”); Cooke in Grevillea 19: 105. 1891 (as a synonym). — *Laschia flabellula* (Berk. & C.) ex Cooke in Grevillea 19: 105. 1891. — *Arrhenia flabellula* (Berk. & C. ex Cooke) Dennis in Kew Bull. 1952: 327 f. 2.

Redescribed by Dennis (l.c.) who also reports, that according to Singer “*Arrhenia cyphelloides* Lloyd” = *Rimbachia cyphelloides* (J. Rick) ex Lloyd is a synonym. This species hardly fits in *Arrhenia* (see p. 27); it seems better placed in *Campanella*

P. Henn. (cf. p. 40) on account, for instance, of its substratum (on logs) and gelatinous consistency.

*flocculentus*.

*Thelephora populina* Fr., Elench. 1: 184. 1828 ("ined,"; as a synonym); not *Thelephora populina* Sommerf., Suppl. Fl. lapp. Wahlenb. 284. 1826. — Herbarium name for *Thelephora flocculenta* Fr.

*Thelephora flocculenta* Fr., Elench. 1: 184. 1828, in part. — *Corticium flocculentum* Fr., Epicr. 559. 1838. — *Terana flocculenta* (Fr.) O.K., Rev. Gen. Pl. 2: 872. 1891. — *Auricularia flocculenta* (Fr.) P. Henn. in Verh. bot. Ver. Brandenb. 37: 5. 1896 (nomen provisorium), misapplied. — *Cyphella flocculenta* (Fr.) Bres. in Ann. mycol., Berl. 1: 111. 1903, misapplied. — *Cytidia flocculenta* (Fr.) Höhn. & L. in S.B. Akad. Wien (Math.-nat. Kl., Abt. I) 116: 758. 1907, misapplied. — *Auriculariopsis flocculenta* (Fr.) Sacc. & Trott. in Sacc., Syll. Fung. 21: 423. 1912, misapplied.

Type.—Sweden, Femsjö (hb. Fr.-UPS).

As to the identity of this fungus I have come to the conclusion that it is not the one currently connected with the name *Cytidia flocculenta*, but that it is a synonym of *Corticium evolvens* (Fr. per Fr.) Fr. = *C. laeve* (Pers. per Fr.) Fr. The following lines will show some of the reasons for this conclusion.

*Cyphella ampla*, with which *Corticium flocculentum* has been identified by J. Schroeter and many later authors, is exceedingly rare in Sweden, if it occurs in that country at all: I do not remember coming across even a single specimen collected in Sweden in the herbarium at Uppsala.

Moreover, a specimen is available that appears entitled to be regarded as type; it is labelled in Fries's handwriting, "*Corticium flocculentum* Fr. / Femsjö / *Rudera misera*." The fungus has completely disappeared from the substratum except for some tiny tissue fragments at one or two points of attachment of fruit-bodies. One of these fragments yielded hyphae of *Corticium evolvens*. Dr. J. Eriksson, to whom I showed the slide, agrees with this determination.

Fries's rather elaborate account, as well as the species with which he compared *Thelephora flocculenta*, also points in the direction of *Corticium evolvens*, and definitely not to *Cyphella ampla*. The one discrepancy may be the alleged colour of the fresh fruit-body, "... hymenio ... sanguinorufo e pruina cervino ... hymenio ... intense sanguineo, sed hic color tantum in humectata apparet; siccum enim, hymenium laeve subcervinum! ... Hymenium ... demum ... colore cinereo-cervino memorabile." Yet, I think it justified to accept *Thelephora flocculenta* as one of the several names under which Fries described *Corticium evolvens*. In any case there is no reason to retain the name for *Auriculariopsis ampla*.

I have thought of the possibility that *Thelephora flocculenta* might be *Cytidia salicina* (Fr.) Burt. The latter fungus has been found on rare occasions on species of *Populus*, and "Ad truncus *Populi*" is the substratum indicated for *T. flocculenta*. However, the microscopical details of the hyphae from the type preclude the possibility of this synonymy.

*flos-albus*. — *Cyphella flos-albus* Velen., České Houby 767 f. 136: 10. 1922 (“*flos albus*”; for Latin translation, see Pilát, Velen. Sp. nov. Basid. 280. 1948); Pilát in Ann. mycol., Berl. 22: 206 pl. 1 f. 10. 1924.

The distinguishing features are in the thin, slender stalk, which is made villose from long patent hairs and which expands abruptly into the completely naked cup. Collected on rotten roots in a hollow trunk.

The striking difference in villosity between the stalk and the cup suggests that, contrary to the usual situation in the ‘Cyphellaceae’, the naked surface of the cup is of a radically different nature from that of the stalk, and this, in my opinion, indicates that the outer surface of the cup is covered by the hymenium. This assumption makes of *Cyphella flos-albus* an agaric species with upturned cap and smooth hymenophore at the nether (= outer) surface, comparable to—if not identical—with *Peziza gibba* A. & S., a species of *Mycena sensu lato*, which is discussed below.

*foliicola*. — *Cyphella foliicola* Vainio in Ann. Sci. fenn. A 15 (6): 83. 1921. — *Chlorocyphella foliicola* (Vainio) Keissl. in Ann. naturh. Mus., Wien 41: 159. 1927. — *Pyrenotrichum foliicola* (Vainio) R. Sant. in Symb. bot. upsal. 12 (1): 41. 1952.

See under *Chlorocyphella* (p. 40).

*friesii*. — *Porotheleum friesii* Mont. in Ann. Sci. nat. (Bot.) II 5: 339. 1836; Fr., Epicr. 504. 1838. — *Porotheleum fimbriatum* var. *friesii* (Mont.) QuéL., Fl. mycol. France 428. 1888.

If not considered a distinct species of *Porotheleum*, then it has often been included (recently, for instance, by W. B. Cooke, 1957: 684) in *Porotheleum fimbriatum* (Pers. per Fr.) Fr. = *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk. Lloyd (1917: 740) took it to be based on the young, papillate condition. The original description does not support such a disposition and a portion of the type (K) shows this to be a resupinate species of Corticiaceae to which I intend to return on a future occasion.

*fulvus*. — *Porotheleum fulvum* Ell. & Ev. apud Langl., Cat. Fl. Basse-Louisiana 33. 1887 (nomen nudum; n.v.).

Fide Lentz (apud Cash, 1953: 327) = *Hypocrea citrina* (Pers. per Fr.) Fr.

*gibbus*. — *Helotium gibbum* A. & S., Consp. Fung. nisk. 350 pl. 4 f. 1. 1805 (devalidated name). — *Perona gibba* (A. & S.) per Pers., Mycol. europ. 2: 3. 1825. — *Helotium gibbum* (A. & S. per Pers.) Fr., Syst. mycol. 3 (Ind.): 94. 1832. — *Omphalia gibba* (A. & S. per Pers.) Pat., Tab. anal. Fung. 2: 26. 1887 (legend to f. 560 reads, “*Ag[aricus] (Omphalia) gibba* (A. et Sch.) Pat.”). — *Agaricus gibbus* (A. & S. per Pers.) Pat., see preceding name. — *Cyphella gibba* (A. & S. per Pers.) J. Schroet. in Krypt.-Fl. Schles. 3 (1): 434. 1888. — *Phialea gibba* (A. & S. per Pers.) Sacc., Syll. Fung. 8: 271. 1889. — *Delicatula gibba* (A. & S. per Pers.) Pat., Essai taxon. Hym. 157. 1900. — *Cyphella indundibuliformis* Fr., Summa Veg. Scand. 2: 336. 1849. — *Chaetocypha infundibuliformis* (Fr.) O.K., Rev. Gen. Pl. 2: 847. 1891. —

"*H[elotium] umbonatum* A. S.": Fr., *Summ. Veg. Scand.* 2: 354. 1849 (error; as a synonym).

Descriptions & illustrations.—Patouillard, 1887, l.c.; Cejp in *Atl. Champ. Eur.* 4: 144 pl. 54 fs. 9–11. 1938 (*Delicatula*).<sup>13</sup>

This fungus has been a puzzle since its publication, and it is often referred to the discomycetes as an insufficiently known species. Schroeter (l.c.) placed it in *Cyphella*, but apparently did so only by judging from the original account.

Patouillard's interpretation of the species as an agaric is doubtless correct, although the fungus he described may possibly be a closely related species, rather than the same one; the original account is sufficiently detailed and clear for us to accept Patouillard's fungus as conspecific. The 'cup' is the cap of an agaric, with smooth hymenophore covering the outside of the cup; the nipple at the bottom of the cup is the umbo on the cap, which turns inside out early in development.

*Mycena crispula* (Quél.) Kühner sensu Kühner (1938: 642 f. 230) and Kühner & Romagnesi (1953: 117 f. 61) agrees in several respects. It has often a very pronounced nipple-like umbo; the gills may be strongly reduced or often completely lacking, rendering the hymenophore smooth; the cup has a pronounced tendency to turn up when the fruit-body matures; and the stalk is patently villose. This species may serve for the present as the link which attaches *Peziza gibba* to the agarics. *Cyphella flos-albus* Velen., q.v., is apparently another species from this group, if not conspecific with *Peziza gibba*.

The correct position of species like *Mycena crispula* is not easy to determine. This is not the place to discuss extensively the generic position of such species, among which I would tentatively include *Peziza gibba*. Modern authors are far from unanimous on this point and place *Mycena crispula* in *Mycena* (A. H. Smith, 1947: 87), *Delicatula* Fayod (Kühner & Romagnesi, 1953: 117), *Marasmiellus* Murrill<sup>14</sup>, and *Omphalia* (Fr.) Kummer = *Omphalina* Quél. (Josserand, 1937: 92). Wherever it

<sup>13</sup> What Rea (1927: 217) described under the name *Omphalia gibba* may not be the same species and appears more typically 'mycenoid': he describes the cap as plane with a gibbous centre and borrows the qualification... "villose and soon becoming depressed" from Patouillard.

<sup>14</sup> Singer (1951: 298) places *Mycena crispula* as *Marasmiellus crispulus* (Quél.) Sing. in *Marasmiellus* sect. *Candidi* (Kühner) Sing. subsect. *Hirsuti* (Kühner) Sing. (name not validly published). I would recognize a section here:

*Mycena* sect. **Hirsutae** (Kühner) ex Donk, *nov. sect.*

*Mycena* [subsect.] *Hirsutae* Kühner, *Genre Mycena* 638. 1938 (without Latin description). — *Marasmiellus* subsect. *Hirsuti* (Kühner) Sing. in *Lilloa* 22: 298. 1951 (without Latin description).

Affinis *Mycenae* sectioni *Candidae* Kühner, sed minuscula, pileo stipitique pilis distinctis longis patentibus dense villosa conspicua. Lamellae satis horizontales, saepe arcuato-concavae, deinde frequenter decurrentes, saepe angustae vel venas simulantes vel omnino absentes. Hymenium cystidiis destitutum.

Typus sectionis.—*Mycena mauretana* (Maire) Kühner.

Examples.—See Kühner, l.c. Additional species seem to be *Helotium hirsutum* Tode and *Peziza gibba* A. & S.

will go, it should be remembered that *Peziza gibba* may follow, and, if so, that the latter is the type of the earlier name *Perona* Pers. (1825).<sup>15</sup>

Quélet (1886: 216) listed *Cyphella abieticola* P. Karst. as a synonym of *Cyphella infundibuliformis*. This is evidently an error. Under *Peziza tubaeformis* Wallr. its author (Wallroth, 1833: 492) cited *Helotium gibbum* as a synonym (with a note of interrogation). The two fungi seem to be widely different; *P. tubaeformis* may belong to *Calyptrella*.

*glauca*. — For *Leptotus glaucus* (Batsch per Fr.) Maire, see under *Leptoglossum* (p. 42).

*heveae*. — *Cyphella heveae* Mass. in Kew. Bull. 1914: 157. — *Dasyscyphus heveae* (Mass.) Dennis & Reid in Kew. Bull. 1957: 287 f. 1.

The type appears to represent an inoperculate discomycete and Dennis & Reid (l.c.) have referred it to the genus *Dasyscyphus* S. F. Gray.

*hyalinus*. — *Peziza hyalina* Pers., Obs. mycol. 1: 28. 1796 (in obs. under *P. corticalis*); Syn. Fung. 655. 1801; (devalidated name). — *Peziza hyalina* Pers. per Pers., Mycol. europ. 1: 316. 1822; Fr., Syst. mycol. 2: 102. 1822. — *Hyaloscypha hyalina* (Pers. per Pers.) Boud., Disc. Europ. 127. 1907; Dennis, Rev. Brit. Hyalosc. (in Mycol. Pap. C.M.I. 32:) 70 f. 77. 1949.

This was listed as a synonym (variety) of *Peziza villosa* Pers. by Sprengel (1827: 505). For a description and discussion of this inoperculate discomycete, see Dennis (l.c.).

*hydnoideus*. — *Porothelium hydnoideum* Berk. in Grevillea 1: 70. 1872.

The description reads rather like one of *Odontia sudans* (A. & S. per Fr.) Bres. = *Dacryobolus sudans* (A. & S. per Fr.) Fr. See also discussion under *Dacryobolus* Fr. (p. 41).

*infundibuliformis*. — For *Cyphella infundibuliformis* Fr., see *Peziza gibba* A. & S.

*juranus*. — *Dictyolus juranus* Quél. & Pat. apud Quél. in C.R. Ass. franç. Av. Sci. 16: 589 pl. 21 f. 8. 1888. — *Cantharellus juranus* (Quél. & Pat. apud Quél.) Sacc., Syll. Fung. 9: 65. 1891. — *Leptoglossum juranum* (Quél. & Pat. apud Quél.) Kühner & Rom., Fl. anal. Champ. sup. 77. 1953 (incomplete reference).

<sup>15</sup> Donk (1949: 325–326) concluded that *Perona* Pers. was illegitimate in view of an earlier homonym, *Peronia* [Delar. in] Red. 1812, and, therefore, withdrew an earlier proposal to conserve *Omphalina* Quél. [the 'correct' name for *Omphalia* (Fr.) Kummer] against *Perona* Pers. However, Rogers (1950: 28–29) thinks that there is no question of homonymy in this case. In view of another remark by Rogers, it may be pointed out that *Peziza gibba* was included in *Omphalia* by Patouillard and that it falls within *Omphalina* Sect. *Integrellae* (Fr.) Quél. if that genus is used in the Friesian sense. The correct name for *Perona* Pers. now appears to be *Helotium* Tode per Fr., but as I will discuss in a forthcoming note, that name, as one given to a basidiomycetous genus, is better rejected in favour of the name of a discomycetous genus *Helotium*. This would bring *Perona* Pers. into prominence once more, if it is to be held legitimate.



Not known to modern authors. The original account calls to mind *Leptoglossum bryophilum* (Pers. per Fr.) Ricken as recently described by Kühner (*apud* Kühner & Romagnesi, 1954: 77 f. 1), but it differs in being smaller, in growing on rotten wood (instead of on living mosses), and in having, presumably, more constant and better developed gills. I would rather exclude it from the 'Cyphellaceae' as an agaric species.

*keithii*. — *Porotheleum keithii* Berk. & Br. in Ann. Mag. nat. Hist. V 1: 24. 1878.

This is in any case not a *Porotheleum* = *Stromatoscypha*. The very short description suggests some species of the Corticiaceae, perhaps a papillose form of *Corticium lividum* (Pers. per Fr.) Fr. = *Phlebia livida* (Pers. per Fr.) Bres.

*laxus*. — *Thelephora laxa* Pers., Mycol. europ. 1: 143. 1822.

Type.—L 910.267–613. Sent in by Mougeot as "*Thelephora* / Ecorce des Hêtres mors [!]" Persoon wrote on the label, "[*Thelephora*] *laxa* Myc. Europ. 1 p. 148 [= 193]. / *Th. evolvens* var.  $\delta$  Fries. Elench. fung. p. 182."

*Thelephora laxa* has been cited as a synonym of *Corticium amorphum* (Pers. per Purt.) Fr. = *Aleurodiscus amorphus* (Pers. per Purt.) J. Schroet. by Fries (1874: 648; with a point of interrogation) and Saccardo (1888: 606). The description suggests this species, but examination of the type leads to a different conclusion.

The original description (Persoon, 1822: 143) indicated the type locality as, "Hab. in summitatibus montium Vogesiorum." The specimen indicated above as type agrees very closely with the original description and was found by Mougeot, which means, in the Vosges. Looking at the specimen with a low-power lens, one can easily understand why Persoon stated, "Affinitatem habere videtur cum *Peziza amorphia*." However, microscopical examination showed it to belong to *Corticium evolvens* (Fr. per F.) Fr. = *C. laeve* (Pers. per Fr.) Fr. Bresadola (*apud* Saccardo & Bresadola, 1900: 427) had already come to that conclusion when he referred *Thelephora laxa* as "status juvenilis" to "*Corticium leve* Pers. non. Fr."

Another specimen (L 910.267–608) also sent in by Mougeot was annotated by Persoon himself as "[*Thelephora*] *laxa*? an fungus bene evolutus?" It shows *Peniophora polygonia* (Pers. per Fr.) Bourd. & G. = *Cryptochaete polygonia* (Pers. per Fr.) P. Karst. A third specimen (L 910.267–65) annotated in Persoon's handwriting, "Prope Párisios. / *Thelephora*? *laxa*" does not now yield anything he could have had in mind.

*lichenicola*. — *Cyphella lichenicola* Keissl. in Ann. naturh. Mus., Wien 41: 158. 1927 & *Chlorocyphella lichenicola* Keissl., op. cit. pp. 158, 159 (herbarium names listed as synonyms).

Keissler listed these names as synonyms of *Chlorocyphella aeruginascens* (P. Karst.) Keissl. See also under *Chlorocyphella* (p. 40).

*muscigenus*. — *Leptotus muscigenus* (Bull. per Fr.) Maire, *Arrhenia muscigena* (Bull. per Fr.) R. Heim, Champ. Europe 2: 113. 1957 (incomplete reference), not *Arrhenia muscigena* (Pers. per Mérat) Quéll., Fl. mycol. France 33. 1888.

For this species, see under *Leptoglossum* (p. 42).

*muscorum*. — *Merulius muscorum* Roth in Ann. Bot. (ed. Usteri) St. 1: 10 pl. 1 f. 4. 1791; Catal. bot. 1: 238. 1797; (devalidated name). — *Cantharellus muscorum* (Roth) per Fr., Syst. mycol. 1: 325. 1821. — *Merulius muscorum* (Roth per Fr.) Pers., Mycol. europ. 2: 24. 1825. — *Dictyolus muscorum* (Roth per Fr.) Quél., Ench. Fung. 140. 1886. — *Leptoglossum muscorum* (Roth per Fr.) Velen., České Houby 85. 1920; in Mykologia, Praha 2: 44 f. 3. 1925.

An imperfectly known species. The fungus that Sommerfelt named *Merulius muscorum* was referred to *Cyphella galeata* (Schum. per Fr.) Fr. by Fries (1838: 568). Velenovský's interpretation is not accessible to me because of the Czech description. The original fungus was described as "gelatinosus" and might be a discomycete; I am unable to make a more precise suggestion.

*nigrocaesius*. — *Peziza nigrocaesia* Schum., Enum. Pl. Saell. 2: 435. 1803 (devalidated name). — [*Peziza alboviolascens* var. "β. *P. nigro caesia*" (Schum.) Fr., Syst. mycol. 2: 96. 1822. —] *Peziza alboviolascens* var. *nigrocaesia* (Schum.) per Hornem. in Fl. dan. 12 / Fasc. 35: 8 pl. 2082 f. 2. 1832.

Fries (l.c.) referred this to *Peziza alboviolascens* A. & S. = *Lachnella alboviolascens* (A. & S. per Pers.) Fr., but neither Schumacher's original description nor his figure published much later by Hornemann support such a disposition. Evidently we are dealing here with some discomycete; the name has not been taken up or listed as a synonym in authoritative modern literature.

*papillaris*. — *Peziza papillaris* Bull., Herb. France pl. 467 f. 1. 1789; Hist. Champ. France 1: 244. 1791; (devalidated name). — *Peziza papillaris* Bull. per Mérat, Nouv. Fl. Paris, 2me Ed., 1: 22. 1821; S. F. Gray, Nat. Arr. Brit. Pl. 1: 666. 1821; Fr., Syst. mycol. 2: 102. 1822. — *Urceolella papillaris* (Bull. per Mérat: Fr.) Boud., Ic. mycol. 4: 310 & 3: pl. 529.

This was listed by Sprengel (1827: 505) as a synonym (variety) of *Peziza villosa* Pers. For a redescription of this inoperculate discomycete, see Boudier (l.c.).

*papillatus*. — *Porotheleum papillatum* Peck in Rep. New York St. Mus. nat. Hist. 40: 55. 1887 (n.v.).

Lloyd (1917: 740) attributed this to *Porotheleum fimbriatum* (Pers. per Fr.) Fr. = *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk as its young papillate condition (whatever that may mean). However, Peck's description (Saccardo, 1888: 422) contains, "... tenuissimum, ... subceraceum . . . , margine subindeterminato; verrucis minutis, subdistantibus, . . . globulo hyalino umbrino coronatis." Hence it would seem that this is again *Odontia sudans* (A. & S. per Fr.) Bres. = *Dacryobolus sudans* (A. & S. per Fr.) Fr., a species repeatedly confused with *Porotheleum*; see also discussion under *Dacryobolus* Fr. (p. 41). W. B. Cooke (1957: 684, 685) indicates that he saw the type and lists Peck's species under *Porotheleum fimbriatum* without explaining why such big discrepancies exist between the original description and the type material. As long as this has not been done, it would seem advisable again to dissociate *P. papillatum* from *P. fimbriatum*.

*patens*. — *Cyphella patens* A. L. Sm. in J. Linn. Soc., Lond. (Bot.) 35: 10 pl. 1 fs. 6–8. 1891.

There are gills present (“. . . lamellis paucis angustis lamelliformis instructis . . .”). The spores are given as ‘minute asperulis’. The fruit-body is spatulate and laterally produced from a stalk-like base. Apparently an agaric species, but I am unable to make a suggestion regarding the genus.

*pendulus*. — [*Peziza digitalis* A. & S. *sensu* Schw. in Schr. naturf. Ges. Leipz. 1: 118. 1822. —] *Peziza pendula* Schw. in Schr. naturf. Ges. Leipz. 1: 118. 1822 (nomen provisorium & alternativum); “Schwaegr. in litt.”, Fr., Syst. mycol. 2: 203. 1822 (as a synonym). — *Cyphella pendula* (Schwäger.) ex Fr., Syst. mycol. 2: 203. 1822. — *Polyporus pendulus* Fr., Nov. symb. 49 = in Nova Acta Soc. Sci. upsal. III 1: 65. 1851 (“mscr.”; as a synonym); Ellis in Amer. Nat. 18: 721. 1884. — *Porodisculus pendulus* (Fr.) Murrill in N. Amer. Fl. 9: 47. 1907.

Except for the ‘disc’, which may have been either destroyed or not attentively studied (“. . . discum profunde excavatum laevem pallentem cingens”), the original description gives a sufficiently clear picture of the species that has been called *Sphaeria pocula* Torrey ex Fr. = *Polyporus pocula* (Torrey ex Fr.) Berk. & C. and the correct name of which would appear to be *Porodisculus pendulus* (Fr.) Murrill (Polypora ceae).

*pteridophilus*. — For *Cyphella pteridophila* Sacc., see *Cyphella fili(ci)cola* Cooke.

*pteridophyta*. — See ‘pteridophilus’.

*pruinatus*. — *Peziza amorpha* var. (β.) *pruinata* A. & S., Consp. Fung. nisk. 329. 1805 (devalidated name).

Fries (1828: 184) thought this variety to be a form of *Thelephora flocculenta* Fr., which in my opinion (see above) is in its turn a mere form of *Corticium evolvens* (Fr. per F.) Fr. The original description is sufficiently detailed for us to reject this identification, but I am unable to suggest an alternative, although I would exclude it in any case from the ‘Cyphellaceae’ as currently understood.

*pulcher*. — *Cyphella pulchra* Berk. & Br. in J. Linn. Soc., Lond. (Bot.) 14: 74. 1873. — *Chaetocypha pulchra* (Berk. & Br.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Marasmius pulcher* (Berk. & Br.) Petch in Ann. R. bot. Gdns Peradeniya 9: 21. 1924.

Referred to, and redescribed as a species of, *Marasmius* Fr. by Dennis & Reid (1957: 290 fs. 4–6).

*pulveraceus*. — *Peziza pulveracea* A. & S., Consp. Fung. nisk. 342 pl. 8 f. 2. 1805 (devalidated name). — *Peziza pulveracea* A. & S. per Pers., Mycol. europ. 1: 267, 327. 1822; Schw. in Schr. naturf. Ges. Leipz. 1: 122. 1822. — *Cenangium pulveraceum* (A. & S. per Pers.) Fr., Syst. mycol. 2: 181. 1822. — *Cyphella pulveracea* (A. & S. per Pers.) Tul., Sel. Fung. Carp. 3: 207 (Ind.). 1865 (& cf. p. 173). — *Dasyscypha pulveracea* (A. & S. per Pers.: Fr.) Höhn. in S.B. Akad. Wien (Math.-nat.

Kl., Abt. I) 126: 339. 1917; Dennis, Rev. Brit. Hyalosc. (*in Mycol. Pap. C.M.I. 32:*) 57 f. 58. 1949.

This species was referred to *Cyphella* by the Tulasne brothers (op. cit., p. 173/159): “. . . *Peziza pulveracea* Alb. & Schw. . . . is by no means an ascomycete, but a hymenomycete and a true *Cyphella*, as we have determined after examining the specimens met with in the Ardennes by Montagne, and now contained in Desmazières' herbarium, and also the exactly similar specimens which the master of Lille himself published in his *Fl. Crypt. France*, ed. 1, fasc. XIII, 1833, no. 605 (under the name *Peziza*).”—Grove's translation.

However, modern mycology thinks that the original fungus is a discomycete most recently described by Dennis (l.c.). von Höhnelt (op. cit. p. 338) studied Desmazières' s distribution cited by the Tulasnes and found it to represent a discomycete which he identified with *Peziza pulveracea* A. & S.

*rickenii*. — *Leptotus rickenii* Sing. *in Lilloa* 22: 734. “1949” [1951] (nomen nudum). For this species, see under *Leptoglossum* (p. 42).

*roseoruber*. — *Thelephora cruenta* var. *roseorubra* A. & S., *Consp. Fung. nisk.* 277. 1805 (devalidated name). — *Thelephora cruenta* var. *roseorubra* A. & S. *per Pers.*, *Mycol. europ.* 1: 140. 1822.

See under ‘*sarcoides*’.

*rugosus*. — *Porothelium rugosum* Berk. *in Hook. J. Bot.* 8: 237 pl. 9 f. 2. 1856.

According to Lloyd (1917: 740) the species Berkeley described as “*Porothelium rugosum* and *Porothelium variabile* [originally described as *Polyporus variabilis* Berk.!] from Brazil are *Polyperus* with pustular pore mouths, closer to *Polyporus lucidus* than to *Porothelium*.” Similar or identical conclusions had previously been published. Patouillard (1894: 75) transferred both species to *Ganoderma* P. Karst. (giving *Porothelium rugosum* the new name *Ganoderma sprucei* Pat. because the combination *Ganoderma rugosum* already existed), while Wakefield (1934: 243) referred *Polyporus variabile* to *Amauroderma* Murrill. Recently W. B. Cooke (1957: 686) has retained *Porothelium rugosum* as a true *Porothelium* (subgen. *Porothelium!*); he indicates that he has seen [a portion of] the type and describes the spores as “hyaline to yellow, globose, apiculate, minutely verrucose, 7–10.5  $\mu$  diameter”, and the fructifications as “pileate, sessile, . . . surface with a crust . . .” If he had taken the trouble to look up the original publication, which he cites, he would have found the description and figure of a laterally stalked polypore with a stem as much as 6.5 cm long and a cap about 7.8 cm across. Hardly a typical *Stromatoscypha* one would conclude.

*rugulosus*. — *Phlebophora rugulosa* Lév. *apud Zoll.*, *Syst. Verz. ind. Archipel* 12, 17. 1854. — *Cyphella rugulosa* (Lév. *apud Zoll.*) Sacc., *Syll. Fung.* 6: 685. 1888. — *Van-Romburghia rugulosa* (Lév. *apud Zoll.*) Boedijn *in Sydowia* 5: 214. 1951.

A common species around Tjibodas and elsewhere in West Java (Indonesia) with centrally and ventrally stalked cap; it drifted into the genus *Cyphella* through

a complete misunderstanding of its characters. It belongs to *Van-Romburghia* Holterm., a remarkable agaric genus with smooth or somewhat veined hymenophore. For a description of the species, see Boedijn (l.c.).

*sanguineus*. — For *Thelephora cruenta* var. *sanguinea* A. & S., see under *Thelephora cruenta*.

*sarcoides*. — *Thelephora sarcoides* Fr., Elench. 1: 185. 1828. — *Corticium sarcoides* (Fr.) Fr., Epicr. 558. 1838. — *Terana sarcoides* (Fr.) O.K., Rev. Gen. Pl. 2: 872. 1891 (“*sarcodes*”). — *Lomatina sarcoides* (Fr.) Höhn. & L. in Ann. mycol., Berl. 4: 294. 1906. — *Cytidia sarcoides* (Fr.) Herter in Kryptfl. Brandenb. 6: 84. 1910; W. B. Cooke in Mycologia 43: 204. 1951, misapplied.

Misapplication.—*Thelephora cruenta* Pers. per Fr. *sensu* Fr., Syst. mycol. 1: 444. 1821.

Type.—Sweden, Femsjö (hb. Fr.-UPS).

*Corticium sarcoides* had dropped out of circulation when W. B. Cooke (1951: 204) revived it in an application for which he does not present any foundation. The elaborate original account points in the direction of *Corticium evolvens* (Fr. per Fr.) Fr. = *C. laeve* (Pers. per Fr.) Fr. In this connection attention may be drawn to Fries's closing remark, “Varietas tota effusa resupinata subimmarginata difficilium agnoscitur, sed certe huc pertinet.” In Uppsala there are two collections of which one (“*Corticium sarcoides* Fr. / Femsjö”) is considered type and one was communicated by Blytt; both were studied by Bresadola. According to Egeland (1912: 374) there are also a number of specimens in the herbarium at Oslo named *Corticium sarcoides* by Fries; ‘most of the specimens (if not all)’ belong to *Corticium evolvens*. This conclusion agrees with Bresadola's about the specimens at Uppsala. All in all there is sufficient evidence to dispose of *Corticium sarcoides* as a synonym of *Corticium evolvens*. It is in any case extremely improbable that it would be a species of *Cytidia* in the sense used by Cooke, or the species he describes under the name of *Cytidia sarcoides*.

Fide Fries (1828: 185) *Thelephora cruenta* var. *roseo-rubra* A. & S. (“var.  $\beta$ . A. S. p. 277.”) is *Thelephora sarcoides*; this may or may not be correct.

*stellatus*. — *Fimbrillaria stellata* Sow., Col. Figs Engl. Fungi pl. 387 f. 1. 1803 (devaluated name).

Fries (1838: 503) referred this fungus to *Porotheum fimbriatum* (Pers. per Fr.) Fr. = *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk, as a primordial, sterile state, that is, as a state in which the stroma has not yet developed any cups. No doubt Sowerby described some sterile mycelium, but hardly of the present species. I have never seen a specimen of *Stromatoscypha fimbriatum* of the size depicted by Sowerby that had remained completely devoid of cups.

*stevensoni*. — *Porotheum stevensoni* Berk. & Br. in Ann. Mag. nat. Hist. V. 1: 23. 1878; Stevenson, Brit. Fungi 2: 231 f. 71. 1886.

The original description and the more extensive account by Stevenson (l.c.)

apply well to *Odontia sudans* (A. & S. per Fr.) Bres. = *Dacryobolus sudans* (A. & S. per Fr.) Fr., and Lloyd (1917: 741), Wakefield (*apud* Rea, 1922: 645), and Reid (1957: 134) have referred this fungus to that species. See also under *Dacryobolus* Fr. (p. 41).

*subceraceus*. — *Cyphella subceracea* P. Henn. in *Hedwigia* 36: 194. 1897; Höhn. in *Denkschr. math.-nat. Kl. Akad. Wiss. Wien* 83: 6. 1907.

von Höhnel (l.c.) assumed that Hennings had described the spores erroneously as subglobose, 3–4  $\mu$  and he redescribed the species on examination of additional material. He concluded that the species evidently formed a link with "*Laschia*". A portion of the type collection (Ule 570, BRSL) which yielded no spores represents the genus *Favolaschia* (see p. 42). It seems to come close to (but is not identical with) *Favolaschia saccharina* Pat. and some other species, like *F. varariotecta* Sing. and *F. singeriana* Dennis (for descriptions, see Singer, 1945: 203, and Dennis, 1952: 328). The name ***Favolaschia subceracea*** (P. Henn.) Donk, *comb. nov.* is proposed. A few microscopical notes on the type follow:

Externally, the fruit-body bears two elements: (i) appressed, elongate, coloured bodies apparently the hardened, often broken, and corrugated contents of gloeocystidia, —250  $\times$  9.5–14  $\mu$ , which cause a minute, spaced striolation on the outside; and (ii) variable cells, ovoid, ellipsoid, pear-shaped, clavate, and the like, perpendicular to the surface, wholly covered by short, hair-like projections, about 12–46(–65)  $\times$  9–14  $\mu$ , and especially copious and crowded on young fruit-bodies.<sup>16</sup> Hymenium not yielding spore-producing basidia, containing gloeocystidia which are very variable in shape, enclosed or protruding, often present in large numbers. Spores not observed.

*subcyaneus*. — *Cyphella subcyanea* Ell. & Ev. in *J. Mycol.* 2: 37. 1886.

Farlow (*apud* Burt, 1914: 381) identified this with *Heterothecium augustinii* Tuckerm. (Lichenes). Fide Santesson (1952: 50, 537) = *Pyrenotrichum splitgerberi* Mont. See also under *Chlorocyphella* (p. 40).

*subtilis*. — *Boletus subtilis* Schrad., *Spic. Fl. germ.* 173 *pl.* 3 *f.* 2. 1794 (devalidated name). — *Polyporus subtilis* (Schrad.) Fr., *Obs. mycol.* 1: 129. 1815 (devalidated name). — *Polyporus* (*Porotheleum*) *subtilis* (Schrad.) per Fr., *Syst. mycol.* 1: 506. 1821. — *Porotheleum subtile* (Schrad. per Fr.) Fr., *Syst. mycol.* 3 (Ind.): 150. 1832; *Epicr.* 504. 1838. — *Poria subtilis* (Schrad. per Fr.) Bres. in *Atti Accad. Agiati* III 3: 88. 1897.

Fries (ll.cc.) referred this species to *Porotheleum*, but there is little in Schrader's original account to support this interpretation. Bresadola (l.c.) identified it with the species that is now often known as *Poria candidissima* (Schw.) Cooke = *Cristella candidissima* (Schw.) Donk *apud* W. B. Cooke, which is a far more likely disposition.

<sup>16</sup> Singer calls similar cells 'dendrophyses' (cf. 1945: *text-pl.* 3 *f.* 9) which is somewhat confusing.

*subtropicus*. — For *Chlorocyphella subtropica* Speg., see under *Chlorocyphella* Speg. (p. 40).

*sulphureus*. — *Peziza sulphurea* Batsch, El. Fung. 121. 1783; Cont. 1: 209 pl. 27 f. 146. 1786; (devalidated name); not *P. sulphurea* Pers. in Neues Mag. Bot. 1: 113. 1794 (= Tent. 33. 1797) (devalidated name) per S. F. Gray, Nat. Arr. Brit. Pl. 1: 665. 1821 & Fr., Syst. mycol. 2: 104. 1822. — *Cyphella sulphurea* (Batsch) per Fr., Hym. europ. 665. 1874. — *Chaetocypha sulphurea* (Batsch per Fr.) O.K., Rev. Gen. Pl. 2: 848. 1891 (“*sulfurea*”). — *Calypptella sulphurea* (Batsch per Fr.) Big. & Guill., Fl. Champ. France, Compl. 479. 1913 (“*sulfurea*”).

*Peziza sulphurea* Batsch was based on a single fruit-body depicted by its author. The figures, showing a disk-shaped (rather than a bell-shaped) cup on a relatively long stalk which becomes wider towards the cup, are reminiscent not of a species of *Calypptella*, but rather of some kind of discomycete. Dr. J. A. Nannfeldt kindly stated as his opinion (personal communication) that, “*Peziza sulphurea* Batsch (n. CXLVI) is clearly an inoperculate discomycete, perhaps *Helotium* ex aff. *herbarum* or *Belonioscypha Campanula*.”

When Fries (l.c.) restored Batsch’s name as *Cyphella sulphurea*, he used it as the correct name for what he had previously called *Peziza campanula* C. Nees, reducing the latter name to a synonym. Nees’s species has been variously interpreted, usually as a species of *Belonioscypha* Rehm, an inoperculate discomycete, but also as a species referable to *Calypptella*; see page 48. Later authors have applied the name *Cyphella sulphurea* to yellow forms of, or resembling, *Calypptella capula* (Holmskj. per Pers.) Quéf., thus to forms that more closely agree with Nees’s figure than with Batsch’s. The uses of Batsch’s name for them are evidently misapplications, and the various forms called *Cyphella sulphurea* will have to be treated in a different way. A discussion on this subject is reserved for a further occasion.

*tenellus*. — *Merulius tenellus* DC., Fl. franç. 2: 132. 1805 (devalidated name). — *Cantharellus tenellus* (DC.) per Fr., Syst. mycol. 1: 325. 1821. — *Merulius tenellus* (DC. per Fr.) Pers., Mycol. europ. 2: 25. 1825. — *Arrhenia tenella* (DC. per Fr.) Fr., Summa Veg. Scand. 2: 312. 1849. — *Leptotus tenellus* (DC. per Fr.) P. Karst. in Bidr. Känn. Finl. Nat. Folk 32: 242. 1879. — *Dictyolus tenellus* (DC. per Fr.) Pat., Essai taxon. Hym. 131. 1900.

This species has dropped out from modern floras and monographs. Several features indicated in the original description, like “. . . consistance . . . fragile, un peu gélatineuse; . . . couleur noire en dessus, et un peu moins obscure en dessous; . . . diamètre . . . d’un centimètre environ; . . . marqué en dessous de veins proéminentes inégales, qui rayonnent du centre . . . sur les vieilles planches pourries . . .”, strongly suggest some species of *Resupinatus* (C. Nees) per S. F. Gray, and I would exclude it from the ‘*Cyphellaceae*’ in any case as being evidently agaric. It would seem that Fries (1828: 56) reached a somewhat similar conclusion, “[*Cantharellus tenellus*] et *C. cupularis* sunt potius *Agarici macilenti*, ab *A[garico] striatulo* haud longe distantes.”

*tremulus*. — *Leptotus tremulus* (Schaeff. per Fr.) Sing. in *Lilloa* 22: 735. "1949" [1951]. For this species, see under *Leptoglossum* (p. 42).

*tunicatus*. — *Boletus tunicatus* Schum., Enum. Fl. Saell. 2: 391. 1803 (devalidated name).

This was incorrectly referred by Secretan (1833: 164) to *Polyporus fimbriatus supinus* Secr. = *Porotheleum fimbriatum* (Pers. per Fr.) Fr. = *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk. As far as can be judged from the too short original description this is a species of *Poria* Pers. per S. F. Gray *sensu lato*, but it is difficult to be more precise. Fries (1821: 381) referred the fungus to *Polyporus vulgaris*.

*umbonatus*. — For "*H[elotium] umbonatum* A. S.", see under *Peziza gibba* A. & S.

*urceolatus*. — *Peziza urceolata* Vahl in Fl. dan. 6 / Fasc. 17: 10 pl. 1017 f. 3. 1790 (devalidated name); not *P. urceolata* "Rutstr. diss. p. 19." (devalidated name). — *Peziza urceolata* Vahl per Pers., Mycol. europ. 1: 316. 1822; Schw. in Schr. naturf. Ges. Leipz. 1: 124. 1822; Fr., Syst. mycol. 2: 148, 201. 1822 (sp. inquir.). — *Solenia urceolata* (Vahl per Pers.) Wallr. apud Fr., Elench. 2: 28. 1828. — *Henningsomyces urceolatus* (Vahl per Pers.: Fr.) O.K., Rev. Gen. Pl. 3 (2): 483. 1898. — *Solenia poriaeformis* var. *urceolatus* (Vahl per Pers.: Fr.) Pilát in Ann. mycol., Berl. 23: 168 f. 19: 5-7. 1925. — *Cyphella urceolata* (Vahl per Pers.: Fr.) Bourd. & G., Hym. France 162. "1927" [1928].

The original description (accompanying a figure) merely runs, "sessilis, urceolata cinerea, extus pilosiuscula"; the habitat is stated to be "In segmentis ligneis, putridis." The whole account, inclusive of the figure, is in my opinion insufficient to settle the identity of the fungus that Vahl described.

As interpreted by Fries on examination of a (preserved) specimen received from Wallroth, the fungus would be a species congeneric with *Solenia poriaeformis* (Pers. per Mérat) Fuck., but differing, *inter alia*, in having its fruit-bodies scattered. Later Wallroth named his fungus *Peziza aleuritica* Wallr. Since I consider *Peziza urceolata* in its original sense as indeterminable, I will take up Wallroth's name for *Solenia urceolatus sensu Fries*.

*vallantii*. — *Boletus vallantii* DC., Fl. franç. 5: 38. 1815 (devalidated name). — *Polyporus vallantii* (DC.) per Fr., Syst. mycol. 1: 383. 1821. — *Poria vallantii* (DC. per Fr.) Cooke in Grevillea 14: 112. 1886. — *Porotheleum vallantii* (DC. per Fr.) Quél., Ench. Fung. 181. 1886.

The transfer of this species to *Porotheleum* by Quélet (l.c.) is certainly due to an erroneous conception either of the species or of the generic character of *Porotheleum* since the species is undoubtedly a resupinate polypore belonging to the artificial genus *Poria* Pers. per S. F. Gray *sensu lato*.

W. B. Cooke (1957: 684) still includes *Porotheleum vallantii* (DC. per Fr.) Quél. as a synonym of *Porotheleum fimbriatum* (Pers. per Fr.) Fr. = *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk. From Quélet's fuller description (1888: 427) I would conclude



that he was describing young fruit-bodies of *Poria vaillantii*: "Membraneux, ténu, translucide . . . et muni de cordonnets rhizomorphes très longs . . . Sur le bois, les briques, la terre." Quélet merely referred the fungus to the wrong genus when he placed it in *Porotheleum*.

*variabilis*. — For *Chaetocypha variabilis* Corda, see under *Chaetocypha* Corda (p. 40).

*variabilis*. — *Porotheleum variabile* (Berk.) Lloyd, Mycol. Notes 5: 740. 1917 (not definitely accepted by publishing author). For this species of polypores, see page 60.

*villosus*. — For *Trabecularia villosa* Bon., see under *Trabecularia* Bon. (p. 45).

#### 4.—THE ALEURODISCOID SPECIES

It is not my intention to discuss *Aleurodiscus* here from another point of view but its cyphelloid members; all resupinate species will be kept out of consideration. To limit the subject still more, attention will be paid only to the type species of *Aleurodiscus* and to those species that are not yet unanimously admitted to the genus.<sup>17</sup> The species I have in mind are:

- (i) *Cyphella digitalis* (A. & S.) per Fr., type species of the name *Cyphella*.
- (ii) *Cyphella vitellina* (Lév.) Pat., type species of the name *Gloeosoma*.
- (iii) *Cytidia hakgallae* (Berk. & Br.) G. W. Mart., type species of the name *Gloeo-cystis*; it is currently identified with *Cytidia cornea* Lloyd.
- (iv) *Cytidia magnispora* (Burt) Welden.

The main issue in connection with these species is, whether *Aleurodiscus* should be broadly conceived or be broken up into a long series of small genera. If one attributes generic significance to variations in shape and in consistency of the fruit-body, the number of genera could be much increased, and if one emphasizes, in addition, the various types of sterile hymenial elements, the multiplication of genera could be made really spectacular. It would seem that in delimitating *Aleurodiscus* other standards ought to be accepted than those employed elsewhere in the resupinate and cyphelloid groups. The solution of this problem cannot be given by taking into account only the above species: full consideration of the whole range of species of *Aleurodiscus* will be necessary, which leads to the confession that the generic limits of *Aleurodiscus* against several resupinate genera have not yet been sufficiently cleared. In short, the solution of the problem has to wait and in the meantime a simple disposition of the above mentioned cyphelloid species is wanted; this, in my opinion, means, inclusion in *Aleurodiscus*.

To me a corticioid or cyphelloid species of hymenomycetes that has enormous, globular spores, with amyloid walls is a good species of *Aleurodiscus*. This provides

<sup>17</sup> Two other species originally described as belonging to *Cyphella* but now referred to *Aleurodiscus* will be mentioned at the end of this chapter.

for the transfer of species (ii). The case of (i) and (iii) is less clear: they have the enormous spores and some other sporal characters required for a typical species of *Aleurodiscus*, but on the other hand the spore wall is not amyloid and, moreover, notable sterile elements between the basidia are absent in (i). Yet basidia and spores are so clearly 'aleurodiscoid' that I have decided to include them with the other species. It may be remembered that also among the non-cyphelloid species of *Aleurodiscus* one or two species with non-amyloid spores are included.

If one accepts the conclusion that the type species of *Cyphella* (*C. digitalis*) is so closely related to the type species of *Aleurodiscus* that they are congeneric, then it should be remembered that it has been decided to conserve *Aleurodiscus* against *Cyphella*.

#### ALEURODISCUS Rab. ex J. Schroet.<sup>18, 19</sup>

*Cyphella* Fr., Syst. mycol. 2: 201. 1822; Steud., Nomencl. bot. Pl. crypt. 142. 1824 ("Cypella"); nomen rejiciendum versus *Aleurodiscus* Rab. ex J. Schroet. — *Cyphella* sect. *Cyphella* (Fr.) Pat., Essai taxon. Hym. 56. 1900. — Lectotype (Code 1956: 209): *Cyphella digitalis* (A. & S.) per Fr. — Cf. Donk, 1951: 210.

*Nodularia* Peck in Rep. New York St. Mus. nat. Hist. 24: 96. 1872; not *Nodularia* Link ex Lyngbye (1819; Lemanaceae, Rhodophyceae); not *Nodularia* Mert. apud Jürg. ex Bornet & Flah. (1888; 'Nostocaceae Heterocystee', Cyanophyceae; nom. cons., see Code 1956: 199). — Monotype: *Nodularia balsamicola* Peck.

*Aleurodiscus* Rab., Fungi europ. exs. No. 1824 fig. 1874 & in Hedwigia 13: 184. 1874 (nomen nudum); Cooke in Grevillea 3: 136. 1875 (nomen nudum). — *Aleurodiscus* Rabenh. ex J. Schroet. in Krypt.-Fl. Schles. 3 (1): 429. 1888; nomen conservandum versus *Cyphella* Fr.<sup>18</sup>

*Matula* Mass. in J. R. microsc. Soc. II 8: 176. 1888 (nomen anamorphosis). — *Cytidia* sect. *Matula* (Mass.) W. B. Cooke in Mycologia 43: 208. 1951. — Monotype: "*Artocreas*" *poroniaeformis* Berk. & Br. [= imperfect state of *Aleurodiscus hakgallae* (Berk & Br.) Donk].

*Cypharium* Clem. in Univ. Stud. Nebraska 3 (1): 72. 1902 (nomen nudum) ≡ *Cyphella* Fr. *Gloeosoma* Bres. in Ann. mycol., Berl. 18: 51. 1920. — Monotype: *Aleurodiscus vitellinus* (Lév.) Pat.

*Aleurodiscus* subgen. *Pseudophysium* Pilát in Ann. mycol., Berl. 24: 207, 208. 1926. — Lectotype: *Aleurodiscus amorphus* (Pers. per Purt.: Fr.) J. Schroet.

*Aleurodiscus* sect. *Disciopsis* Pilát in Ann. mycol., Berl. 24: 211. 1926. — Monotype: *Aleurodiscus amorphus* (Pers. per Purt.: Fr.) J. Schroet.

*Cyphella* [sect.] *Coloratae* Killerm. in Nat. PflFam., 2. Ausg., 6: 150. 1928. — Lectotype: *Cyphella digitalis* (A. & S. per Pers.) Fr.

*Aleurodiscus* sect. *Eualeurodiscus* T. Ito in Bot. Mag., Tokyo 43: 460. 1929. — Lectotype: *Aleurodiscus amorphus* (Pers. per Purt.: Fr.) J. Schroet.

*Aleurocystis* [!] "McGinty": Lloyd, Mycol. Writ. 6: 1088. 1921 (nomen provisorium). — *Aleurocystis* Lloyd ex G. Cunn. in Trans. roy. Soc. New Zeal. 84: 234. 1956. — Monotype: [*Aleurodiscus capensis* Lloyd =] *Aleurodiscus corneus* (Lloyd) Lloyd.

<sup>18</sup> The Code (1956: 209) credits "Cooke, Grevillea 3: 136. 1875" with the valid publication of this name which is an error still to be corrected (cf. Donk, 1951: 206). Other uses of the generic name *Aleurodiscus* between Cooke's first use and Schroeter's are by Cooke (1875: 172) and Saccardo, Mycoth. veneta No. 727. 1876 (n.v.; cf. Saccardo, 1877: 101), in specific combinations, again without an accompanying generic description.

<sup>19</sup> The following synonymy is related only to the type and the cyphelloid species to be discussed below.

DESCRIPTION.—Patouillard, *Essai taxon. Hym.* 52. 1900.

LECTOTYPE (Code 1956: 209).—*Peziza amorpha* Pers. = *Thelephora amorpha* (Pers. per Purt.) Fr. — Cf. Donk, 1951: 206.

ALEURODISCUS AMORPHUS (Pers. per Purt.: Fr.) J. Schroet.

*Peziza amorpha* Pers., *Syn. Fung.* 657. 1801 (devalidated name). — *Peziza amorpha* Pers. per Purt., *App. Midl. Fl.* 265. 1821; Pers., *Mycol. europ.* 1: 269. 1822. — *Thelephora amorpha* (Pers. per Purt.) Fr., *Elench.* 1: 183. 1828. — *Corticium amorphum* (Pers. per Purt.: Fr.) Fr., *Epicr.* 559. 1838. — *Aleurodiscus amorphus* (Pers. per Purt.: Fr.) Rab., *Fungi europ. exs. No.* 1824 & in *Hedwigia* 13: 184. 1874 (generic name not validly published). — *Lachnea amorpha* (Pers. per Purt.: Fr.) Gillet, *Champ. France, Disc.* 89. 1881. — *Aleurodiscus amorphus* (̄ers. per Purt.: Fr.) J. Schroet. in *Krypt.-Fl. Schles.* 3 (1): 429. 1888.

*Nodularia balsamicola* Peck in *Rep. New York St. Mus. nat. Hist.* 24: 96 *pl. 4 fs. 23-26.* 1872. — Monotype: U.S.A., New York, Indian Lake (Peck; NYS, NY). — Fide Höhn. & Litsch. in *S.B. Akad. Wien (Math.-nat. Kl., Abt. I)* 116: 799. 1907 & Burt in *Ann. Missouri bot. Gdn* 5: 180. 1918 = *Aleurodiscus amorphus*.

[*Corticium amorphum* (Pers. per Purt.: Fr.) Fr. *sensu* Richon in *Bull. Soc. bot. France* 24: 148-149 *fs. 1-6.* 1877. —] *Corticium amorphum* f. *pezizoides* Roum., *Fungi sel. exs. No.* 4604. 1888 & in *Rev. mycol.* 10: 185. 1888. — Type locality: presumably France; type: specimen described by Richon, l.c.

*Aleurodiscus grantii* Lloyd, *Mycol. Writ.* 6: 927 *pl. 147 fs. 1668, 1669.* 1920. — Lectotype (Stevenson & Cash in *Bull. Lloyd Libr. No.* 35: 43. 1936): U.S.A., Washington (J. M. Grant 970, hb. Lloyd 39.000-BPI). — Fide D. P. Rog. & Jacks. in *Farlowia* 1: 269. 1943 = *Aleurodiscus amorphus*.

DESCRIPTIONS & ILLUSTRATIONS.—De Candolle, *Fl. franç.* 6: 23. 1815 (*Peziza*); Fries, *Elench.* 1: 183. 1828 (*Thelephora*); Richon in *Bull. Soc. bot. France* 24: 149 *fs. 1-6.* 1877 (*Corticium*); Schroeter in *Krypt.-Fl. Schles.* 3 (1): 429. 1888, Patouillard, *Essai taxon. Hym.* 53. 1900, von Höhnel & Litschauer in *S.B. Akad. Wien (Math.-nat. Kl., Abt. I)* 116: 799 *pl. 1 f. 2.* 1907, Burt in *Ann. Missouri bot. Gdn* 5: 180 *f. 1.* 1918, Lloyd, *Mycol. Writ.* 6: 926 *pl. 147 fs. 1666, 1667.* 1920, & Bourdot & Galzin, *Hym. France* 331. 1928 (all as *Aleurodiscus*).

TYPE.—L 910.267-343.

The specimen indicated above as type (L 910.267-343) is labelled in Persoon's own handwriting, "*Thelephora amorpha* Fries El. 183 / *Peziza* Pers. *Syn.* p. 657." Another specimen in Persoon's herbarium is labelled, "*Peziza amorpha.* Pers. *Syn.* 657. *Natura aut substantia Theleph., forma Peziz[ae]. / in cortice abietis / Thelephora amorpha* Fr. El. *fung. p.* 183", all in Persoon's handwriting except the words "*Peziza . . . in cortice abietis*", which were written by Mougeot. Both specimens represent the fungus now universally associated with the name *Peziza amorpha* and its isonyms. The species was distributed by Mougeot & Nestler, *Stirpes Crypt. vogeso-rhenanae, Fasc. 4: No.* 398. 1813 as *Peziza amorpha* (n.v.), evidently after Persoon had so named the specimen Mougeot had sent him. Fries got acquainted with the species through material he received from the 'Alps' from Mougeot.

For *Thelephora laxa* Pers., see page 57.

ALEURODISCUS DIGITALIS (A. & S. per Pers.: Fr.) Donk

*Peziza digitalis* A. & S., *Consp. Fung. nisk.* 315 *pl. 5 f. 1.* 1805 (devalidated name). — *Peziza digitalis* A. & S. per Pers., *Mycol. europ.* 1: 280. 1822. — *Cyphella digitalis* (A. & S.

per Pers.) Fr., Syst. mycol. 2: 201. 1822. — *Solemia digitalis* (A. & S. per Pers.: Fr.) Quél., Ench. Fung. 214. 1886. — *Chaetocypha digitalis* (A. & S. per Pers.: Fr.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Aleurodiscus digitalis* (A. & S. per Pers.: Fr.) Donk in Reinwardtia 1: 210. 1951.

DESCRIPTIONS & ILLUSTRATIONS.—Secretan, Mycogr. suisse 3: 632. 1833; Patouillard, Tab. anal. Fung. 1: 18 f. 29. 1883; Haller in Schweiz. Z. Pilzk. 29: 17 (2) fs. 1951; Pilát in Acta Mus. nat. Pragae B 9 (2): 88 fs. 89–91; (all as *Cyphella*).

TYPE LOCALITY.—Germany, Oberlausitz.

SOME SPECIMENS EXAMINED.—FRANCE, Vosges (hb. Pers.-L 910.256–1861; small remnants of fruit-bodies only), Bruyères (Moug. & Nestl., Stirp. Crypt. vog.-rhen. No. 585), Corcieux and other localities (Galzin, hb. Bourd. 4733, 4734, 6892, 37.333), two specimens sent by Quélet (hb. Fr.-UPS; not microscopically examined). SWITZERLAND, (Chaillet, hb. Pers.-L 910.261–986, small remnant of a fruit-body only), Corcelles near Neuchâtel (Morthier, P, & distributed in Thüm., Mycoth. univ. No. 515 & Rab. & Wint., Fungi europ. exs. No. 2631).

The alternative disposition to placing this species in *Aleurodiscus* is keeping it apart in a small genus of its own, which would be characterized by its thimble-shaped, short-stalked, membranous and non-gelatinous fruit-body, the big basidia which form a hymenium lacking noticeable sterile elements, and the voluminous, smooth, non-amyloid spores, a combination of features that would differentiate it from *Gloeosoma* (*Aleurodiscus vitellinus*) and *Aleurocystis* (*Aleurodiscus hakgallae*). Both have gelatinous fruit-bodies and characteristic sterile elements between the basidia (lamprocystidia, or 'metuloids', in *Aleurocystis*).

#### ***Aleurodiscus magnisporus* (Burt) Donk, comb. nov.**

*Stereum magnisporum* Burt in Ann. Missouri bot. Gdn 7: 207 f. 37, pl. 6 f. 65. 1920. — *Cytidia magnispora* (Burt) Welden in Mycologia 50: 305 f. 2. 1958.

DESCRIPTION & ILLUSTRATION.—Welden in Mycologia 50: 305 f. 2. 1958 (*Cytidia*).

HOLOTYPE.—Jamaica, Chester Vale (W. A. & E. L. Murrill 328, comm. NY, hb. Burt-FH, hb. Bourd. 31.209).

SPECIMEN EXAMINED.—Portion of type (hb. Bourd., as *Cytidia magnispora*).

#### ***Aleurodiscus hakgallae* (Berk. & Br.) Donk, comb. nov.**

*Corticium hakgallae* Berk. & Br. in J. Linn. Soc., Lond. (Bot.) 14: 72. 1873 ("hakgallae"). — *Peniophora hakgallae* (Berk. & Br.) Cooke in Grevillea 8: 20 pl. 124 f. 10. 1879 ("habgallae"). — *Lloydella hakgallae* (Berk. & Br.) Bres. apud Killerm. in Nat. PflFam., 2. Ausg., 6: 145. 1928 ("habgallae"). — *Cytidia hakgallae* (Berk. & Br.) G. W. Mart. in Lloydia 5: 160 fs. 4–12. 1942 ("habgallae"). — "*Cyphella habgallae*" W. B. Cooke in Mycologia 43: 199. 1951 (error). — *Aleurocystis hakgallae* (Berk. & Br.) G. Cunn. in Trans. roy. Soc. New Zeal. 84: 235 f. 2. 1956.

"*Artocreas poroniaeformis*" Berk. & Br. in J. Linn. Soc., Lond. (Bot.) 14: 73. 1873 (error for '*Michenera poroniaeformis*'); Sacc., Syll. Fung. 6: 653. 1888 ("*Michenera poroniaeformis*"); P. Henn. in Nat. PflFam. 1 (1\*\*): 120. 1898 ("*M. poroniiiformis*"); (nomen anamorphosis). — *Matula poroniaeformis* (Berk. & Br.) Mass. in J. R. microsc. Soc. II 8: 176. 1888. — Monotype: Ceylon (Thwaites 309, K). — Fide Petch in Trans. Brit. mycol. Soc. 11: 72, 80. 1926 = *Peniophora hakgallae* (imperfect state).

*Michenera rompelii* J. Rick in Ann. mycol., Berl. 2: 243. 1904 (nomen anamorphosis). — *Matula rompelii* (J. Rick) Lloyd, Mycol. Writ. 2: 391. 1908. — Type locality: Brazil, Rio

Grande do Sul, São Leopoldo (J. Rick). — Fide G. W. Mart. in *Lloydia* 5: 162. 1942 = *Cytidia hakgallae*.

*Cytidia cornea* Lloyd, Mycol. Writ. 5: 656 fs. 935-937. 1917. — *Aleurodiscus corneus* (Lloyd) Lloyd, Mycol. Writ. 6: 930 pl. 148 f. 1688. 1920. — Monotype: Union of South Africa (A. V. Duthie 154, hb. Lloyd 34.063-BPI). — Fide G. W. Mart. in *Lloydia* 5: 161. 1942 & Talbot in *Bothalia* 6: 477. 1956 = *Cytidia hakgallae*.

*Aleurodiscus capensis* Lloyd, Mycol. Writ. 6: 930 pl. 148 f. 1687. 1920. — *Gloeosoma capensis* (Lloyd) "McGinty": Lloyd, Mycol. Writ. 6: 1088. 1921 (name not definitely accepted). — *Aleurocystus capensis* (Lloyd) Stevenson & Cash in Bull. Lloyd Libr. No. 35: 42. 1936 (name not accepted). — Monotype: Union of South Africa (van der Bijl 833, hb. Lloyd 34.029-BPI). — Fide G. W. Mart. in *Lloydia* 5: 161. 1942 & Talbot in *Bothalia* 6: 477. 1956 = *Cytidia hakgallae*.

DESCRIPTIONS & ILLUSTRATIONS.—Petch in Ann. R. bot. Gdns Peradenyia 9: 135. 1924 & 9: 292. 1925, & in Trans. Brit. mycol. Soc. 11: 78 pls. 2, 3. 1926 (*Peniophora*); Martin in *Lloydia* 5: 160 fs. 4-12. 1942 (*Cytidia*); W. B. Cooke in Mycologia 43: 208 fs. 1, 2, 13, 19, 23. 1951 (*Cytidia*); Talbot in *Bothalia* 6: 477 f. 17. 1956 (*Cytidia*).

TYPE.—Ceylon, Hakgalla ("Habgalla") (Thwaites 339, K).

SPECIMEN EXAMINED.—Type of *Cytidia cornea*, comm. Lloyd 154, hb. Bourd. 18.242.

#### ALEURODISCUS VITELLINUS (Lév.) Pat.

*Exidia vitellina* Lév. in Ann. Sci. nat. (Bot.) III 2: 219. 1844. — *Hirneola vitellina* (Lév.) Fr. in K. svenska VetAkad. Handl. 69: 147. 1848. — *Cyphella vitellina* (Lév.) Pat. in Bull. Soc. mycol. France 3: 121 pl. 10 f. 1. 1887. — *Auricula vitellina* (Lév.) O.K., Rev. Gen. Pl. 2: 844. 1891. — *Chaetocypha vitellina* (Lév.) O.K., Rev. Gen. Pl. 2: 848. 1891. — *Aleurodiscus vitellinus* (Lév.) Pat., Essai taxon. Hym. 54. 1900. — *Gloeosoma vitellinum* (Lév.) Bres. in Ann. mycol., Berl. 18: 51. 1920.

*Exidia catillus* Mont. in C. Gay, Hist. Chile 7 (Bot., Pl. cell.): 392. "1850" [1852]. — *Hirneola catillus* (Mont.) Mont., Syll. 182. 1856. — *Auricula catillus* (Mont.) O.K., Rev. Gen. Pl. 2: 844. 1891. — Monotype: Chile (PC). — Fide Bres. in Ann. mycol., Berl. 18: 51. 1920 = *Gloeosoma vitellinum*.

DESCRIPTIONS & ILLUSTRATIONS.—Montagne in C. Gay, Hist. Chile 7 (Bot., Pl. cell.): 393 pl. 7 f. 12. [1852] (*Exidia*); Patouillard in Bull. Soc. mycol. France 3: 121 pl. 10 f. 1. 1887 (*Cyphella*); Bresadola in Ann. mycol., Berl. 18: 51. 1920 (*Gloeosoma*).

TYPE.—Chile (C. Gay, PC).

SPECIMENS EXAMINED.—Type; Chile (PC).

#### CYPHELLA AUSTRALIENSIS Cooke

*Cyphella australiensis* Cooke in *Grevillea* 20: 9. 1891.

TYPE (only original specimen).—Australia, Melbourne (S. Berggren 378).

Cunningham (1953a: 277) reports that the type is a specimen of an immature *Aleurodiscus*. He gives no further information. Compare also page 108.

#### ALEURODISCUS ZEALANDICUS (Cooke & Phill. apud Cooke) G. Cunn.

*Cyphella zealandica* Cooke & Phill. apud Cooke in *Grevillea* 8: 57. 1879; Sacc., Syll. Fung. 6: 670. 1888 ("zealandica"). — *Chaetocypha zealandica* (Cooke & Phill. apud Cooke) O.K., Rev.

Gen. Pl. 2: 848. 1891 ("zealandica"). — *Aleurodiscus zealandicus* (Cooke & Phill. apud Cooke) G. Cunn. in Trans. roy. Soc. New Zealand 84: 254 f. 7. 1956.

DESCRIPTION.—Cunningham in Trans. roy. Soc. New Zealand 84: 254 f. 7. 1956 (*Aleurodiscus*).

TYPE (only original specimen).—New Zealand, Otago, Winton (S. Berggren 230, K).

#### 5.—CYTIDIA Quél.

[*Thelephora* trib. *Resupinatus* A. R. *spurii* Fr., Syst. mycol. 1: 441. 1821. — Lectotype (Donk in Reinwardtia 1: 215. 1951): *Thelephora salicina* Fr.]

*Stereum* [sect.] *Cartilaginae* Fr., Elench. 1: 169. 1828, on p. 180 as "Subcartilagineae cераееve". — Lectotype (Donk in Reinwardtia 1: 215. 1951): *Thelephora salicina* Fr.

*Corticium* trib. *Apus* Fr., Epicr. 557. 1838 (not validly published). — Lectotype (Donk in Reinwardtia 1: 215. 1951): *Corticium salicinum* (Fr.) Fr.

*Corticium* [sect.?] *Marginata* Fr., Monogr. Hym. 2: 262. 1863 (nomen nudum). — Lectotype: *Corticium salicinum* (Fr.) Fr.

*Corticium* [sect.?] *Lomatia* Fr., Hym. europ. 646. 1874. — *Lomatia* (Fr.) P. Karst. in Bidr. Känn. Finl. Nat. Folk 48: 403. 1889; not *Lomatia* R. Br. (1810 Proteaceae; nom. cons.). — Lectotype (Donk in Reinwardtia 1: 215. 1951): *Corticium salicinum* (Fr.) Fr.

*Cytidia* Quél., Fl. mycol. France 25. 1888. — *Corticium* subgen. *Cytidia* (Quél.) Sacc. in Fl. ital. crypt., Hym. 1163. 1916.

*Lomatina* P. Karst. in Hedwigia 31: 220. 1892. — *Cytidia* sect. *Lomatina* (P. Karst.) W. B. Cooke in Mycologia 43: 202. 1951 ≡ *Lomatia* (Fr.) P. Karst. ≡ *Corticium* sect. *Lomatia* Fr.

Fruit-body cup-shaped at first, becoming expanded and more or less appressed to substratum with margin upturned when dry, often becoming irregular in outline, often confluent, rather large (–15 mm in diameter); outside somewhat silky, becoming naked; inside blood-red, with low blunt warts towards centre, drying somewhat wrinkled; substance rather thick-membranous, tough-gelatinous, monomitic. Hyphae with strongly gelatinized wall; clamp-connections present. Basidial region (hyphidial hymenium) consisting of simple or branched hyphal terminations and basidia; the latter originating deep in this region, at first vesicular, than considerably elongating, finally projecting, long-clavate, flexuous, relatively slender; sterigmata 2–4, strongly curved. Spores cylindrical, curved, rather long (10–18  $\mu$ ), colourless, with smooth, non-amyloid wall (in the type species).

On branches. Temperate Europe and North America.

MONOTYPE.—*Cytidia* "*rutilans* Pers. litt. ad Mougeot" ex Quél. = *Corticium salicinum* (Fr.) Fr. = *Cytidia salicina* (Fr.) Burt.

EXAMPLES.—Personally I know one species (*C. salicina*) that belongs here. Other species that seem to answer the above generic description are *Cytidia patelliformis* (Burt) Welden in Mycologia 50: 304 f. 1. 1958 and, perhaps, *Cytidia sarcoides* (Fr.) Herter sensu W. B. Cooke (spores ovoid) and *Cytidia stereoides* W. B. Cooke (spores cylindrical, 18–22  $\mu$  long).

*Cytidia* is among the finest examples of genera with a hyphidial hymenium (cf. Donk, 1957b: 4), viz. with a hymenial region composed of sterile, more or less modified hyphal elements (hyphidia) and basidia of deep origin. The hyphidia are in this case more or less branched and may perhaps be termed dendrohyphidia. The basidia-initials develop in the deeper portions of the hymenial region and have to elongate considerably to reach, and project beyond, the surface and to produce their spores.

This situation clearly distinguishes *Cytidia* from *Auriculariopsis* Maire (p. 76). It also suggests that the genus may be related with other genera characterized by hyphidial hymenia, or in which such hymenia may be encountered, like *Vuilleminia* Maire (fruit-body strictly resupinate) and *Aleurodiscus*. I can see no reason widely to separate *Cytidia* from these two genera and believe that it should tentatively be classed with these at least in the same family, viz. Corticiaceae.

W. B. Cooke's generic description (1951: 201) of *Cytidia* runs: —

“Receptacles coriaceous to fleshy-gelatinous, cup-shaped, sessile, attached at a central point, scattered or crowded, often confluent; hymenium even at first, becoming somewhat wrinkled or veined in some cases; basidia simple; spores hyaline to yellowish, amyloid in Melzer's reagent.”

This definition invites some comments. First, in most species referred here by Cooke, the fresh or re-soaked fruit-bodies are disk-shaped, flat, completely appressed to the substratum (rather than cup-shaped): it is often only after drying that they become more or less disk- to cup-shaped. Secondly, the introduction of the word ‘coriaceous’ is a deviation from the current conception: compare Bourdot & Galzin (1928: 145), “charnus céracés subgelatineux”. In an artificial genus like Cooke's *Cytidia*, not insisting upon ‘fleshy-gelatinous’ would open the door for many other species. In fact, one wonders why Cooke has not entered the species with more or less cupulate fruit-bodies that are still retained in *Corticium* Fr. Thirdly, the spores are amyloid perhaps in only one or two species of Cooke's conception; for instance *Corticium hakgallae* and such European species as *Cytidia salicina* and *Cyphella ampla* positively have non-amyloid spores! Finally, there is nothing in Cooke's diagnosis that would exclude the disk- or cup-shaped species of *Aleurodiscus*; in fact, it fits those species well. Under these circumstances it is not surprising that Cooke lists *Gloeosoma* as a synonym of *Cytidia*, however, without any mention of its only species, which is close to, if not congeneric with, *Aleurodiscus*.

To get a more natural genus than Cooke's it will be necessary to exclude such taxa as are obviously aleurodiscoid, like *Gloeosoma*, and *Corticium hakgallae* and *Stereum magnisporum* Burt. These species have big to exceptionally big basidia (very broad in their apical portion) and voluminous, often amyloid spores and, hence, are considered to belong to *Aleurodiscus* in this paper (p. 66). Moreover, all species with euhymenia (superficial basidia-initials) should apparently also be removed: see *Auriculariopsis* (p. 76). This does not mean that *Cytidia* would become a homogeneous group; further studies will have to decide in this matter.

All and all together, with my actual knowledge of this group only a few typical species remain; of these I have studied only *Cytidia salicina*.

HISTORICAL.—A small series of species has been bothering mycologists for a long time as to the systematic position of its members: are these to be assigned to *Corticium* Fr. and related genera or are they to be placed near *Cyphella* (originally *Peziza* L.), or in current terms, are they Corticiaceae or Cyphellaceae?

The group I have in mind is the one Fries (1821: 441) first called *Thelephora* trib.

*Resupinatus* A. R[esupinati] *spuri* group\* (that is, species 1–3). Its contents: *Thelephora evolvens* Fr. per Fr., *T. salicina* Fr., *T. quercina* Pers. per Fr. Some years afterwards (Fries, 1828: 169, 180) the group was called *Thelephora* trib. *Apus* C. *Auricularia* †† *Cartilagineae* (“Subcartilagineae ceraceaeve” on page 180) group\* Ceraceae, molles, extus villosae pallidiores. Notable additions to the contents: *Peziza amorpha* Pers. (included with misgivings), *Thelephora flocculenta* Fr., *T. sarcoides* Fr. Still later the group reappears as *Corticium* trib. *Apus*\*\* E *cupulari expansa* (Fries, 1838: 558), which Fries eventually called *Corticium* I. *Lomatia* Fr. It finally included (Fries, 1874: 646; European species only), in the order given, the following species:

(i) *Corticium evolvens* (Fr. per Fr.) Fr., a species which had evolved from “junior subrotunda clausa. dein evolvens subcupulaeformis” (Fries, 1815: 154) to “resupinatum, marginatum l. effuso-reflexum” (Fries, 1874: 646). This name Fries reserved for the not completely resupinate specimens of the fungus that is now often called *Corticium evolvens*, or *Corticium laeve* (Pers. per Fr.) Fr. (as described by Bourdot & Galzin, 1928: 183).

(ii) *Corticium boltonii* Fr., which will not be taken into further consideration here.

(iii) *Corticium salicinum* (Fr.) Fr., a well-known species which has also been called *Cytidia rutilans* (Pers.) ex Quél.

(iv) *Corticium sarcoides* (Fr.) Fr., which is separately discussed at some length elsewhere in this paper (p. 61).

(v) *Corticium flocculentum* (Fr.) Fr. This species has also been completely misunderstood: it seems referable to *Corticium evolvens* (see p. 53), rather than to *Cyphella ampla*.

(vi) *Corticium versiforme* (Fr.) Fr. This species has never been referred to the ‘Cyphellaceae’.

(vii) *Corticium amorphum* (Pers. per Purt.) Fr. This is the well-known species that currently is called *Aleurodiscus amorphus* (Pers. per Purt.) J. Schroet. (see p. 67).

(viii) *Corticium juniperinum* (Weinm. ex Fr.) Fr. This species has never been included in the ‘Cyphellaceae’.

(ix) *Corticium populinum* (Sommerf.) Fr. This is according to Bresadola (*apud* Egeland, 1912: 374) again *Corticium laeve* “Pers. non Fr.” (= *Corticium evolvens*). It has never been referred to the ‘Cyphellaceae’.

*Corticium* I. *Lomatia* was subsequently raised to generic rank by Karsten (l.c., 1889) as *Lomatia* (Fr.) P. Karst. of which he described only one Finnish species, viz. *Corticium salicinum*. It soon appeared that the name was preoccupied and it was changed into *Lomatina* P. Karst. As type species of *Lomatia* and its isonym *Lomatina*, as well as of the string of names preceding these two and mentioned above, Donk (1951: 215) selected *Corticium salicinum*.

From the above survey it appears that Fries included in *Corticium* I. *Lomatia* two species that have been referred to the ‘Cyphellaceae’ by a number of authors, viz. *Corticium salicinum* and *C. amorphum*. The first is type species of *Lomatia* = *Lomatina*, the second, of *Aleurodiscus*.

In the meantime Quélet (1888: 25) had based a genus *Cytidia* Quél. on *Cytidia*



"*rutilans* Pers. litt. ad Moug.", a name he took up to replace *Corticium salicinum* (which he cited as a synonym). His generic description includes "Spore sphérique", and his specific one, "Spore sphérique (σ<sup>mmoo</sup>8)", which, if correct, would make *Cytidia rutilans* a quite different species from *Corticium salicinum*. No doubt he committed an error: the indication, 'spores cylindrical, curved, 12–18 μ long' would have been correct. It is now currently agreed upon that *Cytidia* (1888) is an earlier available name for *Lomatina* (1892).

*Cytidia* has been taken up for a genus of gradually increasing contents. When von Höhnelt & Litschauer (1908: 57, 61) added to the genus *Corticium flocculentum* (Fr.) Fr. (as conceived by them, that is, as identical with *Cyphella ampla* Lév.) it became heterogeneous. Later additions did not improve this situation.

Fries's conception of the group he would afterwards call '*Lomatia*' (1849: 336) shows that he did not consider it related to *Cyphella*: "Ab [*Cyphella*] clare differunt *Corticia* cupularia, hymenio ceraceo nec definite terram spectante." Patouillard (1900: 54) was of a different opinion; he included *Cytidia* in his "Cyphellés". He was followed, for instance by Pilát (1925c: 64). On the other hand, Killermann (1928: 142) referred the genus to the Thelephoraceae as a genus of the tribus Aleurodisceae.

#### CYTIDIA SALICINA (Fr.) Burt

*Thelephora salicina* Fr., Syst. mycol. 1: 442. 1821; not *Thelephora salicina* Pers., Mycol. europ. 1: 132. 1822. — *Corticium salicinum* (Fr.) Fr., Epicr. 558. 1838. — *Auricularia salicina* (Fr.) Quél., Ench. Fung. 208. 1886. — *Lomatia salicina* (Fr.) P. Karst. in Hedwigia 28: 27. 1889; in Bidr. Känn. Finl. Nat. Folk 41: 404. 1889. — *Terana salicina* (Fr.) O.K., Rev. Gen. Pl. 2: 872. 1891. — *Cytidia salicina* (Fr.) Burt in Ann. Missouri bot. Gdn 11: 10. 1924.

*Exidia cinnabarina* [Berk. & C.]; Berk. in Grevillea 1: 166. 1873 (as a synonym). — Specimen: U.S.A., New York (Sartwell, hb. M. A. Curt. 3464, UPS). — Fide Berk. in Grevillea 1: 166. 1873 & Berk. & Br. in Ann. Mag. nat. Hist. IV 17: 137. 1876 = *Corticium salicinum*.

[*Thelephora*?] *rutilans* Pers. ("litt. ad Moug."); Quél., Fl. mycol. France 25. 1888 (as a synonym). — *Cytidia rutilans* (Pers.) ex Quél., Fl. mycol. France 25. 1888. — Type locality: France, Vosges (leg. J. B. Mougeot).

MISAPPLICATIONS.—*Thelephora cruenta* Pers. sensu A. & S., Consp. Fung. n. sp. 277. 1805 (var. *α*, *sanguinea* A. & S.); J. Schroet. in Krypt.-Fl. Schles. 3 (1): 423. 1888 (*Corticium*); P. Karst., Finl. Basidsv. 156. 1899 (*Lomatina*); Herter in KryptFl. Brandenb. 6: 83. 1910 (*Cytidia*). — Fide Fr., Elench. 1: 86. 1828 = *Thelephora salicina*.

*Peziza sarcoides* (Jacq.) Pers. sensu Wahlenb., Fl. lappon. 534. 1812. — Fide Fr., Elench. 1: 186. 1828 = *Thelephora salicina*.

DESCRIPTIONS & ILLUSTRATIONS.—Karsten, Ic. sel. Hym. Fenn. Fasc. 1: 6 pl. (2) f. 10. 1885 (*Corticium*); Burt in Ann. Missouri bot. Gdn 11: 10 pl. 1 f. 8. 1924 (*Cytidia*); Bourdot & Galzin, Hym. France 145. 1928 (*Cytidia rutilans*); W. B. Cooke in Mycologia 43: 202 fs. 4, 17, 18, 20, 30. 1951 (*Cytidia*).

TYPE.—Not known to be in existence.

SPECIMENS EXAMINED.—"*Corticium salicinum* Fr. / Petrop." (UPS, presumably sent by Weinmann, labelled in Fries's own handwriting; cf. Fries, 1828: 186); also some specimens collected in Sweden, in Fries's own herbarium labelled "*Corticium salicinum* Fr." and apparently approved by him. In Persoon's herbarium is a specimen labelled "*Thelephora salicina* Fr." perhaps in Sommerfeldt's handwriting

(L 910. 267-780). — Further about 80 collections (mainly UPS) from Sweden, Norway, Finland, Canada, and U.S.A.

The identity of *Cytidia rutilans* (Pers.) ex Quél. has already been discussed (p. 72-73).

*Exidia cinnabarina* Berk. & C. is apparently only a herbarium name given to a collection from the U.S.A. (New York, leg. Sartwell, M. A. Curtis 3464). A portion of it is at Uppsala and was annotated by Fries, "cfr. *Corticium salicinum* Fr." This disposition has been adopted by Berkeley as cited above in the synonymy.

A wide-spread confusion of the species with *Thelephora cruenta* Pers. has occurred. This question will be found discussed in the present paper on page 49, where it is concluded that the type of *Thelephora cruenta* is identical with *Hymenochaete mougeotii* (Fr.) Cooke. *Thelephora cruenta* was first misapplied to the present species by von Albertini & von Schweinitz. They gave the first good description of *Cytidia salicina*, which they identified with *Thelephora cruenta*, typical form ("α. sanguinea").

This is rather a 'northern' species in Europe and North America. It is less frequent in Central Europe. No doubt it also occurs throughout Siberia. Most specimens I have seen were collected in the north of Sweden and Norway. Out of the about 80 collections examined only one collection was marked as found on *Alnus* sp., and one on *Populus* sp. In all other cases where the substratum was indicated, this appeared to be various species of *Salix*. W. B. Cooke also reports it from *Prunus serotina*. The species has also been found in New Zealand from where Cunningham (1956: 232) reports it from *Populus*, *Salix*, and *Pyrus malus*.

### Species of doubtful systematical position

#### CYPHELLA STICTOIDEA Speg.

*Cyphella stictioidea* Speg. in An. Soc. cient. argentina 17: 80. 1884.

? *Cytidia wettsteinii* Bres. apud Höhn. in Denkschr. math.-nat. Kl. Akad. Wiss. Wien 83: 6. 1907. — *Corticium wettsteinii* (Bres. apud Höhn.) Sacc. & Trott. in Sacc., Syll. Fung. 21: 400. 1912. — Type locality: Brazil, near São Paulo.

DESCRIPTION.—Spegazzini, l.c. (Saccardo, Syll. Fung. 6: 680. 1888).

Almost mature basidia clavate, 42-60 × 8.5-11 μ; sterigmata not seen. Spores ellipsoid, with a slight tendency to be widest in basal half, somewhat flattened adaxially, colourless, smooth. A few irregular, somewhat club-shaped cells from outside seen; these are thin-walled, granular-incrusted. Context presumably rather gelatinous.

TYPE-DISTRIBUTION.—Paraguay, forest of Caá-guazú (Balansa 3506). Copies examined, PC, K.

The scanty notes given above were taken long ago from the copy at Paris (PC). No completely mature basidia were seen, but the rather broad apical portion of the nearly mature ones would seem to exclude a species of the Dacrymycetaceae. The few basidia as drawn in my manuscript-note also suggest that they formed part of a typical (and not a hyphidial) hymenium.

I suspect that *Cytidia wettsteinii* Bres. is synonymous. It came from southern

Brazil, that is, from an adjacent region, and also grew on bamboo. There seems no basis for referring it to *Cytidia pezizoides* (Pat.) Pat. as was done by W. B. Cooke (1951: 207).

#### CYTIDIA PEZIZOIDES (Pat.) Pat.

*Corticium pezizoides* Pat. in J. Bot. (ed. Morot), Paris 5: 314. 1891; not *C. pezizoideum* Ell. & Ev. in J. Mycol. 4: 74. 1888 (n.v.); not *C. pezizoideum* (Schw.) Schrenck in Bull. Torrey bot. Cl. 21: 288. 1894. — *Cytidia pezizoides* (Pat.) Pat., Essai taxon. Hym. 54 f. 37. 1900. — “*C[yphella] pezizoides*”: W. B. Cooke in Mycologia 43: 199. 1951 (error).

ILLUSTRATION.—Patouillard, l.c., 1891 (*Corticium*) & l.c.. 1900 (*Cytidia*).

Fruit-body —500 (or more)  $\mu$  thick, round, more or less confluent, 1–4 mm in diam., closely appressed, margin darker (brownish), free, slightly recurved. Hyphae rather distinctly radially-parallel, at one side deflecting towards hymenium, with strongly gelatinous walls. Basidia arranged into a typical hymenium, when young (?) with strongly granular contents and resembling gloecystidia, 45–60(–68)  $\times$  5.5–8.5  $\mu$ ; sterigmata 2–4, 5–8  $\mu$  long. Spores ovoid-subellipsoid, adaxially flattened, colourless, smooth (6–)8–10  $\times$  5–6  $\mu$ .

TYPE & SPECIMEN EXAMINED.—Tonkin (Bon 4187, PC, as *Gloeocyphella cinerea* Pat.).

Martin (1942: 162 fs. 13–15) gives some notes on a rather scanty collection from Panama which he refers here. He also refers here *Cytidia tremellosa* Lloyd, which seems not to be conspecific to me (see below).

This species is very different from the type of *Cytidia* and should be excluded from the genus. If it has to be forced into one of the existing genera it would be better classed as a species of *Auriculariopsis* but I am not disposed to accept a close relationship with the type of that genus either.

#### CYTIDIA TREMELLOSA Lloyd

*Cytidia tremellosa* Lloyd, Mycol. Writ. 4: 516. 1912.

DESCRIPTIONS & ILLUSTRATIONS.—Bourdot *apud* Lloyd, Mycol. Writ. 4: 516 f. 513. 1912; Burt in Ann. Missouri bot. Gdn 11: 12 pl. 1 f. 9. 1924.

Context strongly gelatinized. Gloecystidia-like swollen vesicles, usually pear-shaped, with granular, yellow contents especially noticeable in young portions of fruit-body, perhaps intergrading into basidia. Basidia (50–)58–70  $\times$  8–10  $\mu$ ; sterigmata 2–4, 5–6.5  $\mu$  long. Spores ellipsoid-ovoid, adaxially flattened, smooth, 9–11  $\times$  5.5–6.5  $\mu$ ; contents granular.

TYPE & SPECIMEN EXAMINED.—U.S.A., Louisiana (Lloyd, hb. Bourd. 8743, presumably part of Lloyd 2402, NY, hb. Burt-FH).

*Cytidia tremellosa* has been reduced to a synonym of *Cytidia pezizoides* (Pat.) Pat. (see above), described from Tonkin, by Martin (1942: 162, as a suggestion) and by W. B. Cooke (1951: 207). A careful re-examination of the types seems necessary: judging from my very incomplete notes I would not be surprised if the structure were more different than one would suspect from published descriptions.

#### CYTIDIA SIMULANS Lloyd

DESCRIPTION & ILLUSTRATION.—Talbot in Bothalia 6: 478 f. 18. 1956.

In many ways a remarkable species (two kinds of basidiospores) collected once in South Africa. From Talbot's description one would conclude that this species has a typical hymenium (small, slender basidia), like *Auriculariopsis*. It is difficult to see why it should be considered congeneric with *Cytidia salicina*.

Other species referred to *Cytidia* but not discussed in the present paper: —

*Cytidia lanata* W. B. Cooke in *Mycologia* **43**: 205 fs. 5, 9, 25. 1951.

*Cytidia stereoides* W. B. Cooke in *Mycologia* **43**: 206 fs. 7, 14, 21, 28. 1951.

#### 6.—AURICULARIOPSIS Maire

*Auriculariopsis* Maire in *Bull. Soc. mycol. France* **18** (Suppl.): 102. 1902.

Fruit-body at first thimble- to cup-shaped, sessile, remaining so or usually becoming rather flattened and often irregular in outline, up to rather large (—15 mm in diameter); outside tomentose, whitish; inside flesh-coloured, becoming brown, often radially veined. Substance rather thick-membranous, tough-gelatinous. Hyphae densely arranged parallel to hymenium, with more or less gelatinized wall, forming a dense layer below tomentum which is formed of loose, flexuous hyphae; clamp-connections present. Basidia densely packed, clavate, forming a regular, somewhat thickening palissade hymenium, about  $30-35 \times 4-5 \mu$ , chiasitic, 4-spored. Spores cylindrical, slightly curved, medium-sized (8–12  $\mu$  long), colourless ("légèrement teintées d'isabelle en masse", in the type species according to Bourdot & Galzin); wall smooth, non-amyloid.

On branches. Temperate Northern regions.

MONOTYPE.—*Cyphella ampla* Lév.

ONLY SPECIES.—*Auriculariopsis ampla* (Lév.) Maire.

*Auriculariopsis* was introduced for a single species, viz. *Cyphella ampla* Lév., which has an interesting history. Its subgelatinous tissue made it a troublesome species to place. It was for some time referred to *Auricularia* Bull. Thus Fuckel called it *Auricularia syringae* Fuck. Soon Quélet followed, with this difference that he recognized it as *Cyphella ampla* and renamed it *Auricularia leveillei* Quél. on the transfer. Suggestion soon played its tricks: Hennings (1896: 4–5) asserted of 'undisputable material' of *Auricularia leveillei* that it "gehört zweifellos zur Gattung *Auricularia*; sie besitzt die typischen geteilten und verzweigten Basidien, wie mir dies auch von Dr. A. Möller, dem ich Exemplare . . . zur Untersuchung mitteilte, bestätigt worden ist!" This is an error: the basidia are undivided with apical sterigmata as was already known to Lévillé ("basides tétraspores") and afterwards reported by Maire and Bresadola (1903: 111, "basidia clavata, apice 4-sterigmatica"). Moreover, the basidia are chiasitic (apical and transversal mitoses) according to Maire (1902: 102 pl. 3 f. 22).<sup>20</sup>

When Maire studied *Cyphella ampla* he founded a special genus for it, *Auriculariopsis* Maire, stating that the species "diffère de *Cyphella* par sa texture gelatineuse qui

<sup>20</sup> Maire (1900: 123) originally stated that the spindle was directed along the length axis of the basidium.

le fait ressembler à s'y méprendre aux *Auricularia*; comme ces derniers, il se racornit par la sécheresse et se gonfle par l'humidité." He did not compare it with *Cytidia* Quél. The inclusion in *Lomatina* = *Cytidia* was performed by von Höhnel & Litschauer, who thus fused two elements that mainly agreed in gross characters such as habit and context of the fruit-body.

There is no doubt, in my opinion, that the types of *Cytidia* (*Corticium salicinum*) and of *Auriculariopsis* do not belong in the same genus: the two species have an entirely different structure of the hymenium as has already been explained under *Cytidia* (p. 71). The relations of *Auriculariopsis ampla* are apparently also with the Corticiaceae, but with a quite different group, more in particular with *Merulius* Fr. *sensu stricto* and I have been tempted for a long time simply to merge *Auriculariopsis* into that genus, and am not yet quite convinced that keeping the two apart is preferable. In any case *A. ampla* may be distinguished from *Merulius* by its centrally attached fruit-bodies, free all around, and by its hymenophore which becomes radially veined rather than meruloid (with reticulately connected veins when dry). Several species of *Merulius* (like *M. tremellosus* Schrad. per Fr.) have about the same structure and consistency.

Other species which like *A. ampla* possess typical euhymenia have been placed in *Cytidia*. As far as I know them they are not congeneric, although they might have been appended here rather than in *Cytidia* until their taxonomic position be better understood.

#### AURICULARIOPSIS AMPLA (Lév.) Maire

*Cyphella ampla* Lév. in Ann. Sci. nat. (Bot.) III 9: 126. 1848. — *Chaetocypha ampla* (Lév.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Auriculariopsis ampla* (Lév.) Maire in Bull. Soc. mycol. France 18 (Suppl.): 102. 1902.

*Cantharellus coemansii* Rab., Fungi europ. exs. No. 209. 1860 (with description). — Type-distribution: Belgium, Ghent (Coemans; Rab., Fungi europ. exs. No. 209). — Fide Tul., Sel. Fung. Carp. 1: 135. 1861 = *Cyphella ampla*.

*Auricularia syringae* Fuck. in Jb. nassau. Ver. Naturk. 27-28: 9. 1873. — *Corticium syringae* (Fuck.) Wint. in Rab. Krypt.-Fl., 2. Aufl., Pilze 1: 338. 1882. — Type distribution: Germany, near Hattenheim, "auf der Münchau" (Fuck., Fungi rhen. No. 2508). — Fide Höhn. & L. in S.B. Akad. Wiss. Wien (Math.-nat. Kl., Abt. I) 115: 1586. 1906 = "*Lomatia flocculenta* (Fries) Lagerh."

*Auricularia leveillei* Quél. in Bull. Soc. bot. France 24: 90. 1877 (nomen provisorium). — *Auricularia leveillei* Cooke & Quél., Clav. Hym. 213. 1878; Quél., Ench. Fung. 207. 1886. — *Hirneola leveillei* (Cooke & Quél.) Forq., Champ. sup. 109. "1886" [1888] (without reference or description, figure only) ≡ *Cyphella ampla* Lév.

*Cyphella cyclas* Cooke & Phill. apud Cooke in Grevillea 9: 94. 1881. — *Chaetocypha cyclas* (Cooke & Phill. apud Cooke) O.K., Rev. Gen. Pl. 2: 847. 1891. — Monotype: Great Britain, Ely (W. Marshall, K).

*Auricularia bresadolae* S. Schulz. in Hedwigia 24: 148. 1885. — *Patila bresadolae* (S. Schulz.) O.K., Rev. Gen. Pl. 2: 864. 1891. — Type locality: Slavonia, Vinkovce.

*Stereum pubescens* Burt in Ann. Missouri bot. Gdn 7: 178 pl. 5 f. 50. 1920. — Holotype: U.S.A., Montana, Sheridan (L. A. Fitch, in Ellis Coll. NY, MO 56.784). — Fide Burt in Ann. Missouri bot. Gdn 11: 10. 1924 = "*Cytidia flocculenta*".

MISAPPLICATIONS.—*Corticium flocculentum* (Fr.) Fr. *sensu* J. Schroet. in Krypt.-Fl. Schles. 3

(1): 423. 1888; P. Henn. in Verh. bot. Ver. Brandenb. 37: 5. 1896 (*Auricularia*; nomen provisorium); Bres. in Ann. mycol., Berl. 1: 111. 1903 (*Cyphella*); Höhn. & L. in S.B. Akad. Wien (Math.-nat. Kl., Abt. I) 116: 758. 1907 (*Cytidia*); Sacc. & Trott. in Sacc., Syll. Fung. 21: 423. 1912 (*Auriculariopsis*).

DESCRIPTIONS & ILLUSTRATIONS.—Quélet in Bull. Soc. bot. France 26: 231. 1880 (*Auricularia leveillei*); Patouillard, Tab. anal. Fung. 1: 113 f. 254. 1884 (*Cyphella*); Bresadola in Ann. mycol., Berl. 1: 111. 1903 (*Cyphella flocculenta*); Burt in Ann. Missouri bot. Gdn 11: 9. pl. 1 f. 7. 1924, Bourdot & Galzin, Hym. France 146. 1928, Donk in Meded. Nederl. mycol. Ver. 18-20: 134. 1931, W. B. Cooke in Mycologia 43: 204 fs. 8, 10, 15, 16, 24. 1951, & Cunningham in Trans. roy. Soc. New Zealand 84: 232 f. 1. 1956 (*Cytidia flocculenta*).

TYPE.—According to original account, France, near Paris (comm. E. Germain, PC); Neuilly (K).

The favourite hosts of *Auriculariopsis ampla* are various species of *Populus* on which it is found throughout Europe, temperate North America, and occasionally in New Zealand (where it has probably been introduced). In the Netherlands it is rather common in the dunes from Oost-Voorne to north of Haarlem. The species also occurs occasionally on other substrata, as *Rubus* (the Netherlands); Cunningham (1956: 233) reports it from New Zealand from *Populus* sp., *Pyrus malus*, and *Salix babylonica*, one collection on each of these hosts.

The above synonymy is on the whole well established. Of *Cyphella ampla* I have seen the type material. Of *Cantharellus coemansii* Rab. and *Auricularia syringa* Fuck. one or more copies of the type-distributions could be studied.

The type of *Cyphella cyclas* Cooke & Phill. (K) is an unmistakable specimen of the present species. The following note is taken from a letter by W. Phillips accompanying the specimen and contains some information omitted from the original description.

“... The exterior is coated with long white hairs rather matted. The hymenium is pale brown: there is an abundance of narrowly elliptic spores often curved, but I was not able to see any of these *in situ*. I concluded however these are the spores. The general outline [of the fruit-body] reminds one of the half of a bivalve shell laid flat on the wood . . .”

#### 7.—STROMATOSCYPHA Donk

*Porothelium* Fr., Obs. mycol. 2: 272. 1818; Specimen Syst. mycol. 6. Dec. 18, 1818; (devaluated name). — *Polyporus* subgen. *Porothelium* (Fr.) per Fr., Syst. mycol. 1: 6, 506. 1821. — *Porothelium* (Fr. per Fr.) Fr., Syst. Orb. veg. 80. 1825; Elench. 1: 125. 1828; Reichenb., Consp. Regni veg. 14. 1828 & Fr., Gen. Hym. 12. 1836 (“*Porothelium*”); not *Porothelium* Eschw. (1824; Trypetheliaceae, Lichenes).

*Stromatoscypha* Donk in Reinwardtia 1: 218. 1951 ≡ *Polyporus* subgen. *Porothelium* (Fr.) per Fr.

Fruit-body consisting of numerous cups densely crowded on a common stroma. Cups globose, appearing closed then opening by an apical pore and becoming disk-to cup-shaped, at first distinct from each other (as can be seen near margin of stroma in not too mature fruit-bodies) then coalescing and becoming irregular by mutual

pressure and further growth and together finally strongly simulating the hymenophore of some species of *Poria*; outside of individual cups silky (by undifferentiated matted hyphal ends), white; hymenium smooth, even, yellowish; context rather floccose, not gelatinized, white. Stroma resupinate, membranous, rather tough, easily separable from substratum; margins more or less strongly byssoid to lacerate. Hyphae of stroma narrow, thick-walled, colourless, with clamp-connections; hyphae of cups parallel, thick-walled at outside and gradually thinner-walled towards hymenium; the outer hyphae not differentiated. Basidia short-clavate, rather small (15–25  $\mu$  long), 2–4 spored; sterigmata thin. Cystidia absent. Spores ellipsoid flattened at adaxial side, small (4–6  $\mu$  long); walls smooth, colourless, non-amyloid.

On rotten wood. Apparently of world-wide distribution.

LECTOTYPE.—*Poria fimbriata* Pers. = *Polyporus fimbriatus* (Pers.) per Fr. — Cf. Donk (1951: 217).

EXAMPLE.—*Stromatoscypha fimbriatum* (Pers. per Fr.) Donk.

As to the correct name for *Porotheleum* (Fr. per Fr.) Fr. (1825), it must be decided whether it is to be considered an (orthographically different) homonym of *Porotheleum* Eschw. (1824; Lichenes) or not. Donk (1951: 218) concluded that the Friesian name is indeed to be treated merely as an orthographical variant of the earlier lichen name, and is hence illegitimate as a later homonym. He replaced it by *Stromatoscypha* Donk. This conclusion was refuted by W. B. Cooke (1957: 682), who thought the two names to be “different” and hence considered *Stromatoscypha* superfluous. There is no doubt, first, that the two names differ (in one letter), and, secondly, that they were given to widely different genera. On the other hand, they seem not to fall among the examples of names not likely to be confused with different termination (Code 1956: Art. 75): the difference is hardly one of termination as in both cases the last syllable is —um. It still is my considered opinion that *Porotheleum* and *Porotheleum* fall within the category of names to be treated as orthographic variants, like *Astrostemma* and *Asterostemma*, *Pleuripetalum* and *Pleuropetalum*, *Columella* and *Columellia*, *Eschweilera* and *Eschweileria*, *Skytanthus* and *Scytanthus*, all examples added to Art. 75, the very same article invoked by Cooke (Code 1952: Art. 82).

In addition, it may be pointed out that from 1828, and in Fries’s own work from 1836, onwards until I discussed the question, the name has been spelt *Porotheleum*, with *-i-*, thus precisely the same as the lichen genus. This was done deliberately even by authors who knew the original spelling; for instance, Murrill (1916: 56) wrote “Porotheleaceae” but added, “The name of the genus on which this family is based was originally written *Porotheleum* . . ., but was soon afterwards changed to the form now in current use.” This was apparently done because that form was considered the more correct one from an orthographic point of view. I am confident that I act in strict agreement with the Code when I take the fungus name *Porotheleum* as illegitimate and value it as a later, though orthographically slightly different, homonym.

*Stromatoscypha* is a very clear-cut and, as far as my knowledge goes, a monotypic

genus.<sup>21</sup> It has been repeatedly enriched with species, but few of the additions can stand a really critical examination. Some essential characters for distinguishing the genus are: Fruit-body consisting of a membranous, resupinate 'stroma' bearing originally globular cups, the hymenium lining the inside of the cups; walls of cups not gelatinous; spores smooth, colourless.

The cups become very crowded towards the centre of a stroma and then simulate the tube-layer of *Poria* Pers. per S. F. Gray (*sensu lato*), but merely to dump the genus into *Poria* is an over-simplification that is not defensible by the mere argument that it is certain to be classed as a *Poria* by collectors. A better solution is to tell the collector that after all he did not collect a species of *Poria*.

From some remarks scattered through the literature one might get the impression that the cup in *Stromatoscypha* is an originally closed (but hollow) globule which soon opens by an apical pore. Such a development would stamp the genus as a very remarkable one, destined to play an important rôle in phylogenetical speculations. However, I am convinced that the cups are open at the top from the start, although they pass through a stage in which the pore is hardly perceptible. The same phenomenon has been reported for the tubes of *Fistulina* (Lohwag & Follner, 1936).

It really is a bizarre procession of fungi that have found a place in the present genus. Several so-called species of *Porothelium* represent the resupinate hydneous fungus *Odontia sudans* (A. & S. per Fr.) Bres. = *Dacryobolus sudans* (A. & S. per Fr.) Fr.: see under *Dacryobolus* Fr. (p. 41). The inclusion of a stalked species of polypores as a typical species of the present genus is discussed on page 60. There is more of this kind. The best policy seems to be to exclude all species previously attributed to the genus except *Stromatoscypha fimbriatum*, and to admit additional species only after they have stood a critical test.

A recent development is the introduction of *Solenia poriaeformis* (Pers. per Mérat) Fuck. by W. B. Cooke (1957: 688): it also has a 'stroma' on (or, rather, in) which numerous cups are seated. It must be emphasized from the start that Cooke's conception of this species is too inclusive: several of the synonyms he lists represent easily distinguishable species. One of the synonyms is *Stigmatolemma incanum* Kalchbr. This South African species as described by Talbot (1956: 479 f. 21) seems to come close to *Peziza conspersa* Pers. (*Solenia grisella* Quél.) of Europe: it has similar, ellipsoid spores, quite different from the globose spores of *Solenia poriaeformis*. If *Stigmatolemma incanum* proves to have a gelatinous context like the other species mentioned, it should serve as the type species of a well-defined genus, *Stigmatolemma* Kalchbr. This genus would not only contain species with cups crowded on a common stroma (and which Cooke refers to *Porothelium*), but also others with scattered cups not connected by any stroma (and which Cooke does not refer to *Porothelium*). *Stigmatolemma* will be treated more fully on a future occasion. The genus clearly demonstrates not only

<sup>21</sup> I am not able to state an opinion about the new species recently described by W. B. Cooke (1957). — Collections from Java are hardly specifically different, but I have not yet gone into this matter carefully.



that a 'stroma' by it self is not sufficient to define a genus in the 'Cyphellaceae', but also that the structure of the stroma should be taken into account.

STROMATOSCFPHA FIMBRIATUM (Pers. per Fr.) Donk

*Poria fimbriata* Pers. in Neues Mag. Bot. 1: 109. 1794 (= Tent. 29. 1797) (devaliated name). — *Boletus fimbriatus* (Pers.) Pers., Syn. Fung. 546. 1801 (devaliated name). — *Porotheleum fimbriatum* (Pers.) Fr., Obs. mycol. 2: 272. 1818 (devaliated name). — *Polyporus* (subgen. *Porotheleum*) *fimbriatus* (Pers.) per Fr., Syst. mycol. 1: 506. 1821 ("fimbriatum"); Pers., Mycol. europ. 2: 108. 1822; not *Polyporus fimbriatus* Fr. in Linnaea 5: 520. 1830 & Syst. mycol. 3 (Ind.): 146. 1832; not *Polyporus fimbriatus* (Bull. per St.-Am.) Gillet, Champ. France, Hym. 662. 1878. — *Boletus fimbriatus* (Pers. per Fr.) Schw. in Schr. naturf. Ges. Leipz. 1: 99. 1822; not *Boletus fimbriatus* Bull. per St.-Am., Fl. agen. 552. 1821. — *Porotheleum fimbriatum* (Pers. per Fr.) Fr., Syst. mycol. 3 (Ind.): 150. 1832; Epicr. 503. 1838. — *Poria fimbriata* (Pers. per Fr.) Lloyd, Mycol. Writ. 5: 740 fs. 1108, 1109. 1917. — *Stromatoscypha fimbriatum* (Pers. per Fr.) Donk in Reinwardtia 1: 219. 1951.

*Peziza porioides* A. & S., Consp. Fung. nisk. 327 pl. 6 f. 5. 1805 (devaliated name). — *Peziza porioides* A. & S. per Pers., Mycol. europ. 1: 275. 1822; Fr., Syst. mycol. 2: 111. 1822. — *Solenia porioides* (A. & S. per Pers.: Fr.) Fuck. in Jb. Nassau. Ver. Naturk. 27-28: 6. 1873; misapplied. — *Phialea porioides* (A. & S. per Pers.: Fr.) Gillet, Champ. France, Disc. 112. 1881. — *Cyphella porioides* (A. & S. per Pers.: Fr.) Quél., Ench. Fung. 215. 1886. — *Eriopeziza porioides* (A. & S. per Pers.: Fr.) Rehm in Rab. Krypt.-Fl., 2. Aufl., Pilze 3: 697. [1892]. — *Henningsomyces porioides* (A. & S. per Pers.: Fr.) O.K., Rev. Gen. Pl. 3 (2): 483. 1898 ("porioides"). — Type locality: Germany, Oberlausitz, Moholzer Haide. Type: L 910.261-510.

*Boletus pezizoides* Schw. in Schr. naturf. Ges. Leipz. 1: 100. 1822. — *Polyporus pezizoides* (Schw.) Steud., Nomencl. bot. Pl. crypt. 348. 1824. — *Porotheleum pezizoides* (Schw.) Schw. in Trans. Amer. phil. Soc. II 4: 160. 1832. — Type locality: U.S.A., N. Carolina. Type: UPS, cf. Lloyd, Mycol. Writ. 3: 423. 1909.

[*Boletus*] "*Polyporus*" *fimbriatus-supinus* Secr., Mycogr. suisse 3: 164. 1833 ("*fimbriatus supinus*") ≡ *Poria fimbriata* Pers.

*Porotheleum lacerum* Fr., Obs. mycol. 2: 273. 1818 (devaliated name). — *Porotheleum lacerum* Fr. per Fr., Elench. 1: 125. 1828 & Syst. mycol. 3 (Ind.): 150. 1832 (nomen nudum?); Epicr. 503. 1838. — Type locality: Sweden.

*Boletus byssinus* Schrad., Spic. Fl. germ. 172 pl. 3 f. 1. 1794 (devaliated name). — *Poria byssina* (Schrad.) Fr., Syst. mycol. 3 (Ind.): 149. 1832 (as a synonym). — *Poria byssina* (Schrad.) per Quél., Fl. mycol. France 383. 1888, misapplied. — *Physisporus byssinus* (Schrad. per Quél.) Cost. & Duf., Nouv. Fl. Champ. 138. 1891, misapplied. — *Tyromyces byssinus* (Schrad. per Quél.) Bond., Trutov. Griby 164. 1953 ("Pers."; incomplete reference), misapplied. — Type locality: Germany, Braunschweig.

*Poria brevipora* Speg. in An. Mus. nac. Hist. nat. Buenos Aires 4: 172. 1899. — Type locality: Argentina, Boca del Riachuelo near Buenos Aires. — Fide Bres. in Ann. mycol., Berl. 14: 228. 1916 = *Porotheleum fimbriatum*.

DESCRIPTIONS & ILLUSTRATIONS.—Patouillard, Essai taxon. Hym. 57 f. 39. 1900 (*Porotheleum*); Lloyd, Mycol. Writ. 5: 740 fs. 1108,<sup>22</sup> 1109. 1917 (*Poria*); Bourdot & Galzin, Hym. France 166. 1928 (*Porotheleum*); Lowe in Techn. Bull., New York St. Coll. For. No. 65: 74. 1946 (*Poria*); W. B. Cooke in Mycologia 49: 684. 1957 (*Porotheleum*).

TYPE.—"*Boletus fimbriatus* Syn. fung. p. 546 / *Polyporus fimbriatus*. Myc. E. p. 108. *Boletus* — Syn. fung. / Germania"<sup>22</sup> (L 910.263-941).

<sup>22</sup> For a photograph of the biggest portion of the type from Persoon's herbarium, see Lloyd (1917: f. 1108 on p. 740).

Persoon's original description of *Poria fimbriata* (1794) is too short for certain recognition of the species, but when supplemented with his subsequent one (1801) and the specimens in his herbarium (including the type, cited above), there is no doubt possible as to the fungus he had in mind. Although not common, the species is wide-spread throughout West Europe and easy to define by its well-developed stroma with strongly developed fibrillose-laciniate margin, and bearing cups of separate origin but soon crowded and then collectively very similar to the hymenophore of a species of *Poria*. There is only one species of this kind in Europe, which facilitates the pigeon-holing of synonyms. Persoon (1801: 546) very clearly emphasized the most characteristic features: "Membranam siccam exhibit. Margo laciniatus; laciniae teres. Pori superficiales, in fungi margine liberi s. inter se subdistant."

*Boletus byssinus* Schrad. has been variously interpreted. Persoon, at first as a suggestion (1801: 548) and later on positively (1825: 108), and Fries (1821: 506) identified it with the present species. In my opinion, this is the best disposition at hand and apparently the correct one: the original account and figure are very suggestive: "... explanatus membranaceus niveus; margine fimbriato . . . Membrana byssacea, late aliquando supra truncos expansa, nivea . . . poris subrotundis obtusis . . . brevissimis, minutis . . ." The figure suggests that a small stroma in young condition was selected for the artist; the scattered 'pores' had not yet become a crowded mass at the centre. In any case the original account does not at all suggest a tender species with true pores. In later years Fries (1832: 149) referred the fungus to *Peziza porioides* A. & S., which, I think, is another synonym of *Stromatoscypha fimbriatum*, as will presently be discussed. A detailed discussion of the misinterpretations of *Boletus byssinus* as species of *Poria* Pers. per S. F. Gray (artificial sense) is reserved for a forthcoming paper.

I believe that *Peziza porioides* A. & S. is another synonym. The rather detailed original description as well as the figure leave hardly any room for a different interpretation. As in the preceding case a small, young stroma was depicted, presumably to avoid too many technical difficulties on the copper plate. To underline this conclusion it is pointed out that *Peziza porioides* is "tota nivea" and that the margin of the stroma is 'byssinum passim fibrilloso-fimbriatum'. In the Leiden copy of the "Conspectus" the white colour of the hand-painted plates have everywhere turned grey. Such a colour deviation in connection with the small colonies depicted might suggest a different species (like *Solenia grisella* Quél.) if the original text is only superficially consulted. Another reason for misunderstanding is that von Albertini & von Schweinitz considered their fungus different from *Poria byssina*, discussed above. Perhaps the substratum ("... in cortibus lignisque abiegnis . . .") is somewhat exceptional, but *Porotheleum fimbriatum* is not selective and has been found on fallen branches of pine. It is surprising to find that only Persoon (1822: 275) has thought of *Porotheleum*, more in particular of *P. lacerum* Fr., in connection with it. Evidently following this lead some later authors (Wallroth, 1833: 480; Rehm) placed *P. lacerum* as a (dubious) synonym under *Peziza porioides*. Merely

judging from the original account Rehm (l.c.) suspected it to be a species of *Eriopeziza* Sacc. — This paragraph had already been written when I came across a specimen in Persoon's herbarium sent by the authors. The original label reads, "*Peziza porioides*". To this Persoon added, "Consp. fung. p." and "Ex Lusatia superiore." The substratum impresses me as the bark of a coniferous branch and the fungus on it is a portion of a young fruit-body, with rather poorly developed stroma and rather spaced cups; it is evidently *Stromatoscypha* and in my opinion represents *S. fimbriatum*.

*Peziza porioides* has been misinterpreted by Fuckel (l.c.). He, and, under his influence, other mycologists have used the names *Solenia porioides* or *Cyphella porioides* for a species which has also been called *Peziza conspersa* Pers. and *Solenia grisella* Quél. The latter species is very different from *Stromatoscypha fimbriatum*: its 'stroma' is a thin, closely adherent felt (rather than a membrane) not forming laciniae at the margin, and the colonies as a rule are small greyish patches on fallen branches of conifers. Neither is this fungus to be identified with *Solenia poriaeformis* (Pers. per Mérat) Fuck. as W. B. Cooke (1957: 688) does. *Peziza conspersa* seems to belong to *Stigmatolemma* Kalchbr. if the type of the latter species has been correctly interpreted by W. B. Cooke.

*Porotheleum lacerum* was one of the two original species of *Porotheleum* (1818), the other being *P. fimbriatum*. As late as 1874 Fries (p. 595) stated to have found it only once. Some years after its publication Fries (1821) suppressed it altogether (not even mentioning it in synonymy), but restored it as a good species after having received *Boletus pezizoides* from von Schweinitz, which fungus he thought exactly the same (1838). He differentiated it from *P. fimbriatum* by the margin of the stroma: "ambitu floccoso-byssino", in the former, and "ambitu lacinii teretibus fimbriato", in the other species; the cups are ". . . demumque abeuntibus in tubulos cylindricos distortos". According to Lloyd (1917: 740), "*Porotheleum lacerum* as named by Fries in Europe is the same as *Porotheleum fimbriatum*. Fries did not recognize the old (*Poria*) state." This disposition is now the one accepted by the few authors who mention *Porotheleum lacerum* at all.

American authors now also accept *Boletus pezizoides* as a synonym; following Lloyd (1917: 740), who stated "*Porotheleum pezizoides* as named by Schweinitz . . . [is] . . . based on the young, papillate condition." Fries thought it to be the same as his *Porotheleum lacerum*. Berkeley & Curtis (1856: 214) concluded that "this species differs from *P[orotheleum] fimbriatum* only in the absence of the marginal threadlike processes. There is a [specimen] in Hook. Herb. from Schweinitz marked *Boletus obliterated*."

Several other synonyms have been listed in connection with *Stromatoscypha fimbriatum*: *Fimbrillaria stellata* Sow., *Porotheleum friesii* Mont., *P. vaillantii* (DC. per Fr.) Quél., *Boletus tunicatus* Schum. These are discussed in a preceding chapter, section "Excluded species".

W. B. Cooke (1957: 684) lists also *Polyporus fatiscens* Berk. & Rav. apud Berk. as another synonym of *Porotheleum fimbriatum*. However, recently Lowe (1959: 103)

reports *Poria fatiscens* (Berk. & Rav. apud Berk.) Cooke as a true species of *Poria* (*sensu lato*, but exclusive of *Porothelium*) which is widely distributed in North America.

### 8.—*Cyphella* Donk, *gen. nov.*<sup>23</sup>

*Cyphella* subgen. *Glabrotricha* Pilát in Ann. mycol., Berl. 23: 148. 1925; in Publ. Fac. Sci. Univ. Charles No. 29: 30. 1925. — Type (selected): *Cyphella lactea* Bres.

Receptaculum plus minusve cupuliforme, basi rotundatum vel substipitiformi-attenuatum, extus album et subconspicue tomentosum, pilis patentibus basi fibulatis, inseptatis, filiformibus, capitatis, tenuiter usque firmule tunicatis indutum, margine in sicco haud involutum; hymenium subceraceum, laeve vel rugulosum saepiusque obscure radiato-plicatum; contextus monomiticus. Hyphae tenuiter tunicatae, fibulatae. Basidia clavata, sterigmatibus 2-4. Sporae ellipsoideae, plus minus claviformes, mediocres vel satis longae, hyalinae; paries laevis, haud amyloideus. — Typus: *Cyphella* sp. = C. Bas 1519 (L 958.140-484).

Fruit-body more or less cup-shaped, erect to pendulous, small (0.5-3 mm), sessile with rounded cup to spuriously short-stalked, white outside and rather conspicuously tomentose; margin not becoming inrolled; outside clothed with patent hairs with clamp-connections at the base, undivided, narrow, cylindrical, capitate, thin- to somewhat firm-walled; hymenium rather waxy, smooth to wrinkled and often even with folds radiating towards margin; context monomitic, of thin-walled, hyphae with clamp-connections. Basidia clavate, with 2-4 apical sterigmata. Spores ellipsoid and more or less club-shaped, medium-sized to rather long (10-18  $\mu$  long), colourless; wall smooth, non-amyloid.

On dead stalks, culms, twigs, bark.

TYPE SPECIES.—*Cyphella goldbachii* Weinm. (in the sense indicated below). Generic type specimen: C. Bas 1519 (L 958.140-484).

A very distinct and monotypic genus easily recognizable by the quite typical, capitate hairs at the outside of the cups. Its affinity is still doubtful, but I would rather suggest that it is mycenoid. Romagnesi (1950), who calls this fungus *Cyphella lactea*, likens the spores to those of *Omphalia* (Fr.) Kummer (restricted sense) and the hairs to those of *O. cephalotricha* Jossierand [= *Mycena cephalotricha* (Joss.) Kühner], a species classed by Kühner in *Mycena* sect. *Lacteae* Konr. & Maubl. = *Mycena* sect. *Candidae* Kühner = *Marasmiellus* sect. *Candidi* (Kühner) Sing. These 'pilo-cystidia', as described by Jossierand (1937: 86-87), are deflected ends of the hyphae of the flesh of the cap; they are very numerous, slender, very sinuous, 20-60  $\times$  3  $\mu$ , capitate by a well-defined, often somewhat flattened head of 5-6  $\mu$  in diameter. It may be that the likeness is only superficial. Clamp-connections are not mentioned in the description and are lacking at the base of the hairs drawn in the figure. *Omphalia cephalotricha* is a typical agaric in appearance: the fruit-body consists of a stalked cap with typical gills.

*Calyptella* lacks the coating of hairs (at least of such hairs that are sharply set off at their base), has a more waxy to tough-gelatinous context, a more typically trumpet-shaped fruit-body, and a distinct, constant stalk.

<sup>23</sup> An anagram of the name *Cyphella*.

***Cellypha goldbachii* (Weinm.) Donk, *comb. nov.***

? *Peziza cuticulosa* Dicks., Fasc. Pl. crypt. Brit. 3: 22 pl. 9 f. 11. 1793 (devalidated name). — *Peziza cuticulosa* Dicks. per Purt., App. Midl. Fl. 263. 1821; Pers., Mycol. europ. 1: 317. 1822; Fr., Syst. mycol. 2: 148. 1822 (nomen); 3 (Ind.): 130. 1832. — *Cyphella cuticulosa* (Dicks. per Purt.: Fr.) Berk. in J. E. Sm., Engl. Fl. 5 (2): 215. 1836. — *Chaetocypha cuticulosa* (Dicks. per Purt.: Fr.) O.K., Rev. Gen. Pl. 2: 847. 1891. — Type locality: Great Britain, Walthamston (B. M. Forster).

*Cyphella goldbachii* Weinm., Hym.- & Gastero-myc. ross. 522. 1836; Fr., Epicr. 569. 1838. — *Calyptella goldbachii* (Weinm.) Quél., Ench. Fung. 216. 1886.

*Cyphella ochroleuca* Berk. & Br. in Ann. Mag. nat. Hist. II 13: 405. 1854. — *Chaetocypha ochroleuca* (Berk. & Br.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Calyptella ochroleuca* (Berk. & Br.) Big. & Guill., Fl. Champ. sup. France, Compl. 483. 1913. — *Phaeocyphella ochroleuca* (Berk. & Br.) Rea, Brit. Bas. 704. 1922. — Type: Great Britain, Batheaston (Broome 179, K).

*Cyphella rubi* Fuck. in Jb. Nassau. Ver. Naturk. 23-24: 26. "1869" [1870]. — *Chaetocypha rubi* (Fuck.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Calyptella rubi* (Fuck.) Big. & Guill., Fl. Champ. sup. France, Compl. 483. 1913. — *Cyphella lactea* var. *rubi* (Fuck.) Pilát in Ann. mycol., Berl. 23: 149 f. 12 D-G. 1925; in Publ. Fac. Sci. Univ. Charles No. 29: 31 f. 11 D-G. 1925. — Type locality: Germany, Rheinland, near Eberbach.

*Cyphella caricina* Peck in Rep. New York St. Mus. 33: 22. 1880 (n.v.). — Type: U.S.A., New York, Verona (Peck, NYS).

*Cyphella dumetorum* Bomm. & Rouss., Fl. mycol. Bruxelles 88. 1884; Sacc., Syll. Fung. 6: 677. 1888. — *Chaetocypha dumetorum* (Bomm. & Rouss.) O.K., Rev. Gen. Pl. 2: 847. 1891. — Type locality: Belgium, near Brussels.

*Cyphella lactea* Bres., Fungi tridentini 1: 61 pl. 67 f. 2. 1884. — *Calyptella goldbachii* var. *lactea* (Bres.) Quél., Ench. Fung. 216. 1886. — *Chaetocypha lactea* (Bres.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Calyptella lactea* (Bres.) Big. & Guill., Fl. Champ. sup. France, Compl. 482. 1913. — Type locality: Italy, Trentino.

*Cyphella malbranchei* Pat., Tab. anal. Fung. 1: 204 f. 466. 1886; Malbranche in Bull. Soc. mycol. France 4: xxxii. 1888. — *Solenia malbranchei* (Pat.) Pat., Hym. Eur. text to pl. 3 f. 30 (figure of spores only, no reference, no description); Sacc. & Trav. in Sacc., Syll. Fung. 20: 803. 1911. — *Chaetocypha malbranchei* (Pat.) O.K., Rev. Gen. Pl. 2: 847. 1891. — Type locality: France, Normandy (Letendre, comm. Malbranche).

*Cyphella velenovskýi* Pilát in Ann. mycol., Berl. 22: 206. pl. 1 f. 13. 1924. — Monotype: Bohemia, near Budyně (O. Reisner).

MISAPPLICATION.—*Cyphella griseopallida* Weinm. *sensu* Fuck. in Jb. Nassau. Ver. Naturk. 25-26: 291. 1871.

DESCRIPTIONS & ILLUSTRATIONS.—Berkeley, Outl. Brit. Fung. 278. 1860 (*Cyphella goldbachii*); Patouillard, Tab. anal. Fung. 1: 204 f. 466. 1886, Malbranche in Bull. Soc. mycol. France 4: xxxii. 1888, Saccardo, Syll. Fung. 6: 676. 1888 (all as *Cyphella malbranchei*); Rea, Brit. Bas. 701. 1922, Bourdot & Galzin, Hym. France 157. 1928 (both as *Cyphella lactea*); Pilát in Ann. mycol., Berl. 23: 149 f. 12 D-G. 1925 (*Cyphella lactea* var. *rubi*); Overholts in Mycologia 26: pl. 54 f. 3. 1934 (*Cyphella caricina*); Reid in Trans. Brit. mycol. Soc. 38: 397. 1955 (*Cyphella lactea*) & 41: 438 f. 22. 1958 (*Cyphella ochroleuca*).

This species is well characterized by its usually sessile fruit-bodies generally connected by a white, fibrillose mycelium, clothed at the white outside with slender, capitate hairs, and by its long, more or less clavate spores. The latter vary considerably in length: usually they measure from 10–15  $\mu$  in length, but in one collection (France, Puy-de-Dôme, leg. Brevière) they reach as much as 14–18  $\mu$ .

Reid (1955: 397) describes the outside of the fruit-body thus: "From the outermost hyphae of the context, there arise others which are branched, septate, and clamped,

forming a loose tangled web. These give rise to certain branches that grow out to form characteristic clavate hairs, up to  $39\ \mu$  long, and  $2\ \mu$  wide, with swollen heads  $3\text{--}6\ \mu$  in diameter, which may or may not be septate, but if so these septa lack clamps, and are therefore secondary."

The following description is from the notes by Mr. C. Bas accompanying the specimen indicated above as ultimate type of the generic name (translated and adapted): Fruit-body crucible- to cup-shaped, originally disk-shaped, sessile,  $-1.5\ \text{mm}$  in diameter,  $-1\ \text{mm}$  high, white throughout, outside pubescent (capitate ends of the individual hairs visible at  $32\times$ ); margin at first incurved but even very young stages already with aperture. Spores  $12.4\text{--}13.5 \times 3.4\text{--}3.6\ \mu$  (inclusive of apiculus), slender, clavate with slightly curved base, non-amyloid. Basidia 4-spored,  $29\text{--}35 \times 7.2\text{--}7.9\ \mu$ , with basal clamp; sterigmata curved,  $-5.5\ \mu$  long. Hairs  $23\text{--}58\ \mu$  long, hypha-like, sinuous, occasionally somewhat granular-incrustated at the middle portion, colourless, with basal clamp, somewhat tapering up to the capitate end,  $3.0\text{--}3.6\ \mu$  in diameter at the base,  $2.2\text{--}2.5\ \mu$  in diameter halfway up; capitate end  $3.6\text{--}6.1\ \mu$  in diameter. Hyphae of context  $2.5\text{--}4\ \mu$  wide, rather thin-walled, colourless, with clamp connections. No positive reactions with Melzer's solution.

TYPE LOCALITY.—Russia.

SPECIMENS EXAMINED.—GERMANY, Oestricher Wald am Bachweg, on bark of *Lonicera xylosteum*, spring (Fuck., Fung. rhenani Exs. No. 2393, as *Cyphella griseopallida*; hb. Oud.-GRO); Leipzig, June, on culms and leaves of *Dactylis* (Auerswald, hb. J. Schroet.-BRSL, as *Cyphella goldbachii*); Niederwald near Rastatt, June (J. Schroet., hb. J. Schroet.-BRSL, as *Cyphella rubi*). CZECHOSLOVAKIA, Zwanovice, August, on twigs of *Rubus suberectus* (Pilát, as *Cyphella lactea* var. *rubi*, hb. Donk). BELGIUM, Malmédy, winter (Libert, Rel. Libert. II No. 458, distributed by Roum., Fung. gall. exs. No. 1410, as *Cyphella erucaeformis*, BP). FRANCE, Arlanc, Puy-de-Dôme, October, on *Baldingera arundinacea* (= *Phalaris arundinacea*) (L. Brevière, det. Patouillard as *Cyphella malbranchei*, PC); Beziers, March, on *Juncus maritimus* (A. de Crozals, hb. Boud.-PC, as *Cyphella malbranchei*). NETHERLANDS, Zuid-Holland, Leiden, Leidse Hout, on dead culms of *Holcus lanatus* (C. Bas 1519, L 958.140-484); Zeeland, Onrustpolder (W. G. Beeftink, L 958.339-093). GREAT BRITAIN, Norfolk, Horsey, on leaves of *Carex riparia* (Dennis, K, L 958.004-093). SWEDEN, Upland, Bondkyrka parish, on dead culms of *Glyceria altissima* and *Carex hudsonii* (Lundell, Lund. & Nannf., Fungi exs. succ. No. 1026), Halland, Onsala parish (L. Holm 194, Lund. & Nannf., Fungi exs. succ. No. 1423).

*Cellypha goldbachii* is noteworthy by the diversity of substrates on which it is found. Dead bramble twigs are a favourite host, but so are culms and leaves of several grasses, *Carex* spp., and so on; it may even be found on twigs and bark. This lack of preference is one of the reasons that it was repeatedly described as new, because Fries classified the species of *Cyphella* according to habitat.

Easily recognizable as it is, this species offers considerable difficulties in establishing its correct name.

Perhaps the first name given to the present fungus is *Peziza cuticulosa* Dicks., but all in all it should be concluded, I think, that Dickson's name is to be rejected as a nomen dubium. The original description is very brief, "acaulis cyathiformis membranacea alba, margine acuto". The accompanying figure depicts a species with fruit-bodies remarkably variable in shape, from cup-shaped with rounded base to truncate-clavate. The substratum is decayed grass. Berkeley & Broome (1854: 405)

rejected the name as the correct one for their *Cyphella goldbachii* because Dickson did not mention the existence of any indument, and we still have no indication of its existence.

The next two, simultaneously published, names to be seriously considered are *Cyphella goldbachii* and *C. griseopallida*. Both have been interpreted as representing the present species, but they have both also been applied to quite different fungi. Two of the species brought into connection with these names are:

(i) The present fungus: cups milk-white, externally villose with conspicuously capitate hairs; spores rather clavate, long (10–18  $\mu$ ).

(ii) Cups pale grey (or white in var. *alba*) finely pubescent; spores obovate, 5–7  $\times$  4–5 (or 5–7.5  $\times$  5.5–6  $\mu$  in var. *alba*). (I rely on Bourdot & Galzin, 1928: 158, as *C. griseopallida*, for details.)

If the fruit-bodies of these two species were described in the concise Friesian manner (and leaving out microscopical data), the resulting characterizations would become closely alike. The colour of the fruit-body and the nature of the indument would have to furnish the differentiating words.

Because the colour of *C. griseopallida* was originally described as “tota griseopallida”, and as “albida, intus pallida” in *C. goldbachii*, the former may be regarded as different from species (i) and as correctly interpreted by Bourdot & Galzin (l.c.), who so called species (ii). However, the name *C. griseopallida* has been applied by some authors to species (i) (Fuckel, 1871: 291), or used in an inclusive sense to comprise also species (i) (Quélet, 1886: 215).

*Cyphella goldbachii* was described as “extus villosa” against “extus floccosa” in *C. griseo-pallida*. I think that Berkely (Berkeley & Broome 1854: 405; Berkeley, 1860: 278) applied the former name correctly to species (i), but the evidence is slight (“villous coat”)<sup>24</sup>; by a note of exclamation Berkeley & Broome presumably indicated they had seen material sent by the originator of the name (Weinmann). Granting that the original diagnosis is poor and also that it takes a lot of goodwill to consider Berkeley’s interpretation as covering species (i), I yet venture to apply this name to the latter.

*Cyphella goldbachii* has been also differently interpreted: compare Patouillard (1883: 19 f. 33) and Quélet (1888: 26, as *Calyptislla*). Pilát (1925a: 158) thus calls a sterile fungus of which he states, “Haare zylindrisch, dicht mit Stäbchen von Kalziumoxalat inkrustiert, farblos, dünnwandig, einzellig, 4–5  $\mu$  dick, 100–150  $\mu$  lang.”

Fries (1838: 569) placed *Chaetocypha variabilis* Corda as a synonym under *Cyphella goldbachii*. Corda’s fungus is certainly quite unlike any of the species that have been called *C. goldbachii* and it is doubtful whether it is a basidiomycete at all (cf. Donk 1951: 208; see p. 40).

If one rejected the name *Cyphella goldbachii* as too uncertain for application, the next

<sup>24</sup> Berkeley & Broome remarked: “This is very near *C. cuticulosa*, from which it differs in its villous coat . . . almost visible to the naked eye.”

one to be taken into consideration is *C. ochroleuca*: "A pretty little species allied to *C. Goldbachii*."—Berkeley & Broome. The substratum ("dead leaves of *Aira caespitosa*" in *C. goldbachii*) seems to have been the decisive factor for separation. The original description (which lacks microscopical data) and the substratum ("decayed bramble twigs") agree well and I have little doubt that the fungus is the same as *C. goldbachii* as here interpreted. There is one complication to smooth out. Masee (1892: 143), who may be credited with studying the type, recorded the spores as "very pale ochraceous, elliptical,  $6 \times 4 \mu$ ", the reason why the species was transferred to *Phaeocyphella* by Rea (l.c.). However, it seems likely that Masee took the swollen tips of the hairs at the outside of the fruit-body as spores. The dimensions and shape agree and these swollen portions appear slightly yellowish under the microscope by their plasmatic contents. Recently Reid (1958: 439) re-examined the type and concluded that *Cyphella ochroleuca* is the correct name for *Cyphella lactea*.

A substratum on which this omnivorous species is often found is bramble twigs. Besides *Cyphella ochroleuca*, *C. rubi* is based on a collection growing on bramble twigs. The description leaves no doubt ("nivea, extus villosus, . . . speridiis obovato-clavatis").

When on another occasion Fuckel (1871: 291) collected this fungus "in den Rissen, alter, dürrer Rinde von *Lonicera Xylosteum*", he determined and distributed it as *Cyphella griseopallida*. He described the characteristic hairs (erroneously stating that he found them at the inner side) and the equally characteristic spores (ovoid-club-shaped,  $10-12 \times 4-6 \mu$ ). A sample of the distribution was studied and confirmed this conclusion.

It looks as if the present species is much rarer in North America than in Europe. American authors have not recorded it under any of the several European names. However, that it does occur there seems proven by the publication of *Cyphella caricina* Peck. Burt (1914: 366), when redescribing it, gave the spores as "lanceolate or subclavate, pointed at base,  $8-13 \times 4 \mu$ ". He also depicted them (op. cit., pl. 19 f. 8) and remarked that "the spores of the type are noteworthy by their tapering base". The very evident hairs (if I am correct in attributing this fungus to *C. goldbachii*) escaped him.

The description leaves no doubt that *Cyphella dumetorum* is another synonym; compare "Spores . . . obtuses au sommet, subaiguës à l'autre extrémité,  $12-15 [\times] 3,5$ ." It was found on "des sarment de ronce [*Rubus*] et des tiges desséchées d'*Urtica dioica*, sous des buissons épais".

Bresadola called the present species *Cyphella lactea*. His account (including the spores) and his picture remove all doubt about the identity. This name is the one at present most commonly used. Pilát (1925a: 149) made *C. rubi* a variety of *C. lactea*, stating that it is up to four times as large and has a strongly folded hymenium. A part of the one collection on which Pilát based his description could be examined and shows nothing unusual. Bresadola (1887: 104) defended his species a few years later by remarking that it differed from *C. goldbachii* by the differently shaped



(clavate) and twice larger spores. I have been unable to locate a description by Bresadola to find out what precisely he understood by *C. goldbachii*.

At the same time Bresadola referred *Cyphella malbranchei* Pat. to his *C. lactea*. In this case, too, the published original account is quite sufficient to accept this conclusion. Moreover, a specimen named by Patouillard himself could be studied and proved to be the present species.

The last contribution to the list of synonyms seems one by Pilát: *Cyphella velenovskyi*. The original description speaks of a stalked fruit-body (rather an unusual condition in *C. goldbachii*<sup>25</sup>) and of spores  $10-12 \times 2-3 \mu$ , "longe cylindraceis, saepe subcurvulis, apice paulum attenuatis, postice breviter in cuspidem plus minus contractis." Afterwards the author (Pilát, 1927: 117) also recorded sessile fruit-bodies from an additional collection and remarked about the spores that they were "immer sehr charakteristisch. Sie sind zylindrisch und  $9-12 \times 2.5-3.2 \mu$  gross", moreover emphasizing that the fruit-bodies are "fast kahl und nicht wie bei *Cyphella lactea* Bres. mit charakteristischen Haaren bekleidet. Nach meiner Meinung ist *Cyphella Velenovskyi* Pil. eine ziemlich gute Art, ob zwar sie mit *Cyphella lactea* Bres. sehr nahe verwandt ist." Again some years later he wrote to me that he then regarded it as a synonym of *C. lactea*: "Ist nur eine Form von *C. lactea* Bres. mit engeren Sporen." If this be true, I assume that the hairs were present after all, for otherwise the identity would be highly questionable.

#### 9.—*Pellidiscus* Donk, gen. nov.<sup>26</sup>

Receptaculum discoideum, margine elevato, centro affixum, minutum, album, tomentosum; hymenium pelliculare, subceraceum, laeve vel rugulosum, denique subochraceum; contextus monomiticus. Hyphae tenuiter tunicatae, haud fibulatae. Basidia clavata, sterigmatibus 2-4. Sporae ovoideo-ellipsoideae subamygdaliformes, mediocres, melleae sub microscopio; paries minute verruculosus, haud amyloideus. — Typus: *Cyphella pallida* Berk. & Br.

Fruit-body disk-shaped (when fresh or re-soaked), small (0.5-2 mm), loosely attached to substratum except for elevated margins, white outside; margin even or becoming crisped and lobed, the outside clothed with thin-walled, not encrusted, simple (rarely sparingly branched) hairs; hymenium lining the 'disk', pellicular and somewhat waxy, smooth to wrinkled (when fresh), becoming pale ochraceous; context poorly developed, floccose, monomitic. Hyphae thin-walled, without clamps. Basidia club-shaped, with 2-4 apical sterigmata. Spores ovoid-ellipsoid, medium-sized (about  $7 \mu$  long), appearing pale honey-coloured under the microscope; wall minutely warted (use high magnification), non-amyloid.

Epixylous, or on dead herbs and leaves.

TYPE SPECIES.—*Cyphella pallida* Berk. & Br.

The only species included in this genus originally impressed me as having fruit-bodies very much like those of *Athelia* Pers. (for instance *A. epiphylla* Pers.; cf. Donk, 1957b: 12) except that they were not indeterminate but clearly marginate, in short,

<sup>25</sup> Pilát (1924: pl. 1 f. 9) figures both sessile and substipitate fruit-bodies for *Cyphella lactea*.

<sup>26</sup> From Lat. *pellis*, thin skin, an allusion to *Corticium* sect. *Pellicularia* Bourd. & G.; and Lat. *discus*, quoit.

as a discoid species of that genus. More careful and repeated examination brought to light a series of features quite inconsistent with the first impression. It was found not only that the spores were faintly (but undeniably) coloured, but also that their surface was punctate and their shape of a peculiar variability. The combination of these features is very suggestive and I now incline to the view that *Pellidiscus* is perhaps a genus with 'reduced' fruit-bodies very close to *Crepidotus* (Fr.) Staudé.

Romagnesi (1950) had the present genus in mind when he mentioned as examples of "Agarics cyphelloides" two species as follows: "*C[ypbella] Bloxami* et *albina*: spore verruculeuse, jaune une fois collapsée, hyphes sans boucles, poils subulés cf. *Pleurotellus pubescens*." It may be that '*albina*' is an error for '*pallida*'. His more elaborate account runs thus:—

"[Chez le] groupe de *Cypbella Bloxami* Pilát (= *C. ciliata* Fr. sensu Bourdot-Galzin), une autre affinité se révèle: la spore de cette espèce, et d'une forme lignicole très voisine, un peu plus grande, recueillie par nous sur l'écorce de *Salix* sp., se montre finement verruqueuse; lorsqu'elle se collapse et se vide de son contenu, elle prend une couleur jaune d'or, et rappelle de façon frappante celle d'une petite Pleurotacée, *Dochmiopus* [= *Crepidotus*] *pubescens* ss. Schröter; cette parenté est confirmée par l'absence de boucles aux cloisons des hyphes, et surtout par la quasi insensibilité de leur paroi au Bleu de Crésyl . . ."—Romagnesi (1953: 409).

The 'hairs' from the marginal region (as described for the species) look very much like sterile bunches of basidia of which each 'basidium' develops an apical hyphal outgrowth. I would assume that by continued marginal growth of the fruit-body these hairs become displaced towards the sterile side of the fruit-body: this would imply that that side is covered by a trichoderm or, if one wishes to call it so, a hymenoderm, depending on the stress one lays on the swollen basal portions of the hairs. The very young fruit-bodies are attached by a point, but gradually, when the cup-shaped fruit-body turns into a more disk-shaped one, they become more broadly and loosely attached to the substratum. The question now arises if it could not be the hairs that grow out and loosely connects the outside of the fruit-body with the substratum.

*Cypbella fraxinicola* Berk. & Br. should be carefully compared with *Pellidiscus*. It has also brownish spores and small, white, disk-shaped fruit-bodies; but it differs in several points. It has recently been well described by Reid (1958: 439). I intend to return to it in a subsequent part of the present series.

#### ***Pellidiscus pallidus* (Berk. & Br.) Donk, comb. nov.**

*Cypbella pallida* Berk. & Br. in Rab., Fung. europ. exs. No. 1415. 1871; in Ann. Mag. nat. Hist. IV 11: 343. 1873. — *Chaetocypha pallida* (Berk. & Br.) O.K., Rev. Gen. Pl. 2: 847. 1891.

*Cypbella bloxami* Berk. & Phill. apud Berk. & Br. in Ann. Mag. nat. Hist. V 7: 129. 1881. — *Chaetocypha bloxami* (Berk. & Br.) O.K., Rev. Gen. Pl. 2: 847. 1891. — Type: Great Britain, Twycross (A. Bloxam, K).

*Cypbella disciformis* Pilát in Ann. mycol., Berl. 22: 212 pl. 1 f. 18. 1924; not *Cypbella disciformis* P. Henn. in Bot. Jb. 22: 85. 1895. — *Cypbella bloxami* var. *disciformis* (Pilát) Pilát in Publ. Fac. Sci. Univ. Charles No. 29: 34. 1925. — Type locality: Central Bohemia, Mnichovice.

*Cypbella involuta* Pilát in Ann. mycol., Berl. 23: 151 f. 6. 1925; in Publ. Fac. Sci. Univ. Charles No. 29: 34 f. 7 b. 1925. — Type locality: Bohemia.

MISAPPLICATION.—*Cypbella ciliata* Saut. sensu Bourd. & G., Hym. France 161. 1928.

DESCRIPTIONS & ILLUSTRATIONS.—Pilát in Ann. mycol., Berl. 22: 212 pl. 1 f. 18. 1924 (*Cyphella disciformis*); in Ann. mycol., Berl. 22: 212 pl. 1 f. 12a, b. 1924 (*Cyphella bloxami*); Bourdot & Galzin, Hym. France 161. 1928 (*Cyphella ciliata*).

Fruit-body initially cup-shaped, soon disk-shaped with upturned margin, orbicular, often becoming crenulate to lobed and crisped at margin, usually about 1–2 mm in diameter, sometimes bigger, scattered or somewhat crowded, rarely a few imperfectly confluent, evenly thin throughout except the slightly thicker margin; inside even, smooth to wrinkled, from snow-white soon becoming pale yellowish-brown, of somewhat waxy appearance; outside white, minutely tomentose; texture comparable with that in *Athelia* Pers. Hyphae hyaline, not encrusted, thin-walled, rather loosely interwoven towards outside, 2.5–4  $\mu$  in diameter, without clamp-connections. Marginal hairs (close to marginal basidia) in clumps, with swollen bases and long drawn-out thinner portions which may be branched; tips obtuse; not encrusted. Hymenium non-thickening. Basidia short-clavate, plump, 12–19  $\times$  4.5–6  $\mu$ , with (2–)4 sterigmata. Spores ellipsoid, rather elongate, often slightly amygdaliform, 6.5–9  $\times$  3.5–5.5  $\mu$ , faintly yellowish; walls minutely but distinctly roughened by punctations, non-amyloid.

On rotten bark and wood, old woody stems and fallen branches, dead herbaceous stalks, and also on rotten leaves of frondose trees. Apparently the whole year through. Europe; ? North America.

TYPE DISTRIBUTION.—Rab., Fung. europ. exs. No. 1415.

SPECIMENS EXAMINED.—GREAT BRITAIN, Batheaston, on twigs of *Clematis vitalba* (Broome; Rab., Fung. europ. exs. No. 1415; type-distribution). FRANCE, Allier, near St.-Priest-en-Murat, on rotten leaves of walnut tree (Bourd., hb. Bourd. 4725); St.-Priest-en-Murat, on oak leaves (Bourd., hb. Bourd. 4091). NETHERLANDS, Noord-Holland, 's Gravenland, Gooilust (J. Daams, L 956.312–243).

This is a very easily recognizable fungus on account of its flattened, broadly but loosely adnate fruit-bodies, with only the margin upturned and incurved (when dry). Vigorously growing fruit-bodies may become attractively crisped-lobed by proliferation along their margin. The microscopical features seem not very variable, although this would not appear from literature. The spores appear very pale coloured under the microscope and minutely but unmistakably roughened.

*Cyphella pallida* may be recognized from the authentic material distributed by Rabenhorst.

The description of *Cyphella bloxami* is sufficient to justify the conclusion that it is identical with *C. pallida*. The same applies to Pilát's interpretation of *C. bloxami*. It is true that that author indicated the spores as 3  $\times$  5  $\mu$ , which is too small. However, some error crept in on this occasion, for, according to the accompanying figure, the spores still attached to the basidia measure about 9  $\mu$  and the separately drawn spores about 6.5–7  $\mu$ , when one computes them after the magnification indicated. When Pilát (1927: 117) concluded that the two were conspecific (after the study of the type of *C. pallida*), he incorrectly continued to apply the later synonym as the correct name.<sup>27</sup>

There seems also little room left for doubt that *Cyphella disciformis* is this species. Its

<sup>27</sup> Due, it would seem, to the number (No. 1894) of the species in Berkeley & Broome "Notes" being taken for the date.

author regarded it as close to *C. bloxami*, but smaller, subarchnoid, and with the margin neither lobate nor crisped. Like *C. involuta* this can hardly be anything else but a not very vigorously developed growth form. The crenulation of the margins often—but not invariably—occurs in mature specimens and it seems unnecessary to keep *C. disciformis* distinct even as a variety on account of the even margin, as was done by Pilát (under *C. bloxami*).

From Pilát's description I cannot see any differences between *Cyphella involuta* and *C. pallida* either. In his French key Pilát (1925c: 82) emphasized "Les réceptacles régulièrement ronds [thus, as in *C. disciformis*]. Le bord incurvée dedans.", to differentiate it from *C. bloxami*. This is precisely what one finds in certain conditions of *C. pallida* and in Pilát's *C. disciformis* as well. Compare Pilát (1924: 212) for *C. disciformis*: "... margine solum involuto," and for *C. involuta* itself (1925a: 151) "... margine primo involuto, dein fere plano".

The very good description as well as the specimens in Bourdot's herbarium which I had the opportunity to study, show that Bourdot & Galzin's interpretation of *Cyphella ciliata* Saut. covers a small, regular form growing on fallen frondose leaves.

*Corticium pezizoideum* Ell. & Ev.,<sup>28</sup> described from the U.S.A., I know only from the original description which strongly suggests the present species except for the spores (globular, 2  $\mu$  in diameter, according to Saccardo, 1891: 230). Rogers & Jackson (1943: 286) cite it as a synonym of '*Corticium centrifugum* (Lév.) Bres.' (= *Athelia epiphylla* Pers.). They indicate they had studied the type collection, but give no details. This warrants the conclusion that the spores were incorrectly described in the original description and resemble those of one of the numerous forms which they include in '*Corticium centrifugum*'. Since *Pellidiscus pallidus* does suggest orbicular fruit-bodies of *Athelia epiphylla* I wonder if *Corticium pezizoideum* might not be the present species.

I would not be surprised if *Cyphella sarothamni* Pilát (1925a: 149 f. 4 A-D) and *C. lloydiana* Pilát (1925a: 150 f. 4 E-H) were further synonyms.

The occurrence of such different substrata as are indicated above for *Pellidiscus pallidus* perhaps indicate that more than one species is involved. Romagnesi's quoted remark suggests the same. However, the available material is insufficient to decide the question but it certainly does not readily support such an assumption.

#### 10.—CHROMOCYPHELLA De Toni & Levi

*Cymbella* Pat. apud Doass. & Pat. in Rev. mycol. 8: 27. 1886; not *Cymbella* C. Agardh (1830; Cymbellaceae, Bacillariophyceae). — Monotype: *Cymbella crouani* Pat. & Doass.

*Phaeocarpus* Pat., Hym. Eur. 154. 1887; not *Phaeocarpus* Mart. & Zucc. (1824; Sapindaceae);  $\equiv$  *Cymbella* Pat. apud Pat. & Doass.

*Chromocypbella* De Toni & Levi in Naturalist 1888: 158  $\equiv$  *Cymbella* Pat. apud Doass. & Pat.

<sup>28</sup> *Corticium pezizoideum* Ell. & Ev. in J. Mycol. 4: 74. 1888 (n.v.); not *C. pezizoides* Pat. in J. Bot. (ed. Morot), Paris 5: 314. 1891; not *C. pezizoideum* (Schw.) Schrenck in Bull. Torrey bot. Cl. 21: 288. 1894.

*Phaeocyphella* Pat. in Bull. Soc. mycol. France 9: 135. 1893 (nomen nudum); Essai taxon. Hym. 57. 1900; not *Phaeocyphella* Speg. (1909; 'Cyphellaceae'); ≡ *Cymbella* Pat. apud Doass. & Pat.

? *Phaeocyphella* Speg. in An. Mus. nac. Hist. nat. Buenos Aires 19 (= III 12): 278. 1909; not *Phaeocyphella* Pat. (1900; 'Cyphellaceae'). — Monotype: *Phaeocyphella sphaerospora* Speg.

Fruit-body solitary, cup- to disk-shaped (–3 mm in diameter), abruptly contracted into a stalk-like base, or sessile; outside white to pale, minutely silky-pubescent (from rather undifferentiated hyphae); margin straight, not typically incurved when dry; inside even to wrinkled, white, becoming dusted cinnamon- to reddish brown by the spores. Hyphae radially arranged, looser towards outside, compactly arranged towards inside, thin-walled; clamp-connections present. Basidia when young elongated ovoid or pear-shaped, when mature cylindrical-club-shaped with stalk-like base, medium-sized (20–25  $\mu$  long); sterigmata 4, conical, curved, rather stout (–10  $\mu$  long). Spores globular (at first broad-ellipsoid, often somewhat irregular in outline), medium-sized (7–10  $\mu$  in diameter), reddish brown; wall coloured, asperulate to minutely spiny, non-amyloid.

On mosses on bark. Temperate northern regions; perhaps also elsewhere (South America, Java).

MONOTYPE.—*Cymbella crouani* Pat. & Doass. apud Pat.

EXAMPLES.—*Chromocyphella muscicola* (Fr.) Donk, *Phaeocarpus floccosus* Maire, *Phaeocyphella sphaerospora* Speg.

The muscicolous fruit-body and the distinctly coloured and at the same time roughened and nearly globular spores sharply characterize this genus. Perhaps the basidia offer an additional feature of importance in being obovoid-ellipsoid to pear-shaped when young and notably elongating when reaching maturity in the one species studied. The outside of the fruit-body does not bear typical 'hairs'.

By the characters of the spores, *Chromocyphella* is easily distinguished from another muscicolous genus, *Leptotus* P. Karst. *sensu stricto* = *Leptoglossum* P. Karst. in part. In the latter genus the spores (wall or oil-drop) may be faintly tinged yellowish or brownish, but their colour is much less pronounced (spore-powder not distinctly coloured) and their surface smooth. Moreover the basidia in *Leptotus* show nothing unusual and are club-shaped when young, retaining their shape upon further development. I do not have the impression that the two genera are closely related.

*Chromocyphella* (*Phaeocyphella*) has become a receptacle for species of 'Cyphellaceae' with coloured spores, without regard to other features. Patouillard (1900: 57) set the example in this respect. Others transferred additional species to the genus, even if the colour of the spores was very faint. The components that in this way drifted into the genus formed a very heterogeneous collection. Some of these are congeneric with *Cyphella endophila* Ces., and if in its turn this species is congeneric with *Phaeosolenia platensis* Speg. (as I suspect from the description) then this group may be set apart under the generic name *Phaeosolenia* Speg. Such a genus would differ from *Chromocyphella* in a restricted sense by its characteristic hairs at the outside (patent, rather short, heavily encrusted by easily detersile crystals of lime-oxalate) and the more elongate, smooth, somewhat thick-walled spores. Still other species are referable to *Leptotus* (*Leptoglossum*), *Pellidiscus* Donk (see p. 89), or have no suitable described genus to receive them (*Cyphella fraxinicola* Berk. & Br.).

The colour of the spores, which appears an important generic feature in both *Chromocyphella* and *Phaeosolenia* (in the above sense), does not mean much in some other genera of the 'Cyphellaceae'. This is particularly true for *Cyphellopsis* [type species, *Solenia anomala* (Pers. per Fr.) Fuck.]. In that genus all shades are represented between rather distinctly brown-coloured to strictly colourless spores.<sup>29</sup> Some species of the *Leptotus* complex have just sufficiently coloured spores to account for their transfer to *Chromocyphella*. Emphasis on the colour of the spores alone has proven to be conducive to artificial genera in the 'Cyphellaceae'.

Romagnesi (1950) compared the spores of this genus with those of *Galerina* Earle [*Galera* (Fr.) Kummer *pro parte*]: "périspore, verrues, plage hilare limitée, couleur rouille par ammoniaque".

In the more elaborate paper on the same subject the following remarks appear: —

"... Nous n'avons malheureusement recueilli vivante aucune espèce [du genre *Phaeocyphella*], mais les exemplaires qui figurent dans l'Herbier Bourdot sous le nom de *Phaeocyphella muscicola* (Fr.) sensu Rea (det. C. Cool, leg. Schweers) et *Ph. muscigena* Fr., nous ont montré des spores fort semblables à celles des *Galerina* par leur couleur jaune un peu rouillé (surtout dans l'ammoniaque, mais la réaction n'est pas aussi nette que chez les dernières), leur périspore membraneuse recouvrant des verrues obtuses probablement épisporiques, leur plage supra-hilare nettement limitée et nue, ou moins ornée, leur endospore très nettement colorée. Or, ces caractères, ou plus précisément leur conjonction, sont particuliers aux Agaricales, et ne se retrouvent chez aucune Aphyllophorale, du moins à notre connaissance; ils sont au contraire courants chez de nombreuses Naucoriacées, et permettent donc d'envisager certains rapports entre *Phaeocyphella* et Agarics chromosporés. En outre, l'habitat muscicole de *Ph. muscigena* se retrouve chez un nombre important de *Galerina*."—Romagnesi (1953: 409–410).<sup>31</sup>

This is a very interesting suggestion indeed which seems also supported by the shape of the basidia as indicated above and by the association with mosses. If Romagnesi's suggestion proves to be acceptable, one will hardly be able to imagine two more dissimilar but related genera than *Galerina* and *Chromocyphella*. It would also be in line with my contention that *Leptotus* is widely different, it being related to another series of agarics.

The genus was founded for a single species which is still its best known member, viz. for *Cyphella abieticola* Crouan = *Cymbella crouani* Pat. & Doass. = *Cyphella muscicola* Fr. as I interpret that species (see below). The original name *Cymbella* appeared to be pre-empted and it was therefore changed by Patouillard into *Phaeocarpus* (also preoccupied) and *Phaeocyphella*. The latter name is the one now in use but it is incorrect because of an earlier synonymy, *Chromocyphella* (cf. Donk, 1951: 209). For some time the nomenclatorial Rules forced Maire (1917: 154) to consider *Phaeocarpus* Pat. as the correct name because its earlier hononym was considered a synonym.

<sup>29</sup> As found in spores that have remained on the disk rather than in spore-prints.

<sup>30</sup> In a collection from Java which I consider to belong to *Chromocyphella*, but in which the fruit-bodies do not yield any distinct basidia (although there are copious spores), I found that in quite a number of the spores an indistinct germ-pore was present (of the kind also seen in many species of *Galerina*).

**Chromocyphella muscicola** (Fr.) Donk, *comb. nov.*

*Cyphella muscicola* Fr., Syst. mycol. 2: 202. 1822, exclusive of varieties. — *Calyptella muscicola* (Fr.) Quél., Ench. Fung. 217. 1886. — *Arrhenia muscicola* (Fr.) Quél., Fl. mycol. France 33. 1888. — *Chaetocypha muscicola* (Fr.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Phaeocyphella muscicola* (Fr.) Rea, Brit. Bas. 704. 1922.

? *Cantharellus tenuissimus* Saut. in Flora, Jena 24 (1): 317. 1841. — *Cyphella tenuissima* (Saut.) Saut. ("in litt."), Rab., Krypt.-Fl. 1: 315, 1844 (as a synonym); Saut. in Mitt. Ver. salzburg. Landesk. 6: 44. 1866 (n.v.), — Type locality: Austria, Salzburg, Ober-Pinzgau, near Mittersill.

*Cyphella abieticola* Crouan, Fl. Finist. 61. 1867; not *C. abieticola* P. Karst., Fungi Fenn. exs. No. 718. 1868. — Type locality: France, Finistère.

*Cymbella crouani* Pat. & Doass. *apud* Doass. & Pat. in Rev. mycol. 8: 27. Jan. 1, 1886 (nomen nudum); *apud* Pat., Tab. anal. Fung. 1: 204 f. 467. 1886. — *Phaeocarpus crouanii* (Pat. & Doass. *apud* Pat.) Pat., Hym. Eur. 154. 1887 (without reference or description). — *Cyphella crouanii* (Pat. & Doass. *apud* Pat.) Sacc., Syll. Fung. 6: 672. 1888. — *Chaetocypha crouanii* (Pat. & Doass. *apud* Pat.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Phaeocyphella crouanii* (Pat. & Doass. *apud* Pat.) Pat., Essai taxon. Hym. 58. 1900. — *Calyptella crouanii* (Pat. & Doass. *apud* Pat.) Big. & Guill., Fl. Champ. sup. France, Compl. 481. 1913 ≡ *Cyphella abieticola* Crouan.

*Cyphella fuscospora* Currey ("in Herb.") *ex* Cooke in Grevillea 20: 9. 1891. — *Phaeocyphella fuscospora* (Currey *ex* Cooke) Rea, Brit. Bas. 704. 1922. — Type locality: Great Britain, Weybridge.

Misapplications.—*Cantharellus galeatus* (Schum.) *per* Fr. *sensu* Fr., Epicr. 567. 1838 (*Cyphella*); Quél., Fl. mycol. France 33. 1888 (*Arrhenia*); Bourd. & G. in Bull. Soc. mycol. France 26: 227. 1910 (*Phaeocyphella*).

DESCRIPTIONS & ILLUSTRATIONS.—Patouillard, Tab. anal. Fung. 1: 204 f. 467. 1886 (*Cymbella crouanii*); Bourdot & Galzin in Bull. Soc. mycol. France 26: 227. 1910 & Hym. France 165. 1928 (*Phaeocyphella galeata*); Burt in Ann. Missouri bot. Gdn 1: 362. 1914 & 13: 316. 1926 (*Cyphella galeata*); Donk in Meded. Nederl. mycol. Ver. 18–20: 132. 1931 (*Phaeocyphella galeata*).

TYPE LOCALITY.—Sweden.

*Cyphella muscicola* Fr. has been diversely interpreted. However, the original description is (except for the lack of microscopical details) ample for its time and quite sufficient, I believe, to conclude that the name covers the fungus now often called *Cyphella galeata* (Schum. *per* Fr.) Fr. and *Cymbella crouani*. (For the latter species the generic name *Cymbella*, ≡ *Chromocyphella*, was introduced.) Especially the words, "Intus e sporidiis brunneis, leviter pruinosa. Nascitur ad muscos vivos supra arborum truncos vetustos" appear decisive. They indicate, for instance, that *Cyphella muscicola* is quite distinctly brown-spored, and that the species is associated in the first place with bark-inhabiting mosses. They exclude convincingly the species of *Leptotus* to which the name *Cyphella muscicola* has sometimes been applied, for instance, by Fries himself in 1838: the spores of these species, which, moreover, prefer bigger and terrestrial mosses, are too faintly coloured for Fries to have been able to see with a handlens as a brown powder.

This conclusion excludes, *inter alia*, the following species of *Leptoglossum* (*Leptotus*) to which the name *Cyphella muscicola* has been misapplied. They are smooth-spored.

(i) *Sensu* Patouillard, Tab. anal. Fung. 1: 19 f. 31. 1883; Bourdot in Bull. Soc. mycol. France 48: 209. 1932 (*Phaeocyphella*); Donk in Meded. Nederl. mycol. Ver.

18-20: 131. 1931 (*Cyphella*), with almost globular, rather small spores ( $4.5-6 \times 4-5 \mu$ ).

(ii) *Sensu* Pilát in Ann. mycol., Berl. 23: 163 f. 16. 1925 (*Phaeocyphella*), with more definitely ovoid and bigger spores ( $8-9 \times 5.5-6 \mu$ ).

(iii) *Leptoglossum* (*Leptotus*) *retirugum* (Bull. per Fr.) P. Karst.

The specific delimitations between these three fungi have not yet been satisfactorily worked out.

The description of *Cantharellus tenuissimus* suggests the present species rather than one of these species of *Leptoglossum* with only faintly coloured spores: “. . . intus brunnescens . . . innen zuerst grau, dann braun.” The other details bear out this assumption, but Sauter’s account is too poor to be decisive. There is no type preserved (cf. von Keissler, 1917: 107).

*Cyphella abieticola* Crouan is readily recognizable from the original account. The name was changed by Patouillard into *Cymbella crouani* because of the existence of a homonym—of later date. The description of *C. abieticola* is rather good for its time and states, *inter alia*, “. . . hymenium ochracé formé par des basides claviformes, stérigmates longs, spores rondes ochracées granuleuses . . .” Patouillard’s description and figure, too, leave no doubt about the identity of the fungus he had in mind, a conclusion that has been verified by a study of his specimens, of which he wrote, “spores sphériques ( $7-9 \times 6$ ) finement échinulées, ocracées-rousses”.

Another name that may be listed as a synonym, on the basis of the original description, is *Cyphella fuscospora*: “sporulis fuscis, subglobosis vel subellipticis, punctulatis vel granulato-echinulatis ( $8-10 \mu$  long.)” Yet, it should be pointed out that the fruit-bodies are very small in this case, 0.20–0.25 mm, thus of about the same dimensions as indicated for *Cyphella chromospora* Pat. (which I do not know).

*Phaeocyphella muscicola* (Fr.) Rea *sensu* Rea, Brit. Bas. 704. 1922 offers some difficulties. The description of the outer features corresponds closely to Fries’s description, which may have been adapted and then amplified with, “Hymenium white then grey . . . Spores pinkish, or pale brown, subglobose,  $8-10 \mu$ .” It is possible that Rea described another species of *Chromocyphella* but it may also be that the microscopical details added were taken from a young fruit-body in which the spores were not yet plentiful and not completely matured, the colour being paler and the walls probably still smooth.

In this connection it should be pointed out that Romagnesi (1950) distinguishes between two species, viz. (i) “*Phaeocyphella muscicola* ss. Rea: spore de *Galerina* (périspore, verrues, plage hilaire limitée, couleur rouille par ammoniacque)” and “*Phaeocyphella galeata*: même spore, mais ronde.” One would conclude that the first of these has more or less ellipsoid spores, which, however, hardly agrees with Rea’s description. I have studied several collections of the present genus from Europe but invariably found the spores not exactly globular but varying from globular to short-ellipsoid on the same fruit-body.

For other species that might or might not be different from *Chromocyphella muscicola*, see below.



*Chromocyphella muscicola* has often been identified with *Cyphella galeata* (Schum. per Fr.) Fr. (*Cantharellus galeatus* Schum.) In the absence of type material this fungus must be interpreted only from its original description and later published corresponding figure. From the description it emerges as a somewhat smaller fungus than fully developed *Leptoglossum* (*Leptotus*) *retirugum*, with the hymenial surface obsoletely veined radially and presumably without cross-veins. The picture that represents the type (Flora danica, *pl.* 2027 f. 1; reproduced by Burt, 1914: *pl.* 19 f. 2) strongly supports the thesis that it belongs to *Leptoglossum* (*Leptotus*). What the correct application of the name may be will not now be discussed, but one conclusion is certain, in my opinion: *Cyphella galeata* does not belong to *Chromocyphella*. Confusion with the latter genus started when Fries (1838: 567) thought he had found the species himself and ascribed to it a hymenium which turns brown. This has been interpreted as indicative of brown spores and resulted in the identification with *Chromocyphella muscicola* by certain authors (Quélet, Bresadola, Bourdot & Galzin, Burt, and others).

#### Other species of *Chromocyphella*

*Chromocyphella muscicola* is the only more generally known species of the genus. Yet it seems that there may be a few more: they are recognizable from their descriptions as apparently closely related, and may be conspecific.

*Phaeocarpus floccosus* Maire in Bull. Soc. Hist. nat. Afr. Nord 8: 154. 1917. — Type locality: "Mauretania".

The original description suggests a species related to, but distinct from, *Chromocyphella muscicola*, of smaller size (0.3–0.8 mm in diameter); with smaller basidia (14–17 × 5–5.5  $\mu$ ); and spores, "ellipsoidales-pruniformes, subapiculées à la base, couleur de miel sous le microscope, verruqueuses, 6–7 × 3–5  $\mu$ ", thus of different shape and size.

*Phaeocyphella sphaerospora* Speg. in An. Mus. nac. Hist. nat. Buenos Aires 19: 278. 1909. — Type locality: Argentine, Santa Catalina near Buenos Aires.

The rather ample description agrees on the whole with *Chromocyphella muscicola*; however, the hairs at the outside are stated to be minute, 25–75 × 5  $\mu$ , and the sterigmata, to be short.

#### 11.—LACHNELLA Fr. emend.

*Lachnella* Fr., Fl. scan. 343. 1835; cf. Sing. in Lilloa 22: 343. "1949" [1951]. — *Chaetocalathus* sect. *Lachnella* (Fr.) Locq. in Bull. Soc. mycol. France 68: 165. 1952.

*Lachnium* Clem. in Univ. Stud. Nebraska 3 (1): 73. 1902 (nomen nudum); not *Lachnium* Retz. per P. Karst. 1871 (Hyaloscyphaceae, Ascomycetes); = *Lachnella* Fr.

*Cyphella* subgen. *Crustotricha* Pilát in Ann. mycol., Berl. 23: 152. 1925; in Publ. Fac. Sci. Univ. Charles, Prague No. 29: 43. 1925. — Type (selected): *Cyphella alboviolascens* (A. & S. per Pers.: Fr.) Crouan.

Fruit-bodies scattered, often gregarious but not crowded over considerable areas, sessile (slightly contracted at base), centrally attached, 1–2 mm in diameter; cup-shaped, when dry globular to pear-shaped, not or hardly longer than wide; margin inrolled and mouth (nearly) closed when dry; inside even, cream- or brightly coloured; outside silky by a coating of appressed hairs, white. Substance thin-membranous, thickest at centre (disk from concave to almost flattened), tough, somewhat fleshy at inside (which may dry hard). Hairs appressed, cylindrical, with blunt tip, asperulate, not septate, colourless, rather thick-walled; in KOH solution becoming very thick-walled with narrow lumen at least below, often deformed over short to considerable stretches (swollen, very transparent, surface smooth because of fading asperulation, lumen thread-like or disappearing); somewhat pseudo-amyloid. Spindle-shaped ‘basidioles’ may be present. Basidia rather large (40–75  $\mu$  long), in one species (*L. tiliae*) at centre of fruit-body even very long-drawn towards base (175  $\mu$  long); sterigmata 2–4, conical, curved, rather stout (about  $10 \times 3$ –4.5  $\mu$ ). Spores obovate, ellipsoid, swollen below middle (usually somewhat triangular in outline), adaxially flattened, rather large (10–20  $\mu$  long), colourless; wall smooth, non-amyloid.

On branches and herbs. Northern & southern temperate zones, apparently rare in the tropics.

HOLOTYPE.—*Peziza alboviolascens* A. & S. per Pers.: Fr. — Cf. Donk (1951: 212).

EXAMPLES.—*Lachnella alboviolascens* (A. & S. per Pers.) Fr., *L. villosa* (Pers. per Fr.) Gillet, *L. tiliae* (Peck) Donk apud Sing.

The hairs have a roughened surface by some kind of innate incrustation (rather than by detersile lime-oxalate crystals) and become more or less notably altered in KOH solution: the walls become thicker, often leaving only a capillary lumen, and at irregular places excessively swollen. In these strongly deformed parts, the surface asperulation has disappeared and the lumen has become either a mere thread or usually has vanished completely. This type of deformation I did not come across in any other group of ‘Cypellaceae’, except to a much slighter degree in *Cyphella jucundissima* (Desm.) Höhn., which I believe to form an independent genus.

In the above circumscription *Lachnella* is a clear-cut genus easily recognized among the ‘Cypellaceae’ by the combination of the following characters: hairs appressed, with innate asperulation, more or less thick-walled, colourless and remaining colourless in KOH solution in which the walls become thicker and considerable portions become swollen and deformed; hymenial elements big, spores 10–20  $\mu$  long; spores more or less typically widest below middle. *Cyphellopsis* [type species, *Solenia anomala* (Pers. per Fr.) Fuck.] agrees in many respects. At first (and before being aware of the correct application of the name *Lachnella*), I combined the *Solenia anomala* group and the *Cyphella alboviolascens* group into the single genus *Cyphellopsis*, but soon concluded that *Cyphellopsis* may be kept apart generically because of the colour of the hairs (brown and somewhat darkening in KOH solution) and the fact that these hairs undergo neither any considerable transformation nor deformation in KOH solution. There is one species of *Cyphellopsis* that shares with *Lachnella* the big basidia and spores. For the present I still believe the two genera as closely related.

When I told Dr. R. Singer in 1946 that I was thinking of a close relation between *Lachnella* and *Chaetocalathus* Sing. and *Crinipellis* Pat., he at once convinced himself

that the hairs in *Lachnella* were also pseudo-amyloid as in the two other genera, a condition he had described on a previous occasion as follows:—

“... the hairs ... are colorable with iodine (Melzer's reagent), where they turn dark rufous-bay, or sometimes almost violet (the latter reaction being very close to 'amyloid'). It is very important for a satisfactory effect to treat the preparations previously with ammonia. The pseudoamyloid to almost amyloid hairs are found only in *Crinipellis* and *Chaetocalathus*. Beside, those hairs are mostly very long without any septa, and even if they are septate they are not or only exceptionally constricted at the septa.”—Singer (1942: 444).

The same conclusion was reached by Romagnesi:—

“Chez *Cyphella villosa* ... les poils extérieurs de la cupule ... sont puissamment métachromatiques, et il suffit d'une infime quantité de Bleu de Crésyl dissous dans l'eau pour les voir devenir d'un rouge intense et franc (à la lumière du jour): la coloration prise est si vive qu'elle résiste même très longtemps à l'action de l'ammoniaque! En outre, après lavage à l'ammoniaque, ils se montrent faiblement, mais incontestablement pseudo-amyloïde, et, par ces deux caractères, ils se rapprochent donc beaucoup de ceux des *Chaetocalathus* (surtout *C. Craterellus*). ...” —Romagnesi (1953: 408).

The similarity between *Chaetocalathus* and *Lachnella* is in many respects striking indeed. The former genus was separated from *Crinipellis* because of the sessile and dorsally attached caps (stalked in *Crinipellis*) which often become globular when drying. “It is obvious”, Singer (1951: 344) remarks, “that *Lachnella* is closest to *Chaetocalathus* which differs in the well developed hymenophore and smooth epicuticular hairs; also in the presence of pseudoamyloid cystidia or spores. A similar type of echinulate hairs [as is found in *Lachnella*] is not found in the whole Marasmiinae-series but can be recognized in the cortical hairs of such *Mycenas* as *Mycena osmundicola*.” (In my opinion the ‘echinulation’ in *Lachnella* is of a different type from that in the *Mycenas* mentioned.)

Further, the occurrence of spindle-shaped basidioles (occurring abundantly at least in one species) of the type depicted for *Marasmius rotula* (Scop. per Fr.) Fr. and *M. androsaceus* (L. per Fr.) Fr. by Kühner (1933: 65 f. 1, pl. 7 fs. 1, 4, 5) should not pass unnoticed. Such basidioles of the “*Collybia-Marasmius*-type” (Singer 1951: 344) are not only found in many species of *Marasmius* Fr. but are also found in *Crinipellis*, where they seem of general occurrence (Singer, 1942: 447).

Locquin (1952: 165–166) even goes a step further and proposes to combine the two genera under the name *Lachnella*:—

“... si les filaments cuticulaires sont lisses dans l'un et échinulés dans l'autre, il ne s'agit pas de vraies échinulations, mais d'un précipité de microcristaux de sulfate de calcium plus ou moins empâtés dans la membrane. Ceci explique leur achromatisme dans tout colorant et spécialement vis à vis des réactifs iodés. Cet empatement de cristaux se retrouve dans la paroi des cystides de la section *Holocystis* Singer de *Chaetocalathus*.”

Moreover, Locquin (1952: 169) expresses his doubt about the practical value of the pseudoamyloid reaction, especially on the generic level. Without entering

into a discussion on the latter question and only briefly remarking that the nature of the surface of the hairs in *Lachnella* seems not adequately explained by Locquin, I would remark that there are quite an imposing number of differences between the two genera, which are sufficient to keep them separate: lamellate hymenophore in *Chaetocalathus*, different behaviour of the hairs in KOH solution, different surface of the hairs, bigger basidia and spores as well as a characteristic shape of the spores in *Lachnella*.

Locquin not only combines *Chaetocalathus* and *Lachnella*, he also throws in *Merismodes* (cf. Singer, 1951: 345). I am again unable to follow Locquin but a discussion will be reserved to a future occasion after *Merismodes* has been treated in the present series of notes.

It might well be that *Lachnella* is related to a species that has been described under the name of *Kordyana cyphelloides* Viégas (1945: 253 *textpl.* 1). This species certainly does not belong to *Kordyana* Racib. (Exobasidiaceae), but seems rather the type of a new genus. From the appearance of its fruit-body under low magnification it resembles *Wiesnerina* (see p. 45), but the hairs form a kind of calyx-like peridium around the disk and thus are evidently not homologous with the cystidia arising throughout the disk in *Wiesnerina*. These hairs are thick-walled, hyaline, and asperulate; the basidia and spores are rather big ( $28-42 \times 10-12 \mu$  and  $14-16 \times 7-8 \mu$ ); and the spores are somewhat triangular, broadest below the middle. However, the hairs rather gradually taper upwards and the fruit-body breaks through the epidermis of living leaves, a situation not matched by any form of *Lachnella*.

According to Maire (1902: 101) *Cyphella villosa* has chiasitic basidia.

The reintroduction of the name *Lachnella*, previously universally in use for variously circumscribed groups of Discomycetes, became necessary by the lack of support for a generally acceptable proposal for conservation of a discomycetous genus of that name. Donk (1951: 212) explained its present use for a genus of basidiomycetes which has already been accepted by Singer (1951: 343).

#### LACHNELLA ALBOVIOLASCENS (A. & S. per Pers.: Fr.) Fr.

*Peziza sessilis* Sow., Col. Figs Engl. Fungi *pl.* 389 *f.* 1. 1803 (devaliated name). — *Peziza sessilis* Sow. *per* Purt., App. Middl. Fl. 466. 1821. — *Dasyscyphus sessilis* (Sow. *per* Purt.) S. F. Gray, Nat. Arr. Brit. Pl. 1: 671. 1821. — Type locality: Great Britain.

*Peziza nivea* Schum., Enum. Pl. Saell. 2: 435. 1803 (devaliated name); not *P. nivea* Dicks., Fasc. Pl. crypt. Brit. 1: 21. 1785 (devaliated name) *per* Purt., App. Midl. Fl. 456. 1821; not *P. nivea* Batsch, Elench. Fung. 117. 1783 *per* Pers., Mycol. europ. 1: 295. 1822; not *Peziza nivea* (Hedw. f.) *per* Fr., Syst. mycol. 2: 90. 1822. — Type locality: Denmark, Sjaelland. — Fide Fr., Syst. mycol. 2: 96. 1822 = *Peziza alboviolascens* ["!"].

*Peziza alboviolascens* A. & S., Consp. Fung. nisk. 322 *pl.* 8 *f.* 4. 1805 (devaliated name). — *Peziza fallax* var. *alboviolascens* (A. & S.) *per* Pers., Mycol. europ. 1: 266. 1822. — *Peziza alboviolascens* (A. & S. *per* Pers.) Schw. in Schr. naturf. Ges. Leipz. 1: 120. 1822; Fr., Syst. mycol. 2: 96. 1822; Berk. in J. E. Sm., Engl. Fl. 5 (2): Index p. x. 1836 ("alboviolacea", correct on p. 196). — *Lachnella alboviolascens* (A. & S. *per* Pers.: Fr.) Fr., Summa Veg. Scand. 2: 365. 1849; P. Karst., Fung. Fenn. exs. No. 329. 1866. — *Cyphella alboviolascens* (A. & S. *per* Pers.:

Fr.) Crouan, Fl. Finist. 61. 1867; P. Karst., Fung. Fenn. exs. No. 715. 1868. — *Chaetocypha alboviolascens* (A. & S. per Pers.: Fr.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Cyphellopsis alboviolascens* (A. & S. per Pers.: Fr.) Donk in Meded. Nederl. mycol. Ver. 18–20: 129. 1931.

*Peziza fallax* Pers., Mycol. europ. 1: 266. 1822; not *P. fallax* Desm. in Ann. Sci. nat. (Bot.) III 3: 367. 1845. — Type locality: Europe, perhaps France; lectotype, L 910.261–947.

*Peziza velutina* Desm., Cat. Pl. om. 14. 1823; not *P. velutina* St.-Am., Fl. agen. 531. 1821; not *P. velutina* Wallr., Fl. crypt. Germ. 2: 487. 1833. — *Peziza alboviolascens* var. *velutina* (Desm.) Duby, Bot. gall. 2: 1045. 1830. — Type: France, near Lille [Desm.; cf. hb. Fr.-UPS, K, & type-distribution (?) in Desm., Pl. Crypt. Nord France No. 17]. — Fide Fr., Elench. 2: 9. 1828 = *Peziza alboviolascens* (forma).

[*Peziza alboviolascens* b. *alba*: Fr., Elench. 2: 9. 1828 ('alba' not an epithet but a one-word description). —] *Peziza alboviolascens* var. ("b.") *alba* Desm., Pl. crypt. Nord France No. 119. 1826. — *Cyphella alboviolascens* var. *alba* (Desm.) Roum., Fungi gall. exs. No. 2915. 1884. — Type (selected): same as of *Peziza velutina* Desm.

*Ascobolus vitis* Wallr. ("ined."); Fr., Elench. 2: 9. 1828 (as a synonym). — Specimen: Germany, presumably Thüringia (hb. Fr.-UPS). — Fide Fr., l.c. = *Peziza alboviolascens*.

? *Peziza vitis* Schw. in Trans. Amer. phil. Soc. II 4: 173. 1832. — *Trichopeziza vitis* (Schw.) Sacc., Syll. Fung. 8: 429. 1889. — Type locality: U.S.A., Pennsylvania, Bethlehem.

*Peziza syringeae* Wallr., Fl. crypt. Germ. 2: 455. 1833. — *Trichopeziza syringeae* (Wallr.) Fuck. in Jb. Nassau. Ver. Nat. 29–30: 31. 1875. — *Cyphella syringeae* (Wallr.) Cooke in Grevillea 20: 9. 1891 ("syringae"). — Type locality: Germania, Thüringia.

*Peziza ornata* Saut. in Flora, Jena 24: 309. 1841. — *Lachnella ornata* (Saut.) Saut. in Mitth. Ver. Salzburg. Landesk. 6: 49. 1866 (n.v.). — Type locality: Austria. — Fide Wint. in Hedwigia 20: 130. 1881 & Keissl. in Ann. naturh. Hofmus., Wien 31: 98. 1917 = *Cyphella alboviolascens*.

*Myriotheceium vitis* Bon., Handb. allgem. Mykol. 243 pl. 10 f. 215. 1851. — *Volutella vitis* (Bon.) Sacc., Syll. Fung. 4: 688. 1886. — *Cyphella vitis* (Bon.) Höhn. ("in litt.") apud Sacc. & D. Sacc. in Sacc., Syll. Fung. 17: 192. 1905. — Type locality: Germany.

*Cyphella curreyi* Berk. & Br. in Ann. Mag. nat. Hist. III 7: 379. 1861 & in Rab., Fungi europ. exs. No. 416. 1862 (with description). — Type & type distribution: Great Britain, Batheaston (Broome, K, & in Rab., Fungi europ. exs. No. 416). — Fide P. Karst. in Bidr. Känn. Finl. Nat. Folk. 25: 322. 1876 & Talbot in Bothalia 6: 471, 472. 1956 = *Cyphella alboviolascens*.

*Lachnella alboviolascens* f. *caraganae* P. Karst., Fung. Fenn. exs. No. 329. 1866 (nomen nudum). — Type distribution: Finland, Mustiala (P. Karst., Fung. Fenn. exs. No. 329).

*Corticium dubium* Quél. in Mém. Soc. Emul. Montbéliard II 5: 444 pl. 1 f. 10. 1875. — *Cyphella dubia* (Quél.) Quél. in Bull. Soc. bot. France 25: 290. 1879 (in obs. to *C. villosa*). — *Cyphella alboviolascens* var. *dubium* (Quél.) Krieger, Fung. saxon. exs. No. 1807. 1904. — Type: "Gallia austr.-orient." (Quél., hb. Fr.-UPS). — Fide Quél., Fl. mycol. France 27. 1888 = *Cyphella alboviolascens*.

*Cyphella stuppea* Berk. & Br. in Ann. Mag. nat. Hist. V 1: 25. 1878; Sacc., Syll. Fung. 6: 675. 1888 ("stuppea"). — *Chaetocypha stuppea* (Berk. & Br.) O.K., Rev. Gen. Pl. 2: 848. 1891 ("stuppea"). — Monotype: Great Britain, Scotland, Menmuir (M. L. Anderson, K).

*Cyphella pezizoides* Zopf in Zopf & P. Syd., Mycoth. march. No. 1. 1879 (with description and figure). — Type distribution: Germany, near Berlin, Kreuzberg (Zopf, in Zopf & P. Syd., Mycoth. march. No. 1).

*Cyphella villosa* var. *lutescens* Roum., Fungi gall. exs. No. 1810. 1882 (nomen nudum). — *Cyphella villosa* f. *lutescens* (Roum.) ex Roum. in Rev. mycol. 5: 142. 1883 (reference to description in Rev. mycol. 4: 20, foot-note). — Type distribution: France, Nimes (Roum., Fungi gall. exs. No. 1810).

[*Peziza alboviolascens* f. *alba* Fr., Elench. 2: 9. 1828 ('alba' not an epithet but a one-word

description). —] *Cyphella alboviolascens* f. *minuscule* Roum., Fung. gall. exs. No. 1906. 1882 (reference, “*P. Alb. v. β. alba* Fr. El. —”); in *Rev. mycol.* 4: 23. 1882 (name only). — Type (selected): same as of *Peziza velutina* Desm. and *Peziza alboviolascens* var. *alba* Desm.

*Cyphella villosa* f. *solani* P. Syd., Mycoth. march. No. 1233. 1886 (without description). — Type distribution: Germany, near Berlin, Lichterfelde (P. Syd., Mycoth. march. No. 1233).

*Cyphella villosa* f. *sambuci* P. Syd., Mycoth. march. No. 1806. 1887 (without description). — Type distribution: Germany, near Berlin, Thiergarten (P. Syd., Mycoth. march. No. 1806).

MISAPPLICATION?—*Sphaeria tomentosa* Relh. *per* Purt. *sensu* Purt., App. Midl. Fl. 287 (in obs. on p. 288). 1821.

DESCRIPTIONS & ILLUSTRATIONS.—Fries, *Syst. mycol.* 2: 96. 1822 (*Peziza*; with exclusion of var.  $\beta$ ); Karsten in *Bidr. Känn. Finl. Nat. Folk* 25: 322. 1876 (*Cyphella*); Burt in *Ann. Missouri bot. Gdn* 13: 315. 1926 (*Cyphella*); Bourdot & Galzin, *Hym. France* 159. 1928 (*Cyphella*); Donk in *Meded. Nederl. mycol. Ver.* 18–20: 129. 1931 (*Cyphellopsis*).

Hairs very much as in *Lachnella villosa*, about  $200 \times 5-6 \mu$ . Basidia  $60-75 \times 12-16 \mu$ , with 2–4 sterigmata of about  $10 \mu$  long,  $4-4.5 \mu$  wide at base. ‘Basidioles’ absent or at least not a conspicuous hymenial element. Spores broad-inversed-ovoid, adaxially somewhat flattened,  $13.5-15.25 \times 9-12 \mu$  with distinct, blunt, excentric apiculus; contents granular.

TYPE LOCALITY.—Germany, Oberlausitz. Type: “*Peziza albo-violascens nobis*” (L 910.261–8; Persoon added, “*Alb. et Sweinitz*”).

SOME SPECIMENS EXAMINED.—Type, cited above, and several collections mentioned below in the discussion and other ones, inclusive of the types or portions of the types of *Peziza fallax* Pers., *P. velutina* Desm. (*Peziza alboviolascens* var. *alba* Desm., *Cyphella alboviolascens* f. *minuscule* Roum.), *Ascobolus vitis* Wallr., *Corticium dubium* Quél., *Cyphella stuppea* Berk. & Br.; and one or more copies of the type-distributions of *Cyphella curreyi* Berk. & Br., *Cyphella villosa* var. *lutescens* Roum., *Lachnella alboviolascens* f. *caraganae* P. Karst., *Cyphella pezizoides* Zopf, *Cyphella villosa* f. *solani* P. Syd., *Cyphella villosa* f. *sambuci* P. Syd.; &c.

For differences from *Lachnella villosa*, see that species.

It would seem that the colour of the disk is variable. In most cases it becomes dark at least when drying and in the herbarium the disk is seen as a dark ring shining through the hairy covering in flattened and pressed fruit-bodies. However, more or less luxurious and proliferous fruit-bodies may lack any indication of the purplish colour and the disk may remain pallid, yellowish (*Peziza fallax* Pers.).

The identity of *Peziza alboviolascens* A. & S. has never been seriously questioned. Its current application is supported by a specimen sent to Persoon by the authors of the species (as cited above as type). It still shows a very few fruit-bodies typical of the present species. (I did not examine any microscopically.) The specimen should be considered type as long as other ‘authentic’ material has not been located. There is also a specimen marked in Persoon’s handwriting “*Peziza albo-violascens, Alb. et Sweinitz.*” (L 910.261–6) which may also have been sent by the authors of the name but was kept separately because it grew on a different substratum. The fruit-bodies in this case have become covered by glue when the piece of bark was pasted to the sheet; nevertheless these fruit-bodies are also recognizable as *P. alboviolascens*. (Not examined microscopically.)

Persoon introduced the name *Peziza fallax* for the present species apparently because he thought the name *P. alboviolascens* not completely appropriate for the species as a whole. For him typical specimens were "intus pallescens" and of *P. alboviolascens* he made a variety ( $\beta$ ), "intus caesia vel violascens". As is explained above such a difference is irrelevant. A fine set of specimens in Persoon's herbarium fixes the identity of *P. fallax* (L 910.261-953, 910.261-959, 910.261-946 & -947). An exception is L 910.261-952, "*Peziza fallax*. Myc." (written by Persoon), which I would refer to *Lachnella villosa*. The substratum of this specimen seems to be an umbelliferous stalk. I have chosen L 910.261-947 as type; it is labelled in Persoon's handwriting, "*Peziza fallax*, Mycol. Europ." Moreover, there is a specimen in the Herbarium at Kew which was named *P. fallax* by Persoon.

*Peziza sessilis* Sow. has usually been listed as a synonym of *Lachnella villosa* in agreement with Fries (1822: 114), but in my opinion its identity with *L. alboviolascens* is much more likely.

Study of a portion of the type of *Peziza velutina* Desm. showed that Fries was correct in referring this name as a synonym to *Peziza alboviolascens*. He was also correct when he referred the herbarium name *Ascobolus vitis* Wallr. as a synonym to the latter species, as could be verified from the specimen he received.

*Peziza syringea* Wallr. is referred here on the basis of its description; its author compared it with *P. alboviolascens*.

*Myriotheecium vitis* Bon. is referable here with certainty on the basis of the original account. Bonorden clearly drew basidia and also caught well the characteristic outline of the spore; he wrote, "mit grünlich-schimmerndem Hymenium", which I regard as a trivial discrepancy. The vine seems a favourite host of *Lachnella alboviolascens* and one wonders if *Peziza vitis* Schw. is not still another synonym. Seaver (1951: 281) reports that the "type examined May, 1931 shows only lichen apothecia." The original description strongly points into the direction of *Lachnella alboviolascens*.

Moreover, I have been able to study types or portions of types of *Cyphella curreyi* Berk. & Br., *Lachnella alboviolascens* f. *caraganae* P. Karst., *Corticium dubium* Quél., *Cyphella stuppea* Berk. & Br., *C. pezizoides* Zopf, and *Cyphella villosa* f. *sambuci* P. Syd.; all are further synonyms of *Lachnella alboviolascens*. The reason for the introduction of the name *Cyphella curreyi* is discussed on page 31.

For *Peziza nigrocaesia* Schum., see page 58.

The Tulasne brothers (1851: 134) concluded that *Cyphella taxi* Lév. was conspecific with *C. alboviolascens*. This is not the case: the type (!) of *Cyphella taxi* shows a quite different species identical with, or very close to, *Cyphella cupulaeformis* Berk. & Rav. apud Berk. The material they cited from *Rhamnus* is true *Lachnella alboviolascens* (specimen seen!) while the material from *Eryngium* they mention undoubtedly belongs to *Lachnella villosa*.

It is not known now, I think, what *Sphaeria tomentosa* Relh. precisely stands for, but the collection Purton discussed in an observation to this treatment of the species represents *Lachnella alboviolascens*: the collection is preserved at Kew.

## LACHNELLA VILLOSA (Pers. per Schw.: Fr.) Gillet

*Sclerotium villosum* Tode, Fungi mecklenb. 1: 6. 1790 (devalidated name). — Type locality: Germany, Mecklenburg.

*Sclerotium villosum* var. ( $\alpha$ ) *album* Tode, Fungi mecklenb. 1: 6. 1790 (devalidated name)  $\equiv$  *Sclerotium villosum* Tode.

*Peziza sclerotium* Pers., Obs. mycol. 2: 84. 1799 (devalidated name).

*Peziza incarnata* Pers., Obs. mycol. 2: 84. 1799 (devalidated name). — [*Peziza villosa* var. " $\beta$ . *P. incarnata*" Pers., Syn. Fung. 655. 1801. —] *Peziza villosa* var. *incarnata* (Pers.) A. & S., Consp. Fung. nisk. 325. 1805 (devalidated name). — *Peziza granuliformis* var. *incarnata* (Pers.) per Pers., Mycol. europ. 1: 267. 1822. — Type locality: Germany; type: L 910.261-665. — Fide Fr., Syst. mycol. 2: 104. 1822 = *Peziza villosa*.

*Peziza granuliformis* Pers., Syn. Fung. 651. 1801 (devalidated name); not *P. granulaeformis* Schum., Enum. Pl. Saell. 2: 435. 1803 (devalidated name). — *Peziza granuliformis* Pers. per Pers., Mycol. europ. 1: 267. 1822; not *P. granuliformis* (Crouan) P. Karst. in Bidr. Känn. Finl. Nat. Folk. 19: 50. 1871. — Type locality: Germany; lectotype: L 910.261-665. — Fide Fr., Syst. mycol. 2: 104. 1822 = *Peziza villosa*.

*Peziza villosa* Pers., Syn. Fung. 655. 1801 (devalidated name). — [*Peziza granuliformis* var. " $\beta$ . *Peziza villosa*" Pers., Mycol. europ. 1: 267. 1822. —] *Peziza villosa* (Pers.) per Schw. in Schr. naturf. Ges. Leipz. 1: 120. 1822; Fr., Syst. mycol. 2: 104. 1822; not *P. villosa* Chev., Fl. gén. Env. Paris 1: 288. 1826. — *Cyphella villosa* (Pers. per Fr.) Crouan, Fl. Finist. 61. 1867; P. Karst., Fungi Fenn. exs. No. 719. 1868; Berk. & Br. in J. Linn. Soc., Lond. (Bot.) 14: 74. 1873; Cooke & Quélet, Clav. Hym. 222. 1878 (cf. Quélet in Bull. Soc. bot. France 25: 290 pl. 3 f. 14. 1879); not *C. villosa* (Fr.) Pat., Essai taxon. Hym. 55. 1900. — *Trichopeziza villosa* (Pers. per Fr.) Fuck. in Jb. nassau. Ver. Nat. 23-24: 296. "1869" [1870]. — *Lachnella villosa* (Pers. per Fr.) Gillet, Champ. France, Disc. 80. 1881; Donk apud Sing. in Lilloa 22: 345. 1951. — *Chaetocypha villosa* (Pers. per Fr.) O.K., Rev. Gen. Pl. 2: 848. 1891. — *Solenia villosa* "(Pers. ex Karst.) [W. B.] Cooke ined."; Sing. & Digilio in Lilloa 25: 234. 1952 (matter of record); not *S. villosa* Fr., Syst. mycol. 2: 200. 1822;  $\equiv$  *Peziza sclerotium* Pers.

*Peziza villosa* var. *candida* A. & S., Consp. Fung. nisk. 325. 1805 (devalidated name)  $\equiv$  *Peziza villosa* Pers.

*Peziza villosa* var. *carnea* Wallr., Fl. crypt. Germ. 2: 450. 1833. — Type (selected): same as of *Peziza incarnata* Pers.

*Cyphella dochmiospora* Berk. & Br. in Ann. Mag. nat. Hist. IV 11: 343. 1873; Quélet in Bull. Soc. bot. France 25: 290. 1879 ("*Jochmiospora*"; as a synonym). — *Chaetocypha dochmiospora* (Berk. & Br.) O.K., Rev. Gen. Pl. 2: 847. 1891. — *Cyphella villosa* f. *dochmiospora* (Berk. & Br.) Jaap in Ann. mycol., Berl. 3: 399. 1905. — Type: Great Britain, Batheaston (Broome, K). — Fide Quélet, l.c. = *Cyphella villosa*.

? *Cyphella villosa* f. *major* Pilát in Ann. mycol., Berl. 23: 153. 1925; in Publ. Fac. Sci. Univ. Charles No. 29: 45. 1925. — Type locality: Central Bohemia, near Karlik.

DESCRIPTIONS & ILLUSTRATIONS.—Quélet in Bull. Soc. bot. France 25: 290 pl. 3 f. 14. 1879 (*Cyphella*); Patouillard, Essai taxon. Hym. 56 f. 38: 8. 1900 (*Cyphella*); Bourdot & Galzin, Hym. France. 159. 1928 (*Cyphella*).

Hairs in KOH solution about  $150-200 \times 4.75-6 \mu$ , colourless, with asperulated surface, the full-grown ones with very thick walls and capillary lumen (lumen somewhat widening in the tip), many with deformed portions which are much swollen and very transparant (asperulation has disappeared) and have a thread-like or vanished lumen. Basidia  $40-48-60 \times 9-11 \mu$ , with 2-4 conical, curved sterigmata of about  $10 \times 3 \mu$ . 'Basidioles' numerous, originally subcylindrical with tapering top, then becoming inflated at middle and spindle-shaped, finally like the basidia but with apical nipple. Spores broad inversed-conical,  $10-15 \times 7-10 \mu$ , adaxially faintly flattened, with distinct, blunt, excentric apiculus.



TYPE LOCALITY.—Germany. Type of *Peziza sclerotium* Pers.  $\equiv$  *P. villosa* Pers.: “[prope] Gottingae lecta / *Peziza villosa*” (written by Persoon; L 910.256–1317; devoid of fruit-bodies).

SOME SPECIMENS EXAMINED.—Type, cited above, and several collections mentioned below in the discussion.

The fruit-body is on an average much smaller and more tender than in *Lachnella alboviolascens*, and closes less perfectly to a globular body. The latter species has a more fleshy disk which almost invariably (at least in not too proliferous fruit-bodies) turns dark. The presence of numerous ‘basidioles’ may be another important difference. Finally, *L. villosa* prefers herbaceous or only slightly woody substrata, while *L. alboviolascens* grows almost invariably on woody substrata (though these may be very thin branches).

A few words may be said about a specimen collected on *Pteris aquilina* (in herb. J. Schroeter, BRSL, Silesia, Trebnitz, Obernigk). It differs in its spores which show a constriction below the top so that it seems as if the latter is surmounted by a broad and relatively large nipple. Some of the spores are almost ‘normal’, some of them resemble the figures of the spores of *Cyphella turbinata* G. Cunn. (see p. 107).

When Persoon thought he had found the fungus that Tode called *Sclerotium villosum* (more in particular, *S. villosum* var. *album*) he recognized it as a cup-fungus and named it, first, *Peziza sclerotium* Pers., and afterwards, *P. villosa*. Both epithets are presumably inspired by Tode’s name and one could defend the thesis that both names Persoon published are mere isonyms of *Sclerotium villosum*, which would mean that the type of *Cyphella villosa* ‘(Tode) Pers.’ is the same as of *Sclerotium villosum*. The correct authors’ citation for the name here adopted then would become ‘(Tode per [Schw.:] Fr.) Gillet. In view of the fact that Persoon never listed *Sclerotium villosum* as a synonym without some indication of uncertainty, I have here followed current practice and treat the name *Peziza sclerotium* as a metonym, based on a different type—one of Persoon’s own specimens.

Tode (l.c.) evidently misinterpreted the fungus which he seems to have studied only in the dried condition, when the walls are strongly curved inwards and the fruit-body resembles a globule without any visible mouth or pore. However, the section depicted by Tode shows that he found a hollow inside that communicated with the outside. Although Tode stated “magnitudine arenulae modicae” he depicted the “fungi aggregati, magnitudine naturali” (fig. 10a) too big for the present species. He thought the hollow opened downwards (presumably towards the substratum; fig. 10c) and he also rendered the hairs as radiating from an outer wall (fig. 10c). He indicated the substratum as, “In caulibus *Solani tuberosi* semiputridis.” I am not quite convinced that Tode’s fungus really is *Lachnella villosa*: it still might be *L. alboviolascens*, which has occasionally been found on the substratum indicated by Tode for his *Sclerotium villosum* var. *album*.

About *Peziza villosa* Pers. we are informed by material kept in his herbarium at Leiden, although some important specimens no longer bear fruit-bodies. One of

these (L 910.256-1317) is labelled in his handwriting, "*Peziza villosa*. / [prope] Gottingae lecta"; this must be taken as type. Another specimen (L 910.261-557), too, is devoid of fruit-bodies; it is labelled, "*Peziza sclerotium* Obs. mycol. ['Syn. fung.' being crossed out] — *villosa* — Syn. fung. / *Sclerotium villosum* Tode videtur" (written by Persoon). In both cases the substratum is not a woody one, but may well be umbelliferous stalks; in any case the substratum is 'herbaceous'. A third specimen (L 910.261-812) is still determinable with certainty as *Peziza villosa*: it was sent to Persoon with the label, "in caulibus *Solani tuberosi*", and Persoon named it "*Peziza villosa*. Syn. fung. p. 267."

Persoon published two more names for the present fungus; first, in conjunction with *Peziza villosa*, he introduced *Peziza incarnata* Pers.; and, afterwards, *P. granuliformis* Pers. Already when he published *P. incarnata* the author had his misgivings about its specificity and stated, "Uti et antecedens [*P. villosa*], cujus forte varietas . . ." He soon reduced it formally to the rank of a variety of *P. villosa*. The differences between the two, as stated by Persoon, are that the latter species had white fruit-bodies and *P. incarnata*, pinkish ones. Persoon's and Fries's reduction of *P. incarnata* to *P. villosa* is now generally accepted and seems correct. In both the substratum is big herbaceous stalks.

It is less clear why *P. granuliformis* was published. Its author (Persoon, 1822: 267) afterwards recognized it himself as conspecific with both *Peziza villosa* and *P. incarnata*, which he appended as varieties ( $\beta$  and  $\gamma$  respectively) to *P. granuliformis*. There are three sheets of *P. granuliformis* preserved. Two of these (L 910.261-665 & 910.261-651) may have formed a single collection. The one which I select as type (L 910.261-665) is labelled in Persoon's handwriting, "*Peziza granuliformis* Syn. fung. p. 6 [51] / — *villosa* Ejusd. p. 655." It shows that finally he considered the two as completely identical, a conclusion also reached by Fries, and to which I subscribe. A third (L 910.256-1204, "circa Parisios") is also *Lachnella villosa*, while the same applies to a fourth (L 910.261-661; with a "?").

As to *Cyphella villosa* as described by Patouillard (1884: 115 f. 257), Pilát (1924: 208) remarks about it: "Patouillard schreibt unrichtig [Sporen]  $4 \times 7 \mu$ . Er hat wahrscheinlich *Cyphella stenospora* Bourt. et Galz. zur Hand und vielleicht die wirkliche *Cyphella villosa* Karst. überhaupt nicht gekannt." It would appear that Pilát took these spore measurements from Saccardo. If one computes them from Patouillard's figure, one gets  $9-10.5 \times 4 \mu$ . If one takes into consideration that Patouillard on several occasions in his "Tabulae" gave spore sizes too small and that he clearly depicted spindle-shaped basidioles as well as somewhat triangular spores, then one may conclude that his determination of the depicted fungus was correct.

#### LACHNELLA TILIAE (Peck) Donk apud Sing.

*Peziza tiliae* Peck in Rep. New York St. Mus. nat. Hist. 24: 96. 1872 (n.v.). — *Trichopeziza tiliae* (Peck) Sacc., Syll. Fung. 8: 428. 1889. — *Cyphella tiliae* (Peck) Cooke in Grevillea 20: 9. 1891. — *Lachnella tiliae* (Peck) Donk apud Sing. in Lilloa 22: 245. "1949" [1951].

? *Trichopeziza candida* Clem. in Bot. Surv. Nebraska (Stud. Veget. Neb.) 4: 15. 1896 (n.v.). — Type locality: U.S.A., Nebraska. — Fide Clem., l.c., "possibly *Trichopeziza tiliae* (Peck) Sacc."

DESCRIPTION & ILLUSTRATION.—Burt in Ann. Missouri bot. Gdn 1: 364 pl. 19 f. 1. 1914 (*Cyphella*).

Fruit-body turbinate, the disk rather flattened, the dried fruit-body with a hard core which resists crushing under the cover-glass for a considerable time. Hairs in KOH solution  $-250\ \mu$  long (or longer),  $5-7.5\ \mu$  wide, with lumen capillary only at base and gradually widening upwards, asperulate, locally swollen-deformed as in *L. villosa*. Basidia (especially those at centre of disk) very gradually narrowing downwards,  $78-125 \times 10.5-14\ \mu$ , with 2(-3-4) horn-shaped sterigmata,  $7-11 \times 3-4\ \mu$  long. Spores slender-trigonal ellipsoid,  $16-19.5 \times 5.75-7\ \mu$ , broadest near base, many slightly constricted just above middle, adaxially flattened or even slightly depressed, with almost lateral apiculus; contents granular.

Nearly always on branches of *Tilia*.

TYPE.—U.S.A., New York, Knowersville (Peck, NYS, K).

SPECIMENS EXAMINED.—U.S.A., Type (K); Vermont, Middlebury (Burt, hb. Bourd. 16.101); Missouri, Emma (Demetrio; Rab., Wint., & Pazschke, Fungi europ. & extraeur. No. 3942). CANADA, London (Dearness, in Ell. & Ev., N. Amer. Fungi II No. 2316a, as *Cyphella pezizoides*).

Easily distinguishable from the two other species by its more slender and longer spores, the longer basidia, and by the substratum which is nearly always *Tilia*. It is not known from outside the North American continent.

### Other species of *Lachnella*

#### CYPHELLA CHEESMANNI Mass.

*Cyphella cheesmanni* Mass. in J. Linn. Soc., Lond. (Bot.) 38: 411. 1909. — Type locality: S. Rhodesia, Victoria Falls (W. N. Cheesman).

I suspect that this may belong to *Lachnella*, perhaps *L. alboviolascens* ("sporis ovoideis, . . . hyalinis,  $12-15 \times 7-8\ \mu$ "; "in ramis decorticatis"). The indication that the spores are finely asperulate would in that case be an error.

#### CYPHELLA PYRIFORMIS G. Cunn.

*Cyphella pyriformis* G. Cunn. in Trans. roy. Soc. New Zealand 81: 184 fs. C10, D14. 1953 ("pyriforma"). — Holotype: New Zealand, Taranaki, Mt. Egmont (J. M. Dingley).

This would differ from *Lachnella alboviolascens* in the shape of its spores, "pyriform, flask-shaped, or tear-shaped, base rounded, apex long-acuminate".

#### CYPHELLA TURBINATA G. Cunn.

*Cyphella turbinata* G. Cunn. in Trans. roy. Soc. New Zealand 81: 185 fs. C11, D15. 1953. — Holotype: New Zealand, Otago, Invercargill (W. Faithful).

Another species that seems very close to *Lachnella alboviolascens*, but has "turbinate" spores. The accompanying figure depicts them as pear-shaped (with the narrow end apically); the spores of *Cyphella pyriformis* (see above) are not as typically pear-shaped. Compare a note under *L. villosa* in the present paper on an 'abnormal' European collection, on *Pteris aquilina*.

*Cyphella australiensis* Cooke (see also p. 69) is based on a specimen that, according to Cunningham (1953a: 277) is a specimen of an immature *Aleurodiscus*. I have only seen the later collection referred by Cooke to *C. australiensis* (Australia, New South Wales, Centennial Park, leg. E. Cheel 21, K, on dead branches of Jasmine). This collection Cunningham refers to *Cyphella villosa*, but to me it looks more like typical *Lachnella albobioviolascens*, because of the size of the cups (1–1.5 mm in diam.) and the substratum (“on bark”); I did not examine it microscopically.

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