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Type Studies on Basidiomycetes. VIII.*)

By Rolf Singer (Tucuman, Argentina).

The present series of Type Studies is mainly concerned with type material deposited at the Kew Herbarium (K) and the Cryptogamic Herbarium of the Museum d'Histoire Naturelle Paris (PC). The studies were made possible by a grant received from the American Philosophical Society for which the author is deeply grateful. Some additional analyses are based on material deposited at Gainesville, Fla. (FLAS), New York (NY), Albany, N. Y. (NYS), the Herbarium of Cornell University, Ithaca, N. Y. (CU), the Chicago Natural History Museum (F) and Farlow Herbarium, Cambridge Mass. (FH). It is a pleasant duty to thank the curators and directors of the various institutions mentioned above for their permission to analyse the types. The author wishes to express his special gratitude to Dr. R. W. G. Dennis, Kew Herbarium, for the permission to study his valuable collections from Venezuela and Trinidad as well as the notes and drawings that go with them, for valuable assistance and interesting discussions, and for innumerable courtesies on his part. For the work done in the United States, the author is indebted to the John Simon Guggenheim Memorial Foundation. Without a fellowship from the Guggenheim Foundation, 1952—53, much of the work published here would not have been possible.

The species analyzed are enumerated in the order of the genera to which they belong (classification of the author, 1951) rather than in which they were originally described.

Aphyllophorales.

Campanella Henn.

Marasmius merulinus Berk. & Curt.

Spores 8.8—9.3 ⇌ 6—6.3 µ, nonamyloid, smooth, hyaline to stramineous, ellipsoid; basidia (1)—4-spored, large, clavate, hyaline, sometimes stramineous, 45 ⇌9.3—9.5 µ, clamped at the base;! cystidia none or only a few present, scattered among the basidia and not projecting, hyaline or stramineous, filamentous, 3.3—3.8 µ broad, very inconspicuous; cheilocystidia none; hymenophoral trama and trama of the pileus consisting of filamentous hyphae, running in all

*) Former contributions under the same title were published in Mycologia 34: 64—93. 1942; 35: 142—163. 1943; 39: 171—189. 1947; Lilloa 23: 147—246. 1950 (1952); Sydowia 5: 445—475. 1951; Lilloa 26: 57—159. 1953; Sydowia 6: 344—351. 1952.

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directions but mainly applanate-repent and, especially in the lower layer, parallel to subparallel with each other, imbedded in a gelatinous mass, the terminal members of the surface sometimes swollen or more frequently thinned out and with inconspicuous branchlets and short spine-like processes, some at a right angle although there is no definite layer with *Astrostromella*-structure, subhymenium ramose and less gelatinous than the trama.

This is authentic material preserved at FH, Wright, Pl. Cub. Wright. no. 133. It is a *Campanella,* **C. merulinus** (Berk. & Curt.) Sing. comb. nov.

Favolaschia (Pat.) Henn.

Laschia antarctica Speg.

Spores 9.5—11 ⇌ 6.8—8.3 μ, amyloid, smooth, without suprahilar applanation or depression, globose-short-ellipsoid or short-ellipsoid; basidia long; among the basidia in the hymenia some basidiomorphous gloeocystidia; gloeocystidia also present, as well as gloeovessels, in the upper layer of the pileus and on the pileus surface, but not many reaching the surface and then cystidioid, clavate, about 8—8.5 μ thick or narrower, these as well as the gloeo-vessels strongly deep blue in cresyl blue mounts; dendrophyses on pileus surface and in marginal position, hyaline, some with a pale fuscous dissolved intracellular pigment (this may be the cause of the darkening of the carpophores), cylindrical or cylindric-clavate, or tennis-racket-shaped to clavate and then up to 16.5 μ broad, with spinules of somewhat variable size, mostly 1—2 μ long, some to 3.5 μ, but generally less strongly echinate than in *F. echinata,* without an amyloid body inside; hyphae of the upper layer of the pileus gelatinized; with clamp connections, nonamyloid. The pileus is white, but becomes spadiceous in the herbarium, with distinct lateral pseudostipe.

This is the type from Staten Island, Tierra del Fuego. Argentina, NY. The difference between this species and *F. echinata* (which is very close) is evident because of the better developed pseudostipe, the sligtly shorter spinules of the dendrophyses, the absence of an amyloid body inside the dendrophyses, the slightly smaller pilei and smaller pores. The new combination **Favolaschia antarctica** (Speg.) Sing. is herewith proposed.

Favolaschia auriscalpium (Mont.) Pat.

Spores about 10 ⇌ 6.5 μ, smooth, amyloid; gloeocystidia none; dendrophyses none; there are, however, in place of dendrophyses, large smooth spherocysts all over the surface portions of the carpophore; all elements hyaline in NH_4OH.

This in the type, Leprieur 691, from French Guyana (PC) and corresponds closely to Montagne's description even including the smooth cells of the surface, a feature practically discounted as an error by most authors, and the assumption that "this is not an

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orange species as they seem to think in Berlin" (Lloyd) seems to be correct after all. This is a very distinctive species among the representatives of section *Anechinus* Sing. It is not, as I believed formerly, either the same as *F. flava* or *F. sabalensis*. It is not even related with these species.

Laschia longicellulis. Lloyd, Mycol. Notes **5**: 837. 1919.

Spores 7.5 ⇌ 5.3 μ, amyloid, smooth; basidia 26—32 ⇌ 8.5—9.5 μ; gloeo-vessels and gloeocystidia very numerous, in cresyl blue with very thin almost indistinct walls and strongly bluing and guttulate; dendrophyses present, the majority strongly vesiculose, 23—31 ⇌ 9.5—22 μ, few thin and subcylindrical (about 5 μ diam.), all without contents of any kind, spinules 1.3—2 μ long, more often about 1.3 μ than 2 μ.

This is the type from the Lloyd Herbarium (BPI), kindly sent by Dr. Stevenson. It is apparently a synonym, not of *F. saccharina* but of *F. pygmaea* (Speg.) Sing. (cf. Lloydia 13: 254. 1950).

Agaricales: Hygrophoraceae.

Camarophyllus Kummer.

Hygrophorus umbrinus Dennis.

Spores globose, hyaline, smooth, nonamyloid, 4.7 ⇌ 4.5 μ; basidia 42 ⇌ 6—7.3 μ (the 4-spored ones), and 4.3 μ broad (the 2-spored ones); hymenophoral trama with irregularly interwoven lateral stratum and more axially arranged mediostratum, the latter pale melleous-umbrinous, the former hyaline; cuticular hyphae densely interwoven and irregular, 3 μ in diam., with umber mebranal pigment; all hyphae with clamp connections.

This is a good *Camarophyllus* although the deeper colored more regular central strand of the hymenophoral trama may suggest a *Hygrophorus* s. str. It would be necessary to have still younger material in order to be certain that the lateral stratum is never divergent. But all other characters seem to agree with *Camarophyllus*.

Hygrophorus hymenocephalus Sm. & Hesler sensu Dennis.

Spores 5.7—5.8 ⇌ 5.2 μ, hyaline, nonamyloid, smooth; basidia 23—29 ⇌ 5.5—6 μ; hymenophoral trama stramineous, consisting of hyphae of unequal diameter, some rather broad (to 11 μ), with sometimes slightly thickened walls (to 0.4 μ), showing a distinct axillar arrangement but somewhat interwoven; subhymenium of small elements present; epicutis above strands of repent filamentous hyphae formed by a hymeniform layer of vesiculose pedicellate cells; all hyphae nonamyloid, with clamp connections.

This is the collection from Trinidad (K) representing Dennis's interpretation of the North American species. I have also studied the type of the latter (MICH) and, because of the relatively somewhat shorter basidia and the absence of clamp connections, inserted it,

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together with some other clampless *Camarophylli,* in the genus *Armillariella* inasmuch as I am convinced that the less irregular trama of this group, intermediate between that of *Camarophyllus* and *Hygrocybe,* shows that it is generically different from both these genera. While this latter statement seems to be correct, it was A. H. Smith's opinion that the species concerned should not be removed from the *Hygrophoraceae**). Dennis' species, differing from the original type only (as far as important characters are concerned) in the presence of clamp connections, seems to decide the controversial subject in favor of A. H. Smith's opinion. Until and unless a new generic name is proposed for the species with either hymeniform epicutis or clampless hyphae (or both), no new name is proposed for the tropical species, analysed above.

Hygrophorus nodulisporus Dennis.

Spores 9.8 ⇌ 7.5 μ, hyaline, with projecting subcylindric to long-conical spines (about ten in optical section), nonamyloid; basidia 38—57 ⇌ 9—9.5 μ; hymenophoral trama with a central strand of fuscous non-gelatinous slightly interwoven hyphae, and a hyaline lateral stratum consisting of thin filamentous hyphae, ± diverging toward the hymenium, and imbedded in a gelatinous mass; hyphae of the epicutis repent and filamentous, with a very slight pigment incrustation on the walls of some hyphae; all hyphae without clamp connections.

This is the type from Trinidad, a very distinctive species (K), undoubtedly a representative of the *Hygrophoraceae,* but differing from all other known *Hygrophoraceae* in stellate spores; in addition, this species has another unique correlation of important characters, viz. bilateral trama and hyphae without clamp connections. Under these circumstances, it appears to represent a thus far monotypic tropical genus of the family *Hygrophoraceae* which we propose to recognize as a new genus:

Hygroaster Sing. gen. nov.

Hygrophoracearum genus; lamellis crassiusculis; velo nullo; tramate hymenophorali bilaterali; hyphis omnibus defibulatis; sporis stellatis. Typus generis: **Hygroaster nodulisporus** (Dennis) Sing. comb. nov. (*Hygrophorus nodulisporus* Dennis).

Tricholomataceae.

Clitocybe Kummer.

Omphalia bicolor Baker & Dale, Comm. Mycol. Inst. Mycol. Pap. 33: 91. 1951.

The type is in good condition. Spores 4.5—5.2 ⇌ 3.8—4.5 μ, hyaline, smooth, inamyloid; epicutis of the pileus consisting of smooth, repent,

*) Cf. also Sydowia **8**: 304, 1954.

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hyaline to melleous, non-incrusted hyphae; all hyphae non-gelatinized, non-amyloid, with clamp connections.

This is the type from Trinidad, (K). The macroscopical characters of this characteristic species, together with the data obtained from the type, show clearly that Dennis was correct in transferring the species to *Clitocybe*. Whether or not this can be done in the form proposed by Dennis as *Clitocybe bicolor* (B & D) Dennis depends on the nomenclatorial status of Murrill's "new combinations" given as an appendix to his descriptions of new species in American Code nomenclature. The author is inclined to believe that these combinations should be considered as validly published rather than alternative names, and, consequently, considers *Omphalia bicolor* B. & D. as a homonym of Murrill's binomial. The new name **Clitocybe ferrugineoalba** Sing. nom. nov. is therefore proposed for Baker & Dales's species.

Omphalina cylindrospora Dennis, Kew Bull. for 1952: 494. 1952.

Spores 8—10.3 ⇌ 3—3.2 μ, smooth, nonamyloid, thin-walled, rod-shaped, hyaline; cystidia none; hymenophoral trama of thin-walled, somewhat irregular hyaline non-gelatinous hyphae, with a few slightly thickwalled (about 0.5 μ) ones intermixed; cuticle of pileus macroscopically innately radially fibrillose, consisting of parallel, partly voluminous elongated hyphae, most with a fuscous cell sap, some with fuscous incrustations, repent, thin-walled, smooth, and on top of this structure some erect or ascendant swollen cells, vesiculose bodies, etc., but not forming a continuous layer, also with umber dissolved intracellular pigment; basidia 4-spored; all hyphae non-amyloid, narrowly filamentous to very broad, thin-walled, with a few very slightly thicker walled ones (0.5 μ) intermixed, with clamp connections. The pileus is deeply umbilicate.

This species, the type of which (K) corresponds to the data indicated above, is marginal both in *Clitocybe* and *Gerronema*, although a whole series of species with somewhat irregular trama are known in *Clitocybe* where they seem to have close affinities with more typical species; on the other hand, the radially fibrillose pileus and the characters of the hyphae as well as the habit of the carpophores agree well with *Gerronema* (such species as *G. elasticum*), but it differs in the presence of non-intracellular pigment. Even though there can be little doubt but that this species is not congeneric with *Omphalina*, I prefer to refrain from a transfer at this time, waiting for more data which might make a decision easier in the future.

Collybia Kummer.

Marasmius subprasiosmus Murr., Bull. Torr. Bot. Cl. **67**: 153. 1940.

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Spores 6.8—7.3 ⇌ 3.5—4 μ, smooth, nonamyloid, hyaline; basidia 4-spored; cheilocystidia none seen; epicutis consisting of filamentous smooth, parallel hyphae which form a cutis.

The type collected on a law in northern Florida (FLAS), is well preserved. The species is extremely close to *Collybia cauvetii* (R. Maire) Sing. (*Marasmius cauveti* Mre.), and differs slightly in the manner of striation of the pileus, localization of the pigment, and habitat. It is not related with *M. prasiosmus*.

Collybia brunneosetosa Dennis.

The type, no. 221 (K) has an epicutis of hyaline, strongly deep brown incrusted repent hyphae, forming a cutis; there are occasional very distant slight bulges and nodules and the walls are at places roughened but neither diverticulate nor showing *Rameales*-structure; clamp connections present.

This is therefore a characteristic species of the genus *Collybia* sensu str.

Marasmius coracicolor Berk. & Curt.

Spores few (among innumerable mould conidia) hyaline, smooth, with or without subprahilar depression, ellipsoid, about 5.5 ⇌ 3.8 μ; cystidia none; epicutis of pileus consisting of appressed, smooth hyphae; some broader thicker walled elements in the hypodermium, but none of these with incrusting pigment.

This is the type, Wright 10, (FH), from Cuba. It must be called *Collybia coracicolor* (B & C) Dennis. The pileus of the type is now brown, lamellae tan color, stipe brown with a lighter colored thin velvety-tomentose covering, equal; lamellae close, adnexed, medium broad; pileus striate-sulcate now, quite glabrous, roughened only partly by drying.

Marasmius pulchellus Berk.

Spores not seen; basidia apparently small; epicutis of pileus of smooth hyphae with a brown to melleous incrusting pigment. The pileus is broadly campanulate, cinnamon, with striate-sulculate margin, in dried condition less, in soaked condition more than 10 mm broad; the stipe is very thin, brownish, slightly pruinose, especially at apex, equal; lamellae subclose, adnexed, not very broad, close; hyphae non-amyloid, with clamp connections.

This is the type, Spruce no. 99 of which there are three mounts of carpophores (K) which seem to be identical with each other. This is a *Collybia*, **C. pulchella** (Berk.) Sing. comb. nov.

Paxillus retiarius Berk.

Spores 5.3—6 (6.5) ⇌ 3—4.5 μ, nonamyloid, smooth, hyaline; cystidia none; hymenium now yellowish; epicutis of elongated, smooth, hyphae, not with *Rameales*-structure, with an occasional side-branchlet, but never diverticulate. Base with mycelial strigose fibers which are white; hyphae non-amyloid, with clamp connections.

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This is the type, Spruce 611, (K), from "Panuré" (Ipanuré = São Jeronimo), Brazil. The lamellae are strongly intervenose and almost subporoid, and thus remind one of *Collybia plectophylla* (Mont.) Sing. Since the type of the latter (FH) which is the lectotype material of the holotype, did not yield any spores, it is not impossible that it actually belongs to the small-spored species, described as *Paxillus retiarius* by Berkeley. However, as long as it has not been proved that *P. retiarius* occurs in French Guyana where Leprieur collected while *C. plectophylla* sensu meo does not, I feel that my interpretation should stand. The interpretation of the Montagne species given by Heim and Dennis refers to a *Mycena* and may or may not be represented in the original assemblage of material, yet it does not correspond with the lectoholotype. On the other hand, it seems that *Marasmius argentinensis* Speg. with spores 6.8 ⇌ 3—4.3 µ might be the same species as that described by Berkeley as *Paxillus*. The latter should be known as **Collybia retiaria** (Berk.) Sing. comb. nov.

Marasmius semisquarrosus Berk. & Cooke.

The type specimens at K are identical with those of *Marasmius spongiosus* Berk. & Curt. which is *Collybia spongiosa* (Berk. & Curt.) Sing. (= *Marasmius semihirtipes* Peck). It comes from Gainesville Fla., where I have collected it frequently since it is one of the commonest Collybias there.

Gerronema Sing.

Omphalina euomphalus var. *lutea* Dennis.

All macro- and microscopical characters of the type (K) coincide closely with the characters of *Marasmiellus icterinus* Sing. However, in view of the new genus *Gerronema,* it seems best to transfer the species of *Marasmiellus* sect. *Xanthophylli* Sing. to *Gerronema,* inasmuch as this makes it easier to separate the mycenoid species of *Marasmiellus* from the marasmioid ones, if such a separation (of *Marasmiellus* sensu str. and *Hemimycena*) is desired. The new combination **Gerronema icterinum** (Sing.) Sing. (*Marasmiellus icterinus* Sing., *Omphalina euomphalus* var. *lutea* Dennis) is proposed.

Tricholoma Kummer.

Tricholoma glaucoalbum Sing., Sydowia **2**: 28. 1948.

A comparison of the type with certain collections made by the author in 1953 in northern Michigan seems to show that a continuous series of forms connects *Clitocybe odora* with *Tricholoma glaucoalbum.* Under these circumstances, it seems best to transfer this species to *Clitocybe,* without giving it a binomial in that genus inasmuch as further monographic studies must show whether it can be specifically separated from *Clitocybe odora.* As a logical consequence, the section *Glaucoalba* Sing. and the subgenus *Fibulocutis*

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Sing. in *Tricholoma* should be abandoned. In view of the data given under *Hygrophoraceae* (above), it is also probable that the section *Marginata* Sing. and the subgenus *Humidicutis* Sing. in *Tricholoma* should be abandoned, but no definite arrangements for the species concerned can be made as long as they cannot be disposed of in the family Hygrophoraceae, a situation which will be dealt with in a forthcoming paper.

Tricholoma acre Peck.

Melanoleuca subacris Murr., Lloydia **5**: 142. 1942.

The types (NYS and FLAS, respectively) of both these species refer to the same species, rather frequent in the United States, and characterized by slowly acrid taste and 6—8.7 (11.5) ⇌ 4—6 μ large nonamyloid spores, the presence of versiform cheilocystidia, and a cutis of parallel, septate, non-incrustated cylindrical hyphae (rarely with some subhyaline incrustations). There is also material collected by the author and compared with topotypic and authentic (same collector, G. E. Francis, no. 89, from Worcester, Mass., FH) material from which some chemical reactions of the flesh were obtained: Phenol: negative. $FeSO_4$: negative. Metylparamidophenol strongly positive (deep purple). This material was gathered at Harvard, Mass. Oct. 5, 1946 in a mixed wood of *Betula, Tsuga* and *Pinus*. The pileus was "piping rock" to "traprock" (M & P). It is preserved at FH.

Melanoleuca adusta Murr., J. El. Mitch. Soc. **55**: 370. 1939.

Spores 5—6.8 ⇌ 3.5—3.8 μ, smooth, hyaline, with very thin wall, with one oil droplet, nonamyloid; basidia 24 ⇌ 6.7 μ, 4-spored; cystidia none; hyphae of cuticle repent and subparallel with brown walls but without incrusting pigment, often contracted at septa; hyphae nonamyloid, without clamp connections.

The type (FLAS) is a typical *Tricholoma* in spite of its small size.

Porpoloma Sing.

Tricholoma griseum Dennis.

Spores 7.2—7.3 ⇌ 4.5—4.8 μ, amyloid, smooth, hyaline, thin-walled, smooth, ellipsoid; pleurocystidia 44—45 ⇌ 6.5—10.5 μ, hyaline, thin-walled, only rarely apex somewhat thick-walled, long-subclavate or cylindrical with or without subcapitate apex; cheilocystidia numerous, broadly cylindrical to subventricose; epicutis of pileus consisting of parallel repent hyphae forming a cutis, occasionally a strand of parallel hyphae subascendant and then the terminal hyphal cell shortened, subellipsoid; pigment incusting the epicuticular hyphae; hymenophoral trama consisting of parallel, hyaline, thin-walled, nongelatinous filamentous hyphae, regular; all hyphae with clamp connections, nonamyloid.

This is the type (K). It comes close enough to the subantarctic genus *Porpoloma* but differs from the species of that genus in the

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presence of pleurocystidia. It differs from all species of *Tricholoma* by having distinctly amyloid spores, pleurocystidia, and clamp connections in a non-interwoven pileus cuticle. The final generic position of this fungus must be left undecided for the time being.

Dermoloma (Lange) Sing.

Tricholoma atrobrunneum Dennis.

Spores 5.3 ⇌ 4.5 µ, amyloid, smooth, hyaline, short-ellipsoid; basidia 4-spored; cystidia and cheilocystidia none; hymenophora trama regular, of parallel filamentous hyphae; epicutis of the pileus formed by an epithelium consisting of a single layer of globose to subglobose pedicellate cells, hymeniform, the cells fuscous from a membrana pigment and slightly incrusted in places, all hyphae hyaline, smooth, filamentous an trama, with clamp connections.

The type (K) is a good representative of the genus *Dermoloma*, a genus close to *Cantharellula* and *Porpoloma*, and characterized by its amyloid spores, absence of cystidia and cheilocystidia, presence of an epithelium and clamp connections. The type species of the genus is *Tricholoma cuneifolium* (Fr.) Gill. sensu Lange which is apparently also the same as that of Josserand and Kühner & Romagnesi. The new combinations **Dermoloma atrobrunneum** (Dennis) Sing. and **Dermoloma cuneifolium** (Fr.) Sing. are proposed. The genus was at first accepted ad interim in Lilloa **22**: 250. 1949 (1951), but should be accepted definitively.

Hohenbuehelia Schulz.

Agaricus (Crepidotus) phalliger Mont.

Spores ellipsoid to somewhat saussage shaped, 8—9 ⇌ 3.5—4.2 µ, hyaline, smooth, nonamyloid, thin-walled; cheilocystidia versiform (subcylindrical, subcapitate, or ampullaceous) with transitions to the metuloid type; metuloids numerous, strongly incrusted with crystals especially at the apex, obtuse or with a neck-like outgrowth at the apex, more rarely acute, stramineous, 35—42 ⇌ 7—16 µ, with very thick walls. The surface looks somewhat like that of *H. atrocaerulea* with which it is undoubtedly most closely related, in the back region particularly distinctly fuzzy-rough on darker ground; lamellae close but not crowded and narrow, entire.

This is part of the type, the „3me envoi" from Valdivia, coll. Gay (PC). There is also the second „envoi" which is identical. The data given above show that this is the same species as the one described by Singer & Digilio under this name (Lilloa **25**: 114. 1951).

Asterotus Sing.

Panus sprucei Berk.

Panus bicolor Mont.

Spores 6.5—7.3 ⇌ 3.3 µ, smooth, hyaline, nonamyloid; basidia normal; cystidia none; hyphae imbedd in gelatinous mass; in hymeno-

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phoral trama equally gelatinized as in trama of pileus, with a non-gelatinized subhymenium and a non-gelatinized subhypodermial layer above which there is a homogeneous cuticle of typical astrostromelloid structure as seen in *A. dealbatus*. Lamellae now neutral gray to deep brown, with brownish stipe, and now dull gilvous whitish (but originally, when fresh, "lividus, siccicate gilvus albescens", according to collector's notes, *Panus sprucei*) pileus which is sulculate and glabrous at margin and velutinous and depressed behind; lamellae narrow and deeply decurrent.

P. sprucei (K) comes from São Jeronimo (Panuré), and *P. bicolor* (PC) from French Guyana. They are identical with each other, and belong to *Asterotus* Sing. The new combination **Asterotus bicolor** (Mont.) Sing. is proposed.

Phyllotopsis (Gilb. & Donk) Sing.

Tilotus lenzitiformis Kalchbr., Grevillea **9**: 137. 1881.

The type (K) is undoubtedly an agaric. It was collected at the Cape, M c O w e n 1401, and has now an annotation by "GWD" stating that it is *"Claudopus nidulans"*. Macroscopically, this determination seems to be probable. On the other hand, the specimen does not contain any spores except a few (perhaps of foreign origin) which are shorter than those of *P. nidulans*. The description given by Kalchbrenner is inaccurate. The lamellae are entire and glabrous, not in any way remarkable. The tomentum exists but between the pilei. This was "not yet studied out" and apparently prematurely published, and is, as far as the original description is concerned, a "nomen subnudum ad int". However, S a c c a r d o published the same text again without making it appear that it was a provisorium. I f it is considered that S a c c a r d o validated the description and if it may be considered permissible to identify this exotic species without spores as *Phyllotopsis*, then one may argue that *Tilotus* antedates *Phyllotopsis*. Since the answer to both these questions is not likely to be in the affirmative, I refrain from making any further comments.

Pleurotus Kummer.

Panus levis Berk. & Court.

Since older carpophores of this species are naked and show no trace of a veil, it may be of interest that the type specimens at Kew do show traces of a veil. This proves that the species described by K a u f f m a n as *Pleurotus corticatus* is actually *Pleurotus levis* (B & C) Sing. Fresh material (from Douglas Lake, Cheboygan Co., Mich., coll. & det R. S i n g e r, F) has pale cream colored (between A and B of C r a w s h a y) spore print.

Pterophyllus bovei Lév.

The type from Egypt is preserved at PC and a fragment also at K. Bresadola left an annotation saying that this is a *Pleurotus* rather

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than a new genus. It looks very much like a true *Pleurotus* but the anatomy of the lamellae is hard to establish since they are somewhat damaged by insects, a feature that also caused the slight thickennings at the edge which caused Léveillé to describe it as a new genus. It is supposed to be identical with *Agaricus fici* Lév. The generic name *Pleurotus* is not in nomenclatorial danger since it is one of the nomina conservanda.

Panus concavus Berk.

The type from Santo Domingo exists in two portions (or more), constituting the type collection. The holotype is preserved in the Berkeley Herbarium (K) and syntypes were sent from the Boissier Herbarium to Patouillard and came with the Patouillard Herbarium to Harvard (FH). Both portions are identical with each other and were carefully studied since they are the type not only of this species but also of the genus *Lentodiellum.*

Spores (5.5)6.7—7.7(8) ⇌ (1.7)2—2.5(2.7) μ, hyaline, cylindrical or cylindrical-oblong, smooth, non-amyloid, with a flat inner side or with suprahilar applanation or depression; basidia 23—24 ⇌ 4—4.5 μ; cystidia none; occasional cystidioid hyphae breaking through the hymenial layer, and occasional basidioles transformed into fusoid cystidioles; subhymenium very distinct, brownish pallid, strongly taking up dye, irregularly interwoven, consisting of small filamentous elements; hymenophoral trama not sharply divided into a medio- and lateral stratum, but near the subhymenium definitely showing an exillar trend, consisting of rather thin strongly interwoven hyphae, further toward the central strand more and more irregular, running in all directions, strongly interwoven, and often more or less thick-walled; all hyphae non-amyloid, with clamp connections, some thin-walled, some definitely thick-walled. The base of the stipe is not too well preserved in the FH portion (broken off) and little better in the K portion. No veil could be seen. The lamellae are close but not very close, crowded.

The genus *Lentodiellum* is based on this species. Since the analysis of the type shows the latter to be a *Pleurotus, Lentodiellum* becomes a synonym of *Pleurotus.* On the other hand, a very similar but obviously different species was described as *Lentodiellum concavum* by Dennis (Kew Bull. 1950: 332. 1950). The material on which this description was based (K) is in excellent condition. It differs from *Panus concavus,* type, in having crowded lamellae, a common scaly white base from which about a dozen individual stipes and pilei arise; habitat on a manure heap. Spores much smaller and relatively broader than in the type, 4.7—5.2 ⇌ 2.2—3 μ, hyaline, smooth, non-amyloid; basidia 20 ⇌ 3.8 μ, 4-spored, cystidia none; subhymenium poorly developed, practically absent; hymenophoral trama consisting of thin-walled, filamentous, slightly interwoven hyphae,

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hyaline, non-gelatinized, regular or subregular; cuticle of the pileus dense, consisting of smooth filamentous hyaline hyphae; all hyphae with clamp connections, non-amyloid.

Since this is not identical with *Panus concavus,* it has to be renamed. It is certainly a *Clitocybe,* but not identical with any of the pleurotoid Clitocybes known, such as *Clitocybe pleurotus, C. aberrantissima,* etc., but it may hide under Rick's *„Pleurotus fimbriatus* Bolton" which, however, is not polypilous or fimicolous. We redescribe it as *Clitocybe augustinensis* in a forthcoming paper.

On the other hand, we believe the type collection to be a good species of *Pleurotus,* and transfer *Panus concavus* Berk. to *Pleurotus* as *P. concavus* (Berk.) Sing. (*Panus concavus* Berk., Ann. Mag. Nat. Hist. II, 9: 194. 1852). This species is undoubtedly very close to *Pleurotus hirtus* (Fr.) Sing. (See Type Studies on Basidiomycetes V, Sydowia **5**: 446. 1951), but differs in being glabrous. It does not show much similarity with *Pleurotus prometheus* with which it would key out. If Murrill, who attributes a veil to this species, were right, one may also compare *Pleurotus sajor-caju* (Fr.) Sing. and *Pleurotus rickii* Bres. However, the first one has a different aspect in dried condition, and seems to be restricted to the Old World tropics, while the latter differs in the color of the pileus. There is, however, no evidence that the typical *Pleurotus concavus* ever has a veil.

Lentinus Fr.

Agaricus boryanus Berk. & Mont., Ann. Sciences Nat. Bot. ser. 3, **11**: 235. 1849.

Spores none seen; basidia small, clavate, 17.5 ⇌ 3 μ, 1-, 2-, 3- and (mostly) 4-spored; cystidia none; hymenophoral trama regular, consisting of broad (to 14.5 μ), mostly thick-walled filamentous hyphae (wall e. gr. 2 μ thick); subhymenium poorly developed and very thin; trama of pileus irregularly arranged and more or less gelatinized, consisting of thick-walled hyphae; epicutis nongelatinized, consisting of denser thinner hyphae; some of the hyphae seem to adsorb iodine from the Melzer on the inner surfaces of the walls, but only very slightly so, nonamyloid, with clamp connections; basidioles often subampullaceous (cystidioles?). Macroscopically very similar to the type of *Lentinus cubensis.* Lamellae crowded; stipe rather hard, tending to dark brown below, lamellae tending to separate from apex of stipe, stipe slightly eccentric, subinsitious.

This is the type from Bahia, Brazil, (K). In spite of the fact that the gelatinization of the pileus trama has not been observed in North American material, I think the original description, the data given above, and the aspect of the carpophores preserved corroborate Murrill's opinion about the identity of *A. boryanus* with *Lentinus cubensis.* Consequently, Montagne's epithet having considerable

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priority, I propose the new combination **Lentinus boryanus** (Berk. & Mont.) Sing.

Agaricus ixodes Mont., Ann. Sc. Nat. ser. 4, **1**: 95. 1854.

Spores 5.5 ⇌ 2.5 µ, hyaline, cylindrical, nonamyloid, smooth; basidia small, clavate; cystidioles fusoid, acute, inconspicuous; hymenophoral trama consisting of thin and thinwalled, often sligthly spiralling wavy hyphae which generally run in axillar direction, but later (FH material) intermixed with thickwalled mostly subparallel hyhpae which are no more than subgelatinous (where the thickwalled hyphae are few or absent, the trama may be termed gelatinous); pileus trama also gelatinized but here hyphae running in all directions; cuticular layer definitely not gelatinized, consisting of smooth, filamentous, thin hyphae, dense. When compared macroscopically with *Lentinus cubensis,* it appears to be identical. All hyphae are nonamyloid, with clamp connections.

This is the type, Leprieur no. 982, FH, K. The specimen analysed in the Kew Herbarium seems to be sligthly younger than the one from the Patouillard Herbarium (FH). The latter is almost indistinguishable from the type of *A. boryanus.* We draw the conclusion that young specimens of this species (*Lentinus cubensis,* or — recte — *Lentinus boryanus*) have a tendency to be strongly gelatinous in young hymenophoral trama, and more or less gelatinous in the pileus trama. The surfaces are never gelatinous, and the carpophores of *A. ixodes,* type, could not possibly have been glutinous even in youth. I consider *A. ixodes* as a synonym of *Lentinus boryanus.*

Panus leprieurii Mont., Ann. Sc. Nat. IV, ser. 1: 121. 1854.

The part of the type, deposited in the Patouillard Herbarium, FH, is obviously the same as *Lentinus boryanus,* only somewhat discolored and smaller.

Oudemansiella Speg.

Agaricus radiculosus Cooke.

The type, Glaziow 9149, from Rio de Janeiro, has all the micro- and macroscopical characters of *O. canarii* and is a synonym of the latter. This observation coincides with an annotation by Dennis, who also found *Tricholoma albosquamatum* Beeli to be synonymous with this pantropical species. These two additional synonyms have to be added to the list already given by the author (Mycologia **37**: 437—437. 1945, with description of *O. canarii*). Further type studies see Lilloa **23**: 185. 1950 and **26**: 67. 1953.

Agaricus napipes Hook. fil.;

Agaricus olivaceoalbus Cooke & Maas.

The two species are certainly identical with each other, and have the suddenly thinned pseudorhiza, the large size of the carpophores, and the large size of the spores in common:

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Spores 16—21.8 ⇌ 10—13 μ, hyaline to pale stramineous, smooth, rather thickwalled to thin-walled, nonamyloid; basidia and cystidia as in *O. radicata*. Epicutis hymeniform. Clamps present.

The type of *A. napipes* (from Sikkim, K) and that of *A. olivaceo-albus* (Wehl no. 3, under Casuarinas, Lake Bonney, S. Australia, K) are also identical with a specimen collected by L. W. White in Cambridge Mass. This as viscid, very large, with very thin pseudorhiza on a grassy lawn on buried wood, June 25, 1942, with odor of *Palargonium* leaves, but with spores only 16—18 ⇌ 10—11.5 μ. I do not think that the three are different from *O. radicata* unless the latter is split up into microspecies.

Agaricus alveolatus Kalchbr.

Spores with rather thin walls, subhyaline, 14.5—17.5 ⇌ 10—13 μ; basidia and cystidia as in *O. radicata,* melleous-hyaline, the latter e. gr. 42 ⇌ 17.5 μ.

The type was collected by McOwen at the Cape of Good Hope, South Africa, K. This is a synonym of *O. radicata.*

Hygrophorus gigasporus Cooke & Mass.

Spores 12.3—15.3(21) ⇌ 10.3—11.7(15) μ, otherwise as above.

The type from Port Philipp, coll. French (K) is synonymous with *O. radicata.*

There is, however, in New Zealand, a similar form but with spores subglobose, smooth, hyaline, thin- to thick-walled, 13—15.3 ⇌ 11—13.5 μ, i. e. markedly shorter than in the European and North American *O. radicata*; basidia 45—52 ⇌ 13—14.3 μ; otherwise I could not discover any appreciable difference from *O. radicata* and the species analysed above. This is a specimen deposited at the Kew Herbarium with the determination „*Pluteus phlebophorus* Ditm. prox." Whether this should be treated as a variety of *O. radicata,* or as a new species cannot be decided at the present time.

Xerula R. Maire.

Agaricus aureotomentosus Kalchbr. in Kalchbr. & Cooke, Grevillea **9**: 17. 1880.

The type of this species from Port Natal (PC) seems to be identical with *Xerula chrysopepla* (Berk. & Curt.) Sing. This species appears to have a similar distribution as compared with *Heimiomyces tenuipes.*

Mycenella (Lange) Sing.

Collybia mycenoides Dennis.

Spores 8 ⇌ 4.8 μ, smooth, hyaline, with moderately thin walls, nonamyloid, broadest in the hilar region with rather strongly developed hilar appendage but not so strong as in most Mycenellas, tapering toward the rounded apex, with a slight suprahilar depression; cystidia ventricose below, ampullaceous with rounded apex which

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is thin-walled, otherwise remarkably thick-walled (wall 3 μ thick), about 66 ⇌ 20.5 μ, pedicellate, very slightly amyloid, beautifully metachromatic in cresyl blue mounts, viz. rose-purple except for the (thinner walled) apex and base which are weakly metachromatic; hyphae of the trama hyaline, with clamp connections, very weakly amyloid to nonamyloid, slightly metachromatic cresyl blue mounts but still strongly contrasting with the thick-walled portion of the cystidia; epicutis of pileus consisting of ascendant to more rarely erect hyaline to umber, broad-cylindrical, cystidioid bodies emerging at intervals from the cutis which forms the hypodermium consisting of rather voluminous hyphae with deep umber cell sap, somewhat interwoven to subparallel, beneath more densely packed and non-gelatinized, pigment-less, and sometimes sligthly thick-walled.

The type from Trinidad (K) has the aspect of a *Mycena,* as is also expressed in the specific epithet chosen by Dennis. The characters of this species make it very difficult to dispose of it in a satisfactory way. Since the only species known to me and showing a comparable structure is, in view of its subglobose to globose spores a true *Mycenella* (in spite of the absence of spore ornamentation), I believe that, at present, this species should be considered a *Mycenella* also.

Marasmiellus Murr. *)

Marasmius alliiodorus (Bertero) Fr.

Spores none seen; cystidia none on sides of lamellae; epicutis of pileus with distinct *Rameales*-structure. Lamellae somewhat intervenose in some carpophores, white, distant or subdistant, adnate to decurrent. Stipe with equal or sligthly attenuated base, whitish to (especially below) brownish (not gray-brown), subpruinose, glabrescent, insititious on fallen branches.

There are three collections, two from San Juán Fernandez (one of these from the Montagne Herb., one from the Hooker Herbarium), and one from San José, Valdivia, Chile. All three seem to be identical. The species belongs undoubtedly to *Marasmiellus* and the combination **Marasmiellus alliodorus** (Bertero) Sing. is proposed.

Marasmius atroviridis Ber. & Curt., J. Linn., Soc. Bot. **10**: 295. 1869.

Spores short ellipsoid, 5—7.5 ⇌ 4—6 μ, hyaline, smooth, nonamyloid; hyphae of the regular gill trama nonamyloid; hypnae of the poorly preserved epicuticular layer possibly of *Rameales*-structure (?); hypodermium forming a cutis, consisting of filiform,

*) This genus is here treated in the narrower sense i. e. without the element formerly known as *Hemimycena* (Sing.) Sing., and without the section *Xanthophylli* Sing. (see under *Gerronema*).

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somewhat pigment-incrusted (but this may be due to an artefact) hyphae.

This is authentic material, Wright, F. C. W. no. 100, (LPS) which agrees with the type but shows more spores. Further notes on the type see Dennis, Kew Bulletin for 1951: 389. 1951. This is apparently identical with *Collybia viridis* Rick and should be known as **Marasmiellus atroviridis** (B. & C.) Sing. c. n.

Marasmius brasiliensis Berk. & Mont.

Spores not found; trama nonamyloid, epicuticular hyphae diverticulate; surface of stipe formed by undulate, forked and diverticulate hairs, with numerous entire ones intermixed.

This is the type, (K), from Bahia, Brazil, with subdistant lamellae, with some lamellulae, with the stipe distinctly covered by a pruinate-tomentose layer, more glabrescent above but not quite glabrous, slightly tapering upward, now gray at base and light reddish brown above, insititious. This is undoubtedly a species of *Marasmiellus*, **M. brasiliensis** (Berk. & Mont.) Sing. comb. nov. The species described under the name *Collybia brasiliensis* by Dennis from Trinidad, no. 252, (K) does not seem to be the same; but it is apparently correctly determined as *Collybia*.

Marasmius calami Petch, Trans, Brit. Myc. Soc. **31**: 38. 1947.

Type material coincides well, in all visible characters, with Petch's diagnosis and with obviously identical material from Venezuela:

Pileus white or cream white (with a greenish tinge acc. to Petch), very finely pruinose when seen under a lens, sulcate, 4—10 mm broad (fresh, up to 20 mm acc. to Petch), — Lamellae white, dried yellowish, rather thick, distant, broad, often forked or with more or less venose interlamellar spaces, rounded to adnate, with lamellulae. Spore print white, appearing yellowish now on black paper. — Stipe varying from strongly eccentric to sublateral or even absent, very short and very strongly curved, where by the pileus is also attached laterally or with an eccentric point of the pileus surface. — Context white, thin.

Spores 13—18 ⇌ 4.3—5(6) µ, smooth, subulate to subulate-clavate and often slightly curved like *Fusarium*-conidia, or else cylindrical, hyaline, nonamyloid; basidia and sterile basidia (cystidia?) clavate, the latter somewhat opalescent; hyphae of the trama hyaline, nonamyloid, with clamp connections; not gelatinized; epicutis of pileus with a very distinct *Rameales*-structure of diverticulate elements at the surface; cheilocystidia filamentous to somewhat swollen at places, wavy to nodose or with side branchlets, or forked, numerous but intermixed with some basidia, 36 ⇌ 3.5—4.2 µ (if filamentous).

The type was collected on dead stems of *Calamus*, Peradynia, December 25, 1923; the South American material was collected by G. W. Martin, Hacienda Cincinnati, 1250—1500 m elev., on bark,

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Sierra de Santa Marta, Dep. Magdalena, Venezuela, Aug. 18, 1935. The correct name for this characteristic species (because of the large spores) is **Marasmiellus calami** (Petch) Sing.

Collybia castaneidisca (Murr.) Murr.

Spores 8.5—9 ⇌ 3.5—3.8 μ, hyaline, smooth, cylindrical, nonamyloid; cystidia moderately numerous, ventricose or ventricose-subcapitate, hyaline; epicutis of pileus with diverticulate elements, many hyphae of cuticle with incrusting pigment. Stipe velutinous, not insititious. Lamellae almost free, close. Pileus innately radially fibrillose and rather large.

This is undoubtedly a species of *Marasmiellus* closely related with *Marasmiellus fascicularis* Rick ex Sing. from which it differs in pigmentation (incrusting pigment) and larger spores. The analysis was made from part of the type collection (IA). The new combination **Marasmiellus castaneidiscus** (Murr.) Sing. is proposed.

Marasmius gilvus Pat., Bull. Soc. Mycol. Fr. **9**: 125. 1893.

Collybia gilva (Pat.) Sing., Lilloa **22**: 201. 1949 (1951).

Spores 7(10) ⇌ 3.3(4) μ; basidia 21—28 ⇌ 7.7—9 μ, 4-spored; basidioles fusoid, 21—28 ⇌ 6 μ; tramal hyphae with slightly (0.5 μ) thickened walls at places, 2—6.5 μ thick; cuticle of pileus showing a distinct *Rameales*-structure with nodose erect bodies; cheilocystidia ramose or strongly ramose-diverticulate-forked; clamp connections numerous; both spores and hyphae are nonamyloid.

This is the paratype from Quito, Ecuador, coll. Lagerheim, February 1892, FH. I have studied the type which is in less favorable condition and I concluded that the species belongs in *Collybia*, which is an error. Recent collections caused me to revise the analysis of the type and the „cotype" and to compare them with material from Panamá:

Marasmiellus gilvus. (Pat.) Sing. comb. nov.

Pileus almost fuscous bister in the center and gilvous pallid on margin, or more gilvous all over, glabrous to innately fibrillose, convex papillate in the centrally stipitate primordia, soon repand, with or without an umbo, and becoming slightly to strongly eccentric, 2—5 mm broad. — Lamellae concolorous with the margin of the pileus, with concolorous, entire edge, distant or subdistant, regularly didymous (5—9 through-lamellae), adnexed or sinuate-adnexed, more or less flocculose at edge, narrow to broad, sometimes one forking. — Stipe at first (primordia) longer, soon becoming as long or shorter than the pileus diameter and eccentric, brownish, pruinate then glabrescent, with thickened base or more rarely equal, often curved at maturity, insititious, 1—2.5 ⇌ 0.5 mm. — Context whitish.

Spores 7—8 ⇌ 3.8—4 μ, ellipsoid, nonamyloid, smooth, thin-walled, hyaline; basidia 21—28 ⇌ 7—9 μ; cystidia on sides of lamellae none; edge with strongly ramose, forked, nodose, or diverticulate

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cheilocystidia; epicutis of pileus of filamentous hyphae which are forming a cutis, the uppermost ones forked, nodose, or diverticulate; hypodermium consisting of radially arranged filamentous hyphae forming a cutis, with thin walls, with fuscous incrusting pigment (an artefact?), and with pale yellowish gray dissolved intracellular pigment, with smooth wall, subparallel; all hyphae with clamp connections, those of the gill trama hyaline, filamentous, not gelatinized, nonamyloid.

On branches of a dicotyledonous tree, Martin no. 3921, (F, IA) and on small rotting branchlets, Lagerheim (FH), always more or less gregarious, from Panamá to Ecuador.

Dictyoploca guadelupensis Heim sensu Dennis.

Spores 7.3—9 ⇌ 4.7—5.2 μ, nonamyloid, smooth, hyaline; cystidia none; epicutis of pileus with strongly diverticulate repent hyphae and short thin nodose and wavy erect hairs, some of these hairs also diverticulate; hyphae of the trama nonamyloid, hyaline, but filled with a fuscous cell sap in the hypodermium; clamp connections present. There is an abundant white basal strigosity.

This was collected by Dennis and determined *Dictyoploca guadelupensis* with which it seems to agree in many ways. If this is actually the same species as Heim's material from Guadeloupe, it should be transferred to *Marasmiellus* (where it belongs among the species with basal strigosity).

Agaricus hemileucus Berk. & Curt.

Spores 6 ⇌ 3 μ, hyaline, smooth, nonmyloid; epicuticular hyphae appear to be smooth, but hyphae of the surface layer of the stipe are definitely diverticulate; all hyphae with clamp connections, nonamyloid. Lamellae close to crowded. Stipe apparently pruinate, pileus fuscous, paler in center.

This is the type as preserved at K. Unfortunately, the base of the stipe is clipped off and one cannot tell with certainty whether this belongs to the insititious species. A transfer is not proposed until more is known about this species. The interpretation given by Dennis would locate this fungus in *Collybia* (there is a basal fibrillosity and white arochnoid mycelium present at the base and the epicutis of the pileus seems to be made up of filamentous smooth hyphae), but I have doubts whether this is actually conspecific with the type since the lamellae are only subclose and the carpophores smaller.

Marasmius inoderma Berk., Hooker's Journ. Bot. 3: 15. 1851.

Spores (5.8)9—10.3 ⇌ (4.5)6—6.3 μ, nonamyloid, hyaline, smooth; cheilocystidia reminding one of the elements of the epicutis; epicuticular elements strongly diverticulate with erect excrescencies; hyphae all hyaline, with clamp connections, nonamyloid. The stipe is eccentric, the lamellae slightly closer than in some specimens of

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M. semiustus but within the range of variability of that species, subclose to subdistant.

This, the type from Pará, Brazil (Spruce, K) is pressed flat, but recognizable enough and easy to analyze. It is undoubtedly identical with the species called *Marasmiellus semiustus* by me, and the latter name has to be replaced by the earlier one: **Marasmiellus inoderma** (Berk.) Sing. comb. nov.

Marasmius sabali Berk.

The type, from Bermuda, (Challenger Expedition, K), is in good condition. The diverticulations are very strongly developed and often remind one of dendrophyses (in the sense of the term as used in *Favolaschia,* but with relatively elongate setulae and more irregular in size and shape); diverticulate elongate hyphae also numerous, especially near the margin; cheilocystidia similar and numerous but mixed in with basidioles. Spores as in *M. semiustus* (recte: *M. inoderma*). This is a synonym of the latter.

Micromphale luteum Dennis.

Epicuticular hyphae branched and nodose to diverticulate, — a strong *Rameales*-structure; hypodermial hyphae hyaline, nonincrusted; tramal hyphae only slightly gelatinized; spores small, hyaline, nonamyloid; all hyphae hyaline, nonamyloid, with clamp connections; cystidia none. The dried material is umbilicate, myriadeous, with subdistant, adnato-decurrent lamellae and eccentric stipe which is white, mealy, and insititious.

The type, (K), is in good condition, and the analysis shows that it belongs to *Marasmiellus* as **Marasmiellus luteus** (Dennis) Sing. comb. nov.

Marasmiellus omphalodes Berk.

Spores none seen; basidia clavate, basidioles subfusoid; cystidia present, slightly projecting and somewhat opaque, on the sides of the lamellae rather numerous, clavate or clavate-apiculate (with a thin apical appendage), hyaline; hymenophoral trama made up of slightly interwoven hyphae, regular or subregular; epicutis of pileus consisting of repent filamentous hyphae, increasingly more brown from a membrana pigment toward the trama (hypodermium), but no distinct pigment incrustation observed; the outermost layer with distinctly diverticulate hyphae of the *Rameales*-type; hyphae nonamyloid, with clamp connections. The pileus is described as white with umber center (Spruce) and is now slightly convex with somewhat depressed center. Lamellae close, adnato-decurrent. Stipe more or less velvety, equal, rather long, probably insititious.

This is Spruce 131 from „Panuré", the type (K). It belongs in *Marasmiellus,* and should be known as **Marasmiellus omphalodes** (Berk.) Sing. comb. nov.

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„Panuré" is one of the classical collecting places of early Berkeleyan material. Spruce spent some time there. It is not to be found in any modern map. Therefore, it may perhaps be of interest that the correct name of the place is Ipanuré, now known as São Jeronimo, a small town on the Rio Negro.

Marasmius paspali Petch, Trans. Brit. Myc. Soc. **31**: 35. 1947.

The epicutis shows a strong *Rameales*-structure, consisting of irregularly branched diverticulate elements which are partly melleous brownish, partly hyaline; hyphae nonamyloid, with clamp connections. Petch's description is correct, and his figure corresponds well with the specimens (pl. III, fig. 11, l. c.). Identical material was collected by Dennis (no. 132) from Trinidad. Both the Ceylon type and the neotropical collection are preserved at K and were compared.

This species belongs in *Marasmiellus,* and should be known as **Marasmiellus paspali** (Petch) Sing. comb. nov.

Marasmius rubellus Mont., Ann. Sc. Nat. ser. 4, **1**: 115. 1854.

While there are only a few fragments at PC, I had the opportunity to study good type material at FH.

Spores few, 5.2 ⇌ 2.8 μ, hyaline smooth, ellipsoid, nonamyloid; surface layer of both pileus and stipe with distinct *Rameales*-structure, on stipe with thickwalled elements; hyphae nonamyloid. The carpophores are attached to leaves, insititious, have the size of *Naucoria centunculus,* the pileus now being cinnamon tan.

This is Leprieur no. 993. There is another collection, apparently compared with this type by Patouillard, collected by Duss (48 = 49) on *Sloanea caribaea* leaf from Bois des Bains Jaunes, Guadeloupe, (FH) which differs from the type only in more velutinous stipe, especially when seen under a binocular, but the coating is on very dark ground exactly as in the type, and, since all other characters coincide, I think it is the same thing. Here, there are many more spores on the lamellae where the following measurements were obtained: 5.2—5.5 ⇌ 3—3.3 μ.

The species belongs without any doubt in *Marasmiellus,* sect. *Rameales.* It is herewith transferred to that genus as **Marasmiellus rubellus** (Mont.) Sing. comb. nov.

Heliomyces sprucei Berk.

Spores approximately 6—7 ⇌ 3 μ, cylindrical, smooth, nonamyloid; cystidia none; epicuticular layer of the pileus consisting of a very weak *Rameales*-structure, with intermittently nodose hyphae and occasional ramifications, the pigment (where present) localized in the hyphal walls but not distinctly incrusting the wall on the outside; tramal hyphae nonamyloid, with clamp connections, only very slightly gelatinized, irregularly arranged in the context, apparently with airspaces rather than imbedded in a gelatinous mass because visibly looser than in the cuticular layer. Stipe slightly fibrillose below,

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otherwise glabrous, insititious. Lamellae decurrent, distant, not interveined. Pileus strongly sulcate and pallid, deep badious between striae. On small branches.

This is the type (K) from Brazil, Spruce 91. What I think is the same species, was collected and described by Dennis from Trinidad as *Micromphale subavellaneum,* and possibly by Singer & Digilio as *Marasmiellus griseolobrunneolus.* The differences between these three species are so small that it is quite possible that they are all synonyms. The only striking character by which it may be possible to distinguish *M. sprucei* is the radially striped pileus which, in its color distribution reminds one of *Marasmius tageticolor* Berk. Since in the case of the latter species this character was found to be constant in one case, and inconstant in another similar species (*M. haematocephalus* Fr.), it remains to be seen whether it is constant in *M. sprucei.* For the latter, the new combination **Marasmiellus sprucei** (Berk.) Sing. is proposed.

Marasmius subcoracinus Berk. & Curt.

Spores 5.5—6.3 ⇌ 2.5—3.3 μ, hyaline, smooth, guttiform-elongate to ellipsoid-oblong; basidia 16.5 ⇌ 3.8 μ, 4-spored; cystidia none; elements of the epicutis of the pileus interwoven, with strong diverticulation; hypodermial layer consisting of smooth to silghtly diverticulate hyphae, interwoven but forming a cutis, with melleous walls, but not incrusted by pigment; surface layer of pileus consisting of rather thick-walled, erect to ascendant, somewhat pilose, thick hyphae and occasional somewhat smaller thin-walled hyphae, all obtuse above and some wavy-nodulose-irregular, others regular and entire; trama of the pileus consisting of loosely arranged hyphae which are thin and hyaline, possibly somewhat gelatinized; trama of the lamellae as above; trama of the stipe consisting of multiseptate, thick-walled, parallel hyphae. The carpophores look somewhat like *Marasmiellus ramealis*: they have adnate distant lamellae and insititious stipe.

This is the type, Wright no. 22, from Cuba (FH) on fallen branches. It must be transferred to *Marasmiellus* as **Marasmiellus subcoracinus** (Berk. & Curt.) Sing. comb. nov.

Collybia subfumosa Speg., Bol. Acad. Nac. Cienc. Córdoba **11**: 390. 1889.

See my Type Studies IV, Lilloa **23**: 167. 1950 and Type Studies VI, Lilloa **26**: 130. 1953 where a description of Brazilian collections is given. This species is also common in Florida (where it was collected by Murrill under the name *Cvllybia subluxurians* and by the author as *Collybia* spec. and **Marasmiellus subfumosus** (Speg.) Sing. comb. nov. The latter binomial is the correct one). I add a full description of the Florida material:

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Pileus „russet" (Ridgway), then „Mikado brown" to „cinnamon" or with „Verona brown" striae (all R.) on paler ground, with medium to long-striate margin, but almost smooth when mature, varying in some specimens to deeply folded-sulcate, hygrophanous, radially innately fibrillose at least in age or even breaking into lacerate fibrils when old, campanulate-convex to convex-umbilicate when young, then subumbonate to more rarely umbonate and usually umbilicate, eventually flattened, rarely concave, fleshy, 26—60 mm broad. — Lamellae avellaneous-white, soon brownish white or pale brownish, crowded to close, 2.5—3.5 mm broad, i. e. narrow, arcuate, adnate to subdecurrent, eventually often separating from the apex of the stipe; spore print whitish, just off A (Crawshay) not reaching B, and not showing any flesh tinge. — Stipe concolorous with the pileus but covered with a whitish fibrillosity or pruina which may cover the stipe so completely that the latter appears whitish all over, but usually soon at least with „fawn color" to „Mikado brown" (R.) spots, especially near the base where the ground color is deeper, often canaliculate, often somewhat bulbous at base, the apex somewhat grooved in some carpophores, stuffed, later hollow, equal above the bulb (where it exists), the latter sometimes more or less acuminate below, 26—65(130) ⇌ 1.5—4(10) mm (bulb to 9—10 mm in diam.); basal mycelium fibrillose. — Context white to whitish, with an odor of HCN (*Marasmius oreades*), often mixed with a rancid disagreeable smell (but *not* of sauerkraut, i. e. *Micromphale foetidum*).

Spores 5.2—7.8 ⇌ 3—4.7 μ, mostly 5.5—7 ⇌ 3.7—4.2 μ, hyaline, guttiform to ellipsoid, nonamyloid; basidia 21—26 ⇌ (4.3)5—5.8 μ, 4-spored; cystidia none; cheilocystidia clavate, hyaline, very numerous, empty, obtuse, not conspicuous, 20—36 ⇌ 6.8—12 μ; many with irregular excrescencies; epicutis of the pileus fragmentary, i. e. interrupted, but in places well developed and formed by hyphal outgrowths which are ascendant to erect and strongly nodose or with short excrescencies, hyaline, 12—27 ⇌ 4.3—6 μ; hypodermium brownish melleous and sparingly diverticulate where exposed, at places with distinct hyaline to melleous incrustations, consisting of mostly narrow (1—15 μ) hyphae forming a cutis; velvet of the stipe surface formed by a tomentum of ascendant hyphae which are distantly to densely diverticulate and sometimes forked, fragile, stramineous, thin-walled, interwoven; all hyphae with clamp connections and nonamyloid.

On heaps of dead leaves or dead grass in and outside the wooded areas (leaves of *Myrica*, Gramineae, *Persea*), often along the margin of the forest and in plantations, usually very gregarious to cespitose or at least in small crowded groups, fruiting in August, September and October, Alachua Co. south to Dade Co., Murrill (Gainesville, Aug. 18, FLAS), R. S i n g e r (Highlands Hammock State Park, F 504;

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Miami F 1286; Homestead, F 850, all F). Another collection from Massachusetts (R. Singer, Wakefield, sub *Collybia* aff. *subluxurians* and cf. *hygrophoroides*, FH), may be this same species. Its wide distribution makes it possible that it has been described by other authors before Spegazzini, but we are not aware of such a fact. After Spegazzini it was probably described by Murrill at several occasions.

Marasmius subingratus Dennis.

Spores 8 ⇌ 3.8 µ, hyaline, smooth, nonamyloid; epicutis somewhat fragmentary and very thin, consisting of ascendant to erect hyphal outgrowths which are hyaline, clavate to filamentous or ampullaceous, small, often with secondary excrescencie or forked; hypodermium intermixed, consisting of repent hyphae of very variable diameter with a strong fuliginous pigment incrustation, many of these locally swollen to form short inflated cells, more or less interwoven; underneath the hypodermium, the tramal hyphae subhyaline and nonamyloid; hairs of the stipe extremely versiform as the elements of the epicutis of the pileus, even sometimes vesiculose or subulate and at times with clamp-less septa bicellular, 27—66 ⇌ ± 7.3 µ; hyphae otherwise with clamp connections. The carpophores are very small with relatively long stipes, the latter insititious on sticks, whitish at base, middle now umber gray, apex whitish.

This is the type from Trinidad (K) which I consider as a species of *Marasmiellus*, **M. subingratus** (Dennis) Sing. comb. nov.

Agaricus synodicus Kunze in Fries;
Marasmius nivosus Berk.;
Marasmius epileucus Berk.;
Marasmius subsynodicus Murr.

All four are identical in my opinion. Dennis studied the type of the first of the four species, and comparing his notes with notes taken at K on the two Berkeley species (Spruce types from „Panuré" and Mt. Cocui, Brazil) by the author, one may certainly agree that this is a not uncommon species of the neotropics, distributed from Florida to Brazil, and characteristic because of the white-bleaching small pileus, the distant decurrent lamellae, the completely white (dried) insititious stipe, and the rather small spores. The Florida material (Murrill as *M. subsynodicus* and Singer F 802, F) seems to be identical in all important characters, and so is material received from the Panama Canal Zone. This material is redescribed below:

Pileus pale isabella color to cinnamon, bleaching white or whitish when drying or dried, finely pulverulent-subtomentose when seen under binocular, with smooth to somewhat radiately grooved entire margin, hemispherical-convex, then expanding to convex and flat, more often obtuse than umbonate, 2—12 mm. broad. — Lamellae white, tending to become cream color or subconcolorous when dry or

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dried, intermixed with lamellulae or forked ones, subdistant to mostly distant, narrow to moderately broad, adnato-decurrent, adnate with a decurrent tooth, or plainly decurrent, sometimes separating incompletely from the apex of the stipe and then seemingle subcollariate in age. — Stipe concolorous with pileus but always completely white including the base in dry or dried condition, finely pubescent above and almost pilose below when seen under a binocular, glabrescent above and pubescent below when old, equal or tapering downward, smooth, insititious, 4—5 ⇌ ½—1½ mm. Context very thin, somewhat tough and dry, inodorous.

Spores 5—8.2 ⇌ 2.5—3.5 μ, subcylindrical to tear shaped, hyaline, smooth, nonamyloid; basidia 19.5 ⇌ 5.5—6.5 μ, 4-spored; cystidia none; cheilocystidia filamentous and mostly wavy, many somewhat nodose or with bifurcate apex, others entire, covering a wide zone from the edge inward, more rarely scarce at the very edge; hyphae of the trama underneath the disc often thick-walled, all non-amyloid and with clamp connections; epicutis of pileus of interlaced to somewhat interwoven hyphal elements of somewhat irregular shape, but only with scattered nodules, forks, or semiglobose diverticules not showing a strongly developed *Rameales*-structure except in some places in old specimens; there is some melleous incrusting pigment in some sections; surface layer of stipe consisting of mostly filamentous elements, not more diverticulate than those of the epicutis of the pileus. On living (green) and dead leaf petioles (dicots) and more often on dead sticks of vines and dicotyledoneous herbs in tropical forest. I have seen material from Florida (type of *M. subsynodicus* Murr., also my F 802 from Matheson Hammock, Dade Co., Flo.), and G. W. Martin & A. L. Welden, from the Panamá Canal Zone, both (F), an Theissen's material of *Marasmius petalinus* Berk. & Curt. sensu Theissen, from São Leopoldo, Rio Grande do Sul, Brazil, Rick Fungi Austroamericani no. 208, FH. This, however, is not identical with the type of *Marasmius petalinus* Berk. & Curt. (FH) from the Bonin Islands.

The Brazilian material has slightly better developed *Rameales*-structure on pileus and stipe than both the types enumerated above and the Florida material, but I think it is still identical and, as the other collections, most closely related to *Marasmiellus dealbatus* (Berk. & Curt.) Sing., see below. It should be known as **Marasmiellus synodicus** (Kunze in Fries) Sing. comb. nov.

Marasmius petalinus Berk. & Curt.

See under the species treated in the preceding paragraphs.

Marasmius dealbatus Berk. & Curt.;

Marasmius subgraminis Murr., Bull. Torr. Bot. Cl. **67**: 151, fig. 1, 1940.

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The type of the former (FH) as well as of the latter (FLAS) has spores 5.3—7.5 ⇌ 2.7—3.7 μ and a poorly developed *Rameales*-structure on both pileus and stipe, the latter more often completely white than with brownish gilvous to pale gilvous base, always growing on Gramineae, with the spores as well as the hyphae nonamyloid and numerous clamp connections. This is a characteristic species which is most closely related to *Marasmiellus synodicus* (see above) but can be distinguished easily by the habitat. The new combination **Marasmiellus dealbatus** (Berk. & Curt.) Sing. is here proposed.

Additional material from Florida (F 143, F 140, F, FH) and from Barro Colorado Island, Panamá Canal Zone, G. W. Martin & Welden no. 7092 (IA, det. Singer) has also been studied. A detailed description appears unnecessary since the species has been well described by Dennis (Trans. Brit. Myc. Soc. **34**: 445. 1951) from Trinidad.

Marasmius epochnous Berk. & Br.

Spores 7.5—9 ⇌ 3.3—3.8 μ, hyaline, smooth, nonamyloid; epicutis with *Rameales*-structure; trama nonamyloid, with numerous clamp connections.

This it the type (K), growing on dicot branchlets. It is obviously a *Marasmiellus* with white pileus and eccentric stipe, almost lateral in most cases. I have studied material from Florida and from the Panamá Canal Zone which evidently belongs here. A revised description follows:

Pileus white, slightly pruinose-tomentosulous, orbicular or suborbicular, convex, smooth or almost smooth, 3—5 mm. broad. — Lamellae white, distant, more rarely subdistant, free, adnexed, or adnate, intermixed with lamellulae, often interveined, but also often with smooth intersticia, if interveined only with a few very low anastomoses; spore print pure white. — Stipe white to brownish white, tomentose to furfuraceous-fibrillose, always present but usually short and curved, 0.5—2 ⇌ 0.1—0.2 mm., often arising from a patch of white radiating hyphal fibrils appressed to the substratum, very eccentric to lateral. Context very thin, white, inodorous.

Spores 5.8—9 ⇌ 3.2—4 μ, mostly 6.7—7.3 ⇌ 3.3—3.7 μ, smooth, nonamyloid, hyaline; basidia 4-spored; cystidia none; cheilocystidia cauliflower-like, nodosus-branching with short excrescencies, especially at the apex which is often somewhat swollen, hyaline, making the edge heteromorphous; epicutis of pileus a thin layer with *Rameales*-structure, consisting of diverticulate elements, well developed although slightly less strongly and deeply developed than in *M. inodermus;* same structure on the surface of the stipe; all hyphae nonamyloid with clamp connections.

On dead branches, very gregarious, Florida (Thaxter, Dade Co., F); Panamá Canal Zone (Martin & Welden 7363, Barro

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Colorado Isl. F); Brazil (Schiffner no. 22, State of São Paulo, FH, as *Marasmius schiffneri*); Ceylon (type, K).

Marasmius schiffneri Bres. in Hoehnel, Denkschr. Akad. Wiss. Wien **83**: 15 (reprint pagination). 1907, is described as having spores 9—11 ⇌ 6—8 μ. I am therefore not fully certain that the material from the Patouillard Herbarium (FH) is part of the type, or if so, identical with the holotype studied by Bresadola. If Bresadola's spore measurements were erroneous, *M. schiffneri* would become another synonym of *M. epochnous*. The latter must be transferred to *Marasmiellus* as **Marasmiellus epochnous** (B. & Br.) Sing. comb. nov. It is closely related to *Marasmiellus concolor* and *M. gilvus*.

Marasmius concolor Berk. & Curt.

Spores 5.5—6.5 ⇌ 2.5 μ, oblong, smooth, hyaline, nonamyloid; epicutis consisting of strongly diverticulate elements forming a typical *Rameales*-structure; hyphae of the trama nonamyloid. This is a typically astipitate species; the color of the pileus may have been white, the color of the lamellae most probably was. On dicotyledonous branch.

This is the type, Wright no. 74 (FH). It is undoubtedly a *Marasmiellus*, related to *M. epochnous*, but without stipe, and possibly differing in color. The combination **Marasmiellus concolor** (B. & C.) Sing. comb. nov. is proposed.

Singer & Digilio described a species, called "*Marasmius concolor* Berk.(?)" (Lilloa **25**: 190. 1951) from Misiones, Argentina. This species agrees well with Berkeley's description, but the type analysis, as given above, proves that our doubts regarding its identity were justified. The Argentine species is a true *Marasmius*, and the new name **Marasmius neosessilis** Sing. nom. nov. is proposed for that species: Pileo carneo, sessili; lamellis albis, distantibus; stipite nullo; sporis 9.5—10 ⇌ 4—4.8 μ, cystidiis nullis; epicute subcellulari ea elementis granulosis vel diverticulatis formata; hyphis amyloideis, fibulatis. Ad ramos. Cataratas del Iguazú, Misiones, Argentina, Singer & Digilio M 57, LIL.

Micromphale S. F. Gray.

Collybia pilosa Dennis.

Spores 9.7—11.7 ⇌ 5.8 μ, with finely granular contents, hyaline, nonamyloid, smooth; epicutis of the pileus consisting of depressed or ascendant fascicles of subcylindrical to long-clavate hyphal ends with rounded apex; hypodermium — a cutis consisting of repent elongate hyphae with brown intracellular pigment (not incrusted); beneath are the hyaline hyphae of the trama which are non-gelatinized, nonamyloid (or perhaps very slightly amyloid?); hymenophoral trama regular; all hyphae with clamp connections; cystidia in hymenium none. The fruiting bodies have somewhat the habit

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of *Micromphale foetidum,* but are not gelatinous, with the interstitia of the lamellae distinctly interveined, and the base of stipe distinctly insititious.

This species (type, K, Dennis 315 A from Trinidad) is somewhat difficult to place. It seems somewhat ambiguous between *Marasmiellus* and *Micromphale,* and may be related to *M. perforans.*

Agaricus euomphalus Berk., Hooker's J. Bot. **8**: 131. 1856.

Spores none found; cystidia none; cuticle of the pileus formed by filamentous repent hyphae with some olive-umber resinaceous pigment incrustations (scattered), with some rare and occasinonal diverticulations and some slight roughness noticeable in the walls, but no *Rameales*-structure present; hyphae of the trama hyaline, some thin-, most thick-walled, slightly gelatinized, centripetally and radially arranged, subirregular-subparallel in the pileus, in the lower portion of the gill trama more axillarly arranged and subparallel, hyaline and more thin-walled, also slightly gelatinized, with clamp connections, nonamyloid. The carpophores have somewhat the habit of a *Gerronema elasticum* but the stipe is distinctly insititious, and the hyphae are subgelatinous; in addition, there is incrusting pigment in the pileus cuticle. The pileus is said to be cinereous-white, the lamellae whitish (collector's note on fresh material).

With the data at hand, the type material (Spruce 122, 133, both identical with each other, from Brazil, K) seems to belong to a representative of the genus *Micromphale,* and the combination **Micromphale euomphalum** (Berk.) Sing. comb. nov. is proposed herewith. Whether or not Dennis's material from Trinidad (with slightly yellowish lamellae and more deeply colored pileus), slightly more subdistant (than medium close) lamellae, and spores 6.5 ⇌ 4 μ (smooth, nonamyloid) is identical cannot be stated with absolute certainty. I have studied Dennis no. 80 from St. Joseph, on the ground under bamboo (K), and it seems to agree in all essential characters visible on the dried material although some other specimens under the same name with more distinctly radially fibrillose pileus may not be the same species. *M. euomphalum* is probably closely related to *M. foetidum.*

Marasmius stenophyllus Mont., Ann. Sc. Nat., Bot. ser. 4, **1**: 116. 1854.

Spores 4.8—6 ⇌ 1.7—2.2 μ, hyaline, nonamyloid ellipsoid-oblong or subcylindrical and sometimes curved; basidioles fusoid; cystidia and cheilocystidia none; trama at least partly somewhat gelatinized; cuticle formed by denser hyphae, a cutis, without divericulate elements, hyaline; hymenophoral trama regular, its hyphae somewhat winding; clamp connections present; no amyloid elements.

This is the portion of the type preserved at FH, and evidently in better condition than the PC collection. It consists of two collections

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Leprieur no. 1027 and Leprieur 1029, one much whiter than the other, but identical with each other and obviously also with the Paris type no. 1902 cited by Dennis. This is at least a para-type. According to its characters it should be listed as **Micromphale stenophyllum** (Mont.) Sing. comb. nov.

Marasmius Fr.

The genus will be treated in a separate paper.

Hydropus (Kühner) Sing.

Collybia erinensis Dennis.

Spores strongly amyloid, 6.7—9 ⇌ 5—5.5 μ, smooth, hyaline; epicutis consisting of fragmentary islands or individually scattered but numerous ampullaceous erect dermatocystidia which are hyaline; hypodermium consisting of repent hyphae, brown, forming a cutis; tramal hyphae rather large, nonamyloid, hyaline.

This is the type from Trinidad (K), obviously a **Hydropus, H. erinensis** (Dennis) Sing. comb. nov.

Collybia cavipes Pat. & Gaill., Bull. Soc. Myc. Fr. **4**: 14. 1888, sensu Dennis (1951).

Spores 5.3—6.7 ⇌ 4.5 μ, smooth, strongly amyloid, hyaline; cystidia ampullaceous, on sides of lamellae not rare, some obtuse, few acute, about 72 ⇌16 μ; dermatocystidia on pileus undoubtedly present, but now mostly collapsed; trama of the lamellae consisting of voluminous hyphae, subregular; all hyphae nonamyloid.

This is close to *Hydropus,* and *Porpoloma*, a transfer is not proposed at present since the Patouillard type has not been analyzed.

Mycena (Pers. ex Fr.) S. F. Gray.

Corrugaria alba Dennis, Kew Bull. for 1952: 497. 1952.

Spores 7.5 ⇌ 5.2 μ, amyloid, smooth, hyaline; hymenophoral trama regular; hyphae of pileus weakly and slowly but undoubtedly amyloid; hyphae of gill trama very broad; clamp connections present.

The type from Venezuela (K) seems to be close to *Corrugaria viridiflava* Métrod, Prodr. Fl. myc. Madagasc. **3**: 127. 1949. It would therefore appear that *Corrugaria* Métrod, l. c. is most probably a synonym of *Mycena.* Certainly, *C. alba* Dennis, does not deserve to be separated from *Mycena,* and should be known as **Mycena dennisii** Sing. nom. nov. since the binomial *Mycena alba* is already preoccupied by a different species (*Hemimycena alba* (Bres.) Sing. = *Mycena* alba (Bres.) Kühner = *Omphalia alba* Bres.).

Corrugaria radiata Dennis, l. c.

Spores (6.5) 9 (10) ⇌ (3.3) 3.5 (3.7) μ, cylindrical, hyaline, strongly amyloid, smooth; cystidia none; epicutis formed of hyphal pegs and individual hairs which are very long and now appressed, filamentous, but at the very base somewhat swollen (to 8.2 μ), thin-

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walled, nonamyloid; hyphae of the trama mostly thin, hyaline, long-filamentous, not clamped of the septa, very slightly amyloid.

This may be classed temporarily as a *Mycena,* but it seems to be congeneric with *Mycena lenta* R. Maire which is the type of a tentatively proposed genus, *Leucoinocybe* Sing. ad int. Since both *Corrugaria radiata* Dennis and *Mycena lenta* R. Maire are not as fully known in all aspects as would seem desirable for the publiction of a valid new genus, I refrain, at this moment, from any validation of *Leucoinocybe,* or from any transfer of the species concerned.

Laschia viridula Berk. & Cooke.;
Poromycena viridula (Berk. ex Cooke) Sing.

In view of the observations mentioned by the author in Mycologia **45**: 886, note 6, 1953, the species is herewith transferred to *Mycena* as **Mycena viridula** (Berk. ex Cooke) Sing. comb. nov.

Collybia violaceella Speg., Biol. Acad. Nac. Cienc. Córdoba **11**: 393. 1889.

For the same reasons (see above), this species is transferred to Mycena as **Mycena violaceella** (Speg.) Sing. comb. nov. — Equally, the amyloid-spored species of the "genus" *Dictyoploca* must be considered as belonging in *Mycena.* They are not different from, and should be treated with *Mycena.* It may be added that, since the lecto-holo-type of *Marasmius plectophyllus* Mont. has nonamyloid hyphae, the species determined by some authors as *Marasmius plectophyllus* with either amyloid trama or spores should be renamed and separated from *Collybia plectophylla.*

Baeospora Sing.

Collybia pleurotoides Dennis.

Spores about 4.5 ⇌ 3.7 μ, smooth, distinctly amyloid, hyaline; cystidia none seen; crystalloid bodies, somewhat larger than spores floating all over the preparation; dermatocystidia e. gr. 24.8 ⇌ 7.3 μ but rather variable, cylindrical with often geniculate base, mostly erect on a cutis of hypodermial, colored, repent hyphae, the latter, where exposed, showing isolated cylindrical diverticules (rare) which may be considered as transitions toward dermatocystidia, hyphal diameter e. gr. 13 μ, walls nonamyloid.

This is the type, Dennis no. 247 (K), consisting of two carpophores on what night be a herbaceous stick. The species belongs apparently in *Baeospora.*

Heimiomyces Sing.

Agaricus hilarianus Mont.;
Agaricus melinosarcus Kalchbr.;
Agaricus rheicolor Berk.;
Agaricus cayennensis Mont.

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The four types (*Agaricus hilarianus* — PC; *A. melinosarcus* and *rheicolor* — K; *A. cayennensis* — FH) are identical with *Heimiomyces tenuipes* (Schwein.) Sing. Compare also Type Studies on Basidomycetes II, Mycologia **35**: 158. 1943 (on authentic material of *Marasmius rhabarbarinus* Berk.*) and *Marasmius amabilipes* Peck) and id. IV, Lilloa **23**: 201. 1950 (1952) (on *Agaricus aurantiellus* Speg.).

Crinipellis Pat.

Crinipellis rubida Pat. & Heim.

The type from Venezuela (PC) is macroscopically correctly described as far as can be judged from the dried material. The spores are, however, not as described; they are very rare in the hymenium, and those indicated by Heim must have been immature. Mature spores are very numerous among the hairs of the pileus and stipe; they are exactly like those of *Crinipellis mirabilis* Sing., viz. sclerotizing in the main portion where they become thick-walled and opaque while a small cell at the apex and at the base, or only at one of the ends, becomes separated by a septum, and the small distal cell remains thin-walled, collapsing in the end, and leaving a cylindrical to subangular non-transparent spore in the overmature stage. Neither the immature nor the mature or overmature spores are pseudoamyloid; Basidia 4-spored, clavate; basidioles fusoid, or fusoid-apiculate from a central apical sterigmatoid thin mucro. Hyphae non-amyloid; cystidia none. Heirs of the marginal zone of the pileus hyaline to light wine red in NH_4OH, 6.5—7 μ broad, with thick (2.7 μ) wall, smooth, slightly tapering to the obtusely rounded tip, strongly pseudoamyloid, not septate, running in strands of long parallel hairs, strands radially arranged.

The dried pileus reacts with KOH to make the surface deep green, then grayish green, but NH_4OH merely deepens the wine red color of the dried cap.

C. rubidus sensu Dennis is obviously a different species.

The characters of the spores and the chemical characters show that the type is apparently closer to *C. mirabilis* than to the other representatives of the subsection *Iopodinae* Sing. However, a similar chemical color reaction is taking place in *C. eggersii* Pat., and it is quite possible that the subsection *Grisentinae* should be reunited with subsection *Iopodinae*, since the chemical differences between both sections are reduced to the difference in the NH_4OH reaction, and the septate spores do not seem to be a monopoly of subsection *Grisen-*

*) The authentic material of this species in the Curtis herbarium as well as that in the Paris herbarium are clearly this species; no claim of an analysis of the type from Brazil had been made. The latter is obviously a good *Marasmius*.

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tinae, exactly as they are not found in all species of the section *Globulares* of *Marasmius*. It would be interesting to find out whether *M. mirabilis* has more vividly colored pigmentation in fresh material.

Agaricus urbicus Mont., Ann. Sc. Nat. Bot. ser. 4, **1**: 94. 1854.

Spores not found; epicuticular hairs distinctly pseudoamyloid, thick-walled, non-septate, with rounded apex; cheilocystidia present but not clearly seen; hyphae of trama hyaline, nonamyloid, with clamp connections.

This is undoubtedly a *Crinipellis*. The transfer to *Crinipellis* has already been made by Dennis who indicates the spores as 10—11 ⇌ 4—5 µ "with a larger granular body in the center". My material came from the type, Leprieur 989, (PC). A correct determination of this species cannot be undertaken without more data on spores and cheilocystidia. The habitat suggests *C. subtomentosa* (Peck) Sing. which Dennis thinks "very probobly the same". However, if the spore measurements cited above are correct, the spores wolud be too narrow for that species. It might be possible to gather topotypical material from "sandy soil in Cayenne" (the specific epithet was given because of its occurence in the city of Cayenne, French Guyana).

Marasmius pseudoarachnoides Dennis.

This is a very remarkable species. Spores 18—19 ⇌ 4 µ, sec. Dennis (from spore print), almost clavate, hyaline. The surface of the pileus is formed by the rounded hyphal ends which have very much the structure and shape of the hypotrichial hyphae of *Crinipellis* (actually a special type of a hypodermium), some branching, somewhat irregular. Instead of the *Crinipellis*-hairs, these hyphal ends bear a small (diam. about 3 µ) pseudoamyloid disc inserted on nonamyloid wall material; from this disc, a number (3—10) of flagella-like appendages emerge which are likewise strongly pseudoamyloid, flexible and tapering into a needle sharp tip, 0.3 µ thick at the base and 1.7—4.8 µ long; seen from above, this structure looks as if superimposed upon a cellular structure (optical section of the hyphal ends of the hypotrichium); hyphae of the trama nonamyloid, with clamp connections. The pileus has a central short stipe which at its base connects with white rhizomorphs. The surface of rhizomorphs and stipes has the same structure as indicated above. The lamellae are very distant.

This it the type from Trinidad, coll. Dennis (K). Since there are other species of *Crinipellis* with white rhizomorphs *), it must be assumed that — all other characters agreeing — the species is a

*) **Crinipellis sarmentosus** (Berk.) Sing. comb. nov. (*Marasmius sarmentosus* Berk. from Jamaica); **Crinipellis actinophorus** (Berk. & Br.) Sing. comb. nov. (*Marasmius actinophorus* Berk. & Br., from Ceylon) and probably also *Marasmius tomentellus* Berk. & C. and *M. rigidichorda* Petch.

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Crinipellis in which the "flagellae" are homologous with *Crinipellis*-hairs. This species deserves to be separated in a new section which I propose to call *Pseudoarachnoidei,* characterized by the flagella-like structures described above *).

Chaetocalathus Sing.

Agaricus columellifer Berk., Hooker's J. Bot. & Kew Misc. **4**: 161. 1952.

Spores 7.5 ⇌ 5.5 μ, ellipsoid, hyaline, few; hairs of pileus strongly pseudoamyloid, hyaline in NH_4OH, 3—4 μ thick, curly in places, once one seen with a side branch, inner wall strongly pseudoamyloid and outcropping, where hairs are broken, as a red-brown cap. Carpophores white, with a strong columelliform stipe which is not attached to the substratum; hairs at edges of lamellae ("cheilocystidia") forked or branched, pseudoamyloid, occupying a broad sterile band.

This is the type which was also studied by Pilát who transferred it to *Marasmius* (Transactions Brit. Myc. Soc. **33**: 219. 1950). It was collected in Borneo (K), but was luckily re-collected by Martin & Welden so that we are in a position to give a complete description under the correct name: **Chaetocalathus columellifer** (Berk.) Sing. comb. nov.

Pileus white to yellowish white, strongly radially pilose-woolly with somewhat crenulate-fimbriate margin, dry, often with projecting margin, attached with some part of the surface of the pileus and cup-shaped, 1—8 mm. broad. — Lamellae in dried material buffish white to umber, radiating from the reduced stipe, with 1—2 lamellulae intermixed between each pair of through-lamellae, medium broad, subdistant to distant, adnexed to adnate to the stipe; spore print pure white. — Stipe rudimentary and functionless (with base not attached to substratum), columelliform or conical, conspicuous, white, tomentose; a pseudostipe is sometimes present (extracted portion of the pileus where attached to the substratum), but short and inconspicuous. — Context very thin, practically absent.

Spores (7.5) 8—10.2 (10.5) ⇌ 5—6.8 (7.2) μ (from print), thin-walled, after discharge, when caught in the hairs becoming thick-walled and quite frequently also septate, all pseudoamyloid when mature, hyaline in NH_4OH, ellipsoid, smooth; basidia 4-spored; hairs ("cheilocystidia") forming a broad belt along the edge of the lamellae occupying up to one third of their bredth, spinose and simple, or (most of them) spinose-forked, doubly forked or repeatedly forked, very acute, about 35 μ long or longer, hyaline, strongly pseudoamyloid.

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*) *Crinipellis* sect. **Pseudoarachnoidei** Sing. sect. nov. Hyphis terminalibus hypotrichii disco flagellisque pseudoamyloideis obsitis. Typus: **Crinipellis pseudoarachnoides** (Dennis) Sing. c. n. (*Marasmius pseudoarachnoides* Dennis).

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showing divisions in the lower, middle, or upper portion into (0) 2 to 5, rarely more, spinules and sometimes rather broad underneath the branchings (up to 7.5 μ), otherwise broadest below (3.5—5.5 μ), above around 2—4 μ broad and sometimes the base deep-rooting in the trama (and then to 100 μ and more long) with thick (1.5—1.7 μ) walls; the same hairs sometimes appearing scattered on the sides of the lamellae beyond the marginal zone as "pleurocystidia"; hairs of the pileus usually all simple, dense, hyaline, sometimes slightly incrusted, strongly pseudoamyloid, with mostly acute ends, 3—4 μ thick, some curly, sometimes some with side-branches; hymenophoral trama with some inflated hyphae intermixed in the generally filamentous tissue, hyaline, nonamyloid.

On bark and palm leaves, gregarious, fruiting from June to August (in the western hemisphere), known from Borneo (type) and Panamá Canal Zone, Martin & Welden no. 7279, no. 8562, no. 8580, no. 8682, from Barro Colorado Island (F, and IA).

This species is related to *Chaetocalathus bicolor*.

Trogia hispida Mass., Kew Bull. f. 1901: 162. 1901.

The type from Aburi, Gold Coast, (K) was studied first by Dr. Dennis who discovered the strange structure of the carpophores. The woolly covering consists of pseudoamyloid thin hairs rising from a hypotrichium separating it from the trama proper; the latter pervaded by numerous ochraceous setose hyphae running vertically from the hypotrichium to the hymenophore and many entering the hymenium as cystidia which are often forked at the apex; hymenophoral hyphae regular, interwoven, flanked by a broad irregular subhymenium, cheilocystidia very dense, stramineous-ochraceous forked with acute tips, occupying a broad zone, very interwoven, these as well as setose hyphae and ycstidia pseudoamyloid, the cheilocystidia most strongly so; hyphae hyaline, with clamp connections, nonamyloid. Pileus white more brownish at margin where woolly layer is thinner, brown at level of hypodermium, pale brown in trama and lamellae which are crowded, adnexed to a white horizontal tomentose lateral stipe, but pileus also directly attached to a basal brownish socle (like true Trogias), lateral, now 3.5 mm. broad. Spores not pseudoamyloid, about 6.5 ⇌ 5.2—5.5 μ.

This belongs in the same stirps as *Chaetocalathus africanus* (Pat.) Sing. The tramal structure is analogous to Corner's "dimitic *Pterula*-series".

Amanitaceae.

Amanita Pers. ex S. F. Gray.

Agaricus monticulosus Berk. & Curt.

The original description was apparently made up from various collections. The Kew type shows nonamyloid spores and the re-

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spective carpophores seem to belong in the *muscaria-cothurnata*-group rather than in the synonymy of *Amanita cookeriana*. My interpretation (1951) is therefore not tenable although it coincides more or less with the earlier type studies by Atkinson and the original description which, however, is rather vague as far as the color and marginal striation is concerned.

Metraria Cooke & Mass.

Metraria insignis Cooke & Mass., in Sacc. **9**: 82. 1891.

Spores from print 8—10.3 ⇌ 5.8—7 μ, ovoid, nonamyloid, not metachromatic in cresyl blue mounts, with a thin endosporial wall layer, the episporium smooth in outline but very conspicuously heterogeneous, consisting of ochraceous brown spinules inserted in pale pink wall substance as in many species of *Crepidotus* and *Porphyellus*, consequently the spores appearing punctate; without germ pore and without suprahilar depression; spore print now between "ferrugineous" and "hazel" (R.), and apparently so when fresh since the dusting as painted in the original painting (Martin 561) is of the same color. Carpophores not preserved, but a good drawing showing carpophores of *Amanita*- habit, white with pink lamellae, white annulus and a well developed membranous white volva (as in *Volvariella*), growing on the ground.

The painting with the spore print represent the type, from Melbourne, Victoria, Australia (K). This was long thought to have been lost, but the spore print provides a possibility to analyze this very interesting fungus, at least partially. Since no data on the structure of the epicutis and the hyphae especially those of the hymenophoral trama can be obtained, the position of the genus in the system of *Agaricales* remains uncertain, but the species is well enough defined by its macroscopical and spore characters to be certain that it is a representative of an independent genus with unique character combinations. If it belongs in the Amanitaceae, it differs from all other genera in the punctate spores. There is, however, a possibility that, in reality, this is a agaricaceous form (or a form belonging to the *Strobylomycetaceae* but even then there could not possibly be any doubt as to its independence from other known genera.

Pluteus Fr.

The type studies referring to this genus will be incorporated in a special paper on *Pluteus*, now in preparation.

Agaricaceae.

Agaricus lignifragus Mont.

The genus *Leptomyces* Mont. is based on this species. *Leptomyces* has been considered a synonym of *Hiatula, Mycena*, etc. but without a type analysis, it is impossible to understand the position of the genus *Leptomyces*. The Paris herbarium does not contain the type of

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A. lignifragus; the species is absent at Kew, and in the Farlow Herbarium. Under these circumstances, it must be considered as a nomen dubium, and with it, the genus based on it. From the description one might guess that Montagne had something like the Corrugarias of Métrod and Dennis (see above under *Mycena*).

Chlorophyllum Mass.

Agaricus glazioui Berk., Vidensk. Medd. f. 1879—80: 32. 1880.

The type from Rio de Janeiro (K) has all the characters of *Chlorophyllum molybdites* a was correctly pointed out by Dennis (Kew Bull. f. 1952: 462. 1952). The spores are of the same size as those of *C. molybdites* *).

Ripartitella Sing.

Collybia pseudoboryana Dennis.

The type from South America coincides precisely with *Ripartitella brasiliensis* (Speg.) Sing.

Bolbitiaceae.

Conocybe Fay.

Agaricus umbellula Mont.

Spores 15—17 ⇌ 8—9 μ, bright and deep rusty in NH_4OH, smooth, with distinct germ pore; cheilocystidia ventricose below, with abrupt capitulum (3.5—5 μ); basidia 4-spored; dermatocystidia in the middle of the stipe vesiculose to ampullaceous, non-capitate, intermixed with elongate hyphous hairs arising from a thickened base; NH_4OH not forming needle-like crystals in hymenium preparations. The carpophores are large (size of *C. pubescens* and *cryptocystis*), 10—30 mm. in diameter, stipe 50—80 ⇌ 1—2 mm. (Montagne); the stipe is said to be yellowish, but is now brownish with precipitations of brown pigment on the hyphae; the pileus seems slightly reticulate.

This is the type from French Guyana, Leprieur 978 (PC.). According to the data obtained, there is hardly any appreciable difference between this species and *C. pubescens* (Gill.) Kühner. We have not been able to demonstrate capitate dermatocystidia on the stipe, but they are so scarce to practically absent in some fresh collections that I cannot give much weight to this fact. The habitat (inter folia) may have been rich in dung. The new combination **C. umbellula** (Mont.) Sing. is herewith proposed, and *C. pubescens* appears to be its synonym.

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*) On the other hand, there is a smaller spored species (9,7—10,3 ⇌ 7,3 μ) which may explain the fact that green-spored „Lepiotas" are at times indicated as edible while *C. molybdites* is poisonous. More detailed studies are necessary in order to establish a correlation between the presence of the poisonous matter and the spore size, but it may well be that the type species of *Chlorophyllum* is slightly different from *C. molybdites* (on the specific or varietal level).

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Agaricus siennophylla Berk. & Br.

Spores 7—9.5 (10.3—11.7) ⇌ 4.5—5.3 (5.8—6.8) μ, smooth, deep rust color, with distinct and broad germ pore; a minority reaching 10.3 ⇌ 5.8 μ (apparently from bisporous basidia, very few reach 11.7 ⇌ 6.8 μ); basidia 4-spored, a minority 2-spored; cheilocystidia ventricose abruptly capitate apex, the capitulum 3.5—4.7 μ in diameter; dermatocystidia of the stipe all non-capitate, varying from vesiculose to ampullaceous, and intermixed with some „hairs", i. e. with the neck elongated into a hyphous appendage (so in middle of stipe); hyphae of the middle of the stipe with stramineous membrana pigment; NH_4OH not producing needle-like crystals in hymenium preparations.

The type (K) is no. 933 from Peradyniya, Ceylon, Jan. 1869, and is in good condition. It is a species of *Conocybe,* section *Pilosellae,* apparently independent since it has smaller spores than *C. siliginea* and *C. subvelata.* The new combination **C. siennophylla** (Berk. & Br.) Sing. comb. nov. is proposed.

Galerula cryptocystis, Atk.

The type has all characters of *Conocybe megalospora* (J. Schaeffer) Sing., the ex-*pubescens* (Gill.) Kühner, and this species must therefore be renamed **Conocybe cryptocystis** (Atk.) Sing. comb. nov.

Agaricus martianus Berk. & Curt.

Spores 7.2—8.3 ⇌ 4.5—5.3 μ, consisting of a rather pallid, thin endosporium, a rusty colored episporium and a deep rusty brown exosporium forming low warts as in *Galerina*-spores, with a small but distinct germ pore, rough in circumference, ellipsoid, without plage; hymenium collapsed.

This is the type from Cuba (K), Wright coll. It belongs in the subgenus *Ochromarasmius* Sing. of *Conocybe* and should be known as **Conocybe martiana** (Berk. & Curt.) Sing. comb. nov. It is related to *Conocybe radiata* Sing. but differs in much smaller carpophores and lack of a pseudorhiza.

Pholiotina Fayod.

Agaricus striaepes Cooke.

Spores 9 ⇌ 4.5 μ, with germ pore, well pigmented, smooth, with complex wall; basidia 4-spored; cheilocystidia mostly collapsed, one seen (ampullaceous-subcapitate); stipe with dermato-basidia, small versiform dermatocystidia and occasional hyphous outgrowths from the hyphal surface of the stipe proper; hyphae without clamp connections.

This is the type, collected in Kew Gardens and preserved at the Kew Herbarium. It is obviously the same as *Pholiotina pygmaeo-affinis* (Fr. sensu Kühner) Sing. This confirms the synonymy given in Kühner & Romagnesi, Flore Analyt. p. 345, 1953.

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Agrocybe Fayod.

Agrocybe sacchari (Murr.) Dennis.

Murrill's original specimens were not studied. Those collected by Dennis and determined as above have all the characters of *Agrocybe fimicola* (Speg.) Sing., four-spored race, and are undoubtedly identical with that species, which, in Argentina, frequently occurs in sugar cane fields.

Agrocybe broadwayi (Murr.) Dennis.

Murrill's original specimens were not studied. Those collected by Dennis have all the characters of *Agrocybe neocoprophila* Sing. based on *Hebeloma coprophilum* Rick non *Agrocybe coprophila* Sing. (1950). The epithet proposed by Murrill, if the corresponding type is identical with the Trinidad collections at Kew, has priority over the new name proposed by me.

Agaricus phylicigenus Berk.

Spores 9.8—12.7 ⇌ 5.8—7.3 μ, smooth, thick-walled with complex wall, melleous-ochraceous, with mostly non-truncate but distinct although narrow germ pore; cystidia present on the sides of the lamellae; epicutis of pileus cellular.

This comes from the material collected during the Challenger expedition (K), type, Oct. 17, 1873. The species is identical with *Agrocybe aegerita* (Brig.) Sing.

Strophariaceae.

Naematoloma Karst.

Agaricus micromegas Berk.

This (type, K) is obviously one of the common Naematolomas near *N. fasciculare.*

Agaricus elongatipes Peck.

This (type NYS) is obviously the species described as *Naematoloma elongatum* by Smith in his excellent monograph of the genus. This species should be known as *Naematoloma elongatipes* (Peck) Sing. according the rules of nomenclature. The type of *Galerula paludicola* Atk. (CU) is also this species.

Flammula brunnea Mass.

The type (K) from New Zealand is a *Naematoloma,* near *N. sublateritium.*

Psilocybe Kummer.

Agaricus udus Pers. ex Fr. sensu Karst., M. F. no. 305.

This specimen, the oldest of interpretations of *Agaricus udus,* as preserved at Kew, shows spores 12.5—19 ⇌ 8 μ, olive brown, with broad germ pore; cheilocystidia ampullaceous or more often ampullaceous-subcapitate, about 43 ⇌ 5.2 μ; basidia 4-spored, few 2-spored; chrysocystidia present, rather numerous, distinct.

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This was collected in *Sphagnum,* in Finnland by K a r s t e n, and should therefore be considered as lecto-type of the species. K a r s t e n had exchange relations with F r i e s, and, moreover, worked in a region with similar conditions of climate and forest flora as did F r i e s. Furthermore, I do not know of any older material usable as a means of interpretation of the species. The *Naematoloma,* described by A. H. S m i t h as *Naematoloma udum* (Pers. ex Fr.) A. H. S m i t h should therefore be considered as representative of F r i e s's species in preference to the species described by S i n g e r as *Psilocybe uda* (Pers. ex Fr.) Gillet (Lilloa **26**: 143. 1953), and the latter must be renamend. For the *uda*-like *Psilocybe* without chrysocystidia, the new name **Psilocybe paupera** Sing. is proposed.

P s i l o c y b e p a u p e r a Sing. Species *Naematolomati udo* simillima sed absentia chrysocystidiorum notabilis; sporis 13.8—20.5 ⇌ 6.8—9.7 μ; basidiis 1-, 2-, 3-, 4-sporis. Inter *Sphagna.* Typus: S i n g e r no. B 103, LIL, Taimbesinho, Brasiliae.

Deconica (W. G. Smith) Karst.

A g a r i c u s g o n i o s p o r u s Berk. & Br.

Spores 5.8 ⇌ 5.5 μ, olive colored, rhombic in frontal view, with thick complex wall, with broad germ pore, smooth; epicutis a layer of filamentous repent hyphae with clamp connections.

The type, no. 835 (K), from Ceylon, is udoubtedly a *Deconica* for which I propose the combination **Deconica goniospora** (B. & Br.) Sing. comb. nov. Distinct gleocystidia-like cells were not observed. The species was described as *Flammula,* but has evidently nothing to do with *Flammula* (subgenus of *Pholiota*).

Melanotus Pat.

C r e p i d o t u s r i d l e y i Massee.

This has all the generic characters of *Melanotus* and seems to be a distinct species with a new host for the genus: on dead fern rachis. The combination **Melanotus ridleyi** (Mass.) Sing. comb. nov. is propossed. Type studied at Kew.

A g a r i c u s t u r b i d u l u s Berk. ex Cooke.

This has all the generic characters of *Melanotus hepatochrous* (Berk.) Sing., and may be identical with this particular species. Type (K).

Pholiota Kummer.

A g a r i c u s r u f o p u n c t a t u s Berk. & Br.

The type (K) has all generic characters of a *Pholiota.* No specific determination has been attempted.

A g a r i c u s h e l i o c a e s Berk. & Br.

Spores 6.5—8 ⇌ 3.5—5.3 μ, frontally ellipsoid to ovoid, in profile not reniform, smooth, brownish melleous to ochraceous, with slight

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germ pore (a tiny, non-truncate pore); chrysocystidia present, distinct, with yellow inclusion. Aspect of carpophore flammuloid.

This is no. 859, Dec. 1868. The above described portion of the original collections is herewith designated as lectotype. This is a species of *Pholiota*, **P. heliocaes** (Berk. & Br.) Sing.

Agaricus dissimulans Berk. & Br.

Spores 7.2—9.8 ⇌ 5.3 μ, pale brownish, smooth, without distinct germ pore (there is a germ pore but it is very tiny and, because of the thin spore wall, very inconspicuous, not truncate), mostly about 7.5 μ long; basidia 29 ⇌ 7.3 μ, 4-spored; cheilocystidia ventricose, with protracted thin neck and therefore more or less ampullaceous, or with the neck apically subcapitate, hyaline, not incrusted; chrysocystidia none, and generally no cystidia on sides of lamellae; cuticular layer with repent hyphae, all filamentous, forming a cutis, and containing a bright yellow pigment. Appearance of carpophores reminding one of *Agrocybe erebia*, with white basal mycelium.

The type from England (K) is not an *Agrocybe* as one might be inclined to believe when looking at the published illustrations. It is a *Pholiota*.

Agaricus scobifer Berk. & Curt.

The carpophore is strongly squarrose all over. The type from Cuba (K) consists of a single carpophore, growing on wood. This carpophore is immature and does not contain any spores; the structure of the hymenium is obscured by numerous mould spores. This is a nomen dubium.

Pleuroflammula Sing.

Crepidotus austroafricanus Pilát.

The thick-walled, brownish, smooth spores without germ pore measure 9—10.5 ⇌ 6.5—7.3 μ. I was unable to obtain more pertinent characters.

This is the type (K). It is most probably a *Pleuroflammula*. It may be identical with or related to a portion of the material of *Agaricus* (*Crepidotus*) *leptomorphus* preserved at Kew (see under *Crepidotus*).

Incertae sedis:

Pilosace pendolae Speg.

Spores 11.5—15 ⇌ 6.8—9.7 μ, deep chestnut colored, somewhat broader in frontal view than in profile, with broad germ pore, with thick complex wall, smooth; chrysocystidia rather small, numerous, broadly clavate and mostly mucronate, in ammonia showing a yellow internal amorphous body; cuticle of pileus consisting of an epicutis which consists of non-gelatinized filamentous hyphae forming a cutis, and a hypodermium which is also not gelatinized and consists of much broader and less parallel hyphae than the epicutis, but still

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not typically vesiculose or making the impression of a pseudoparenchymatic layer.

The type, herb. no. 17012 LPS, coll. A. Pendola, June 1920, with a colored sketch and descriptive notes mentioning traces of an annulus. This species belongs to the *Strophariaceae, Strophariodeae,* and is either a *Naematoloma* or a *Stropharia,* most probably the latter.

Cortinariaceae.

Alnicola Kühner.

Galerula mirabilis Atk.

Spores 14.3—23 ⇌ 7.5—10 μ, sometimes reaching 25 ⇌ 11.2 μ, almond shaped, strongly punctate-warty and occasionally the warts running into each other and forming very short ridges, the ornamentation much deeper colored than the episporium, with a slight perisporial enveloping mass in some spores, with a strong papilla at the apex which is merely a strongly developed callus, without plage; cystidia none; cheilocystidia clavate-vesiculose-pedicellate, hyaline to pale melleous, 35—80 ⇌ 11—13.5 μ; hymenophoral trama consisting of filamentous hyphae which are hyaline or very finely incrusted by punctations from a pale melleous pigment; basidia 2-spored; epicutis formed by cells which make up an epithelium, cells e. gr. 30 ⇌ 21 μ; all hyphae without clamp connections.

This is the type of the Atkinson Herbarium no. 15117, (CU), coll. Whetzel June 17, 1903 in Swamp McLean, N.Y., and is accompanied by Atkinson's descriptive notes which, combined with the anatomical data given above, make it absolutely clear that this is not a „*Galerula*" in any sense, but a species of *Alnicola,* more precisely *A. bohemica* (Velen.) Kühner which is antedated by Atkinson's species. Consequently, the valid name for it is **Alnicola mirabilis** (Atk.) Sing. comb. nov.

This species was first described from America by Atkinson, later by A. H. Smith as *Naucoria hamadryas* Fr., specimens of which were received by the author and recognized as the same as *Alnicola bohemica.* This species is rather common in Eastern North America, especially in Michigan where the author made several collections (N 744, N 948, F).

Galera inculta Peck.

The type (NYS) has apparently all generic characters of an *Alnicola,* and is, besides, identical with *Alnicola alnetorum* (Maire in Kühner) Romagnesi. The latter has therefore to be renamed: **Alnicola inculta** (Peck) Sing. comb. nov.

Descolea Sing.

Agaricus recedens Cooke & Mass.

Spores 12.3—13 ⇌ 7—7.3 μ, almond- or boat-shaped, with a slight suprahilar depression, with an apical mucro (callus), rusty punctate

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by an exosporial ornamentation on yellow ground (episporium); basidia 31—42 ⇌ 9—10.3 μ, 4-spored; cheilocystidia not recovered; clamp connections present; cuticle of pileus with very broad, subisodiametric cells, broad elongate cells also present, incrusted by a fulvous-ferruginous pigment. The specimens preserved have somewhat the appearance of *Pholiotina blattaria,* the annulus being attached in the middle of the stipe and still very distinct; the lamellae are remarkably spruce yellow, yellow brown, even now.

This is the type from Mordiallac, Victoria, Australia, coll. O. French 1889 (K). The description makes no mention of the tree under or with which it occurs, but since *Nothofagus moorei* occurs in that region in rain forest gullies, I assume that this species grows with *Nothofagus* as does its nearest relative, *Descolea antarctica* Sing. in Tierra del Fuego. *Agaricus recedens* must also be transferred to *Descolea* as **Descolea recedens** (Cooke & Mass.) Sing.

The presence of *Descolea* in Australia is now proved. I have no doubt that it also occurs in New Zealand. The species known are all very closely related. The Australian species would differ from the Fuegian one in the colors described by Cooke & Massee and in being slightly more slender and perhaps with slightly narrower spores. The latter seem to indicate a closer relationship between the Tierra del Fuego *Descolea* than the form occuring further north in Patagonia, a fact that may be of importance when the origin of the disjunction of the geographic area of such genera as *Descolea* is studied. It must be assumed that basidiomycetous genera like this are old enough to have participated in the great Australantarctic flora that once connected both Tierra del Fuego and New Zealand with the antarctic continent, but became separated later on by geological and climatical changes. If this may be assumed to be a valid hypothesis, the further observation regarding the characters of species with area disjunction between South America and Australia becomes rather interesting. In the three best-known cases, we have a Gastromycete close to Agaricales (*Thaxterogaster*), a strongly annulate genus (*Descolea*) and a strongly volvate genus (*Amanita*) of Agaricales. This fits well enough with the author's ideas on the origin of the Agaricales.

Gymnopilus Karst.

Naucoria pellucida Murr. sensu Dennis.

Murrill's type of the species was analysed by A. H. Smith, and found to belong in *Galerina.* The interpretation given in Dennis' paper is different. There are two collections under this name in the herbarium (K), no. 64 A, and no. 64. Dennis tends to assume that no. 64 is a young stage of no. 64 A since both grew at the same locality and are macroscopically very similar. Nevertheless, the spores of no. 64, although they are smooth (as is indeed often the case in

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young spores of ordinarily warty-spored species) are larger than those of no. 64 A, and have a germ pore. In spite of the macroscopical similarity and the similarity of the cheilocystidia, I am inclined to think that they are different. Neither one of the two collections is identical with *Galerina pellucida* (Murr.) Smith & Sing. The specimen which I have studied completely is no. 64 A:

Spores 5.3—5.8 ⇌ 4,5 μ, with isolated exosporial warts, short ellipsoid, without germ pore; basidia 6.5 μ broad, 4-spored, pleurocystidia none; cheilocystidia now seemingly versiform, but apparently mostly ventricose with long ampullaceous neck and capitate apex; epicutis of the pileus not strongly differentiated, and consisting of long and rather broad hyphae with frequent septa, incrusted by an ochraceous pigment, repent with occasional hyphal chains slightly ascending, cells 25—120 ⇌ 14—39 μ; hyphae with clamp connections.

This species should be redescribed as new, in *Gymnopilus,* unless type studies on species not revised by me show it to be conspecific with some species already described.

Gymnopilus flavidellus Murr.

The type of this species correponds well with the species keyed out in my key in Lilloa **22**: 565. 1949 (1951) as *G. amarisssimus* var. *subdryophilus.* Since the differences are rather on the specific level, I accept the earlier name for this plant.

Pileus yellow on margin („Chinese y." or „ta ming" M & P), with deep colored center („Punjab" M & P), sometimes entirely „Punjab", on margin sometimes marbled with „Alamo" (M & P), glabrous and smooth, not viscid, somewhat moist, eventually rarely rivulose-rimulose or cracking deeply, exceptionally partially extremely finely appressedly squamulose, convex, eventually often flat, but often with an obtuse umbo, with incurved margin, 27—60 mm. — Lamellae light yellow, then rust-spotted and eventually always deeply and intensely orange-fulvous-rusty (often between „Mars yellow" and „Sandford's brown R. with more or less „auburn" floccons on edge), crowded, in age in large carpophores sometimes becoming subclose, narrow, in large specimens in age often becoming broad, adnate-subdecurrent, or sinuate; spore print „amber brown" with a shade of „Argus brown" (R.). — Stipe pale yellowish, usually staining fulvous brown, often faintly yellowish pruinate-fibrillose, at least at apex, deep brown at base, at least in age solid, 20—60 ⇌ 3—8(10) mm; veil none; basal mycelium white. — Context pale yellow to yellow; odor slight, taste distinctly and strongly bitter.

Spores 7.5—8.3—11 ⇌ 5—5.3—6.8 μ, finely warty from a exosporial ornamentation, well colored, deep rust in KOH; basidia up to 36⇌ 8 μ, 4-spored; cheilocystidia at and near edge among basidia, ventricose below and subcapitate to capitate above, hyaline or pale brownish, about 36 μ long and 7.2—7.5 μ broad; in lamellae-preparations a

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yellow pigment invades the medium; hymenophoral trama regular; epicutis of pileus consisting of filamentous repent hyphae, emerging cystidioid bodies absent; all hyphae with clamp connections.

Usually gregarious to subcespitose and by me always found on frondose wood, but apparently also sometimes on coniferous wood, fruiting from May until fall. Michigan (Singer N 474, N 888, N 1163 on *Betula* all F) south to Florida (Singer F 2471, F, and Murrill as type of *Gymnopilus subdryophilus,* FH, FLAS).

The larger spores correspond to my Florida material, and coincide in size with those observed on *G. amarissimus* Murr. In Michigan, the spores were mainly up to 8.3 ⇌ 5.3 μ.

Agaricus amazonicus Berk. ex Cooke.

Spores 7—7.2 ⇌ 5.5—6.2 μ, strongly warty from an exosporial ornamentation, without plage, short-ellipsoid, well colored but not so deeply pigmented as in *Pyrrhoglossum*; cheilocystidia not found; hyphae of the pileus epicutis repent, incrusted, filamentous; hyphae with clamp connections. NH_4OH black on surface of pileus. Lamellae not so deep rust as usual in *Gymnopilus,* but where the spores are massed they are bright rusty. This is a rather naucorioid specimen, apparently evelate with ferruginous fuscous pileus and deep brown stipe, growing on earth (since there are earth particles at the base).

This was described as a *Pluteolus,* but the type from „Panuré" (coll. Spruce, K) is undoubtedly a *Gymnopilus* which is evidently identical with the following species.

Agaricus marasmioides Berk.

Spores 6.5—7.5 ⇌ 5.8 μ. Other characters as above.

The type, Spruce 116 from „Panuré" (K), is a *Gymnopilus,* **Gymnopilus marasmioides** (Berk.) Sing. (syn.: *Agaricus amazonicus* Berk. ex Cooke).

Agaricus aureobrunneus Berk. & Curt.

Spores 6.8—8(8.5) ⇌ 4.3—5.3 μ, with relatively low punctiform warts of an exosporial ornamentation, without plage, verrucose to verruculose to (more rarely) almost subsmooth in outline, ellipsoid, with rather deep pigmentation; basidia 23 ⇌ 6.5 μ, 4-spored; cheilocystidia ventricose to subfilamentous but capitate or subcapitate above in many individual cells, more rarely ampullaceous without thickening above, hyaline or yellowish or chestnut incrusted, small, the capitutum about 4—5 μ broad, or smaller; tramal hyphae parallel in the lamellae, with clamp connections. There is no evidence that this grew on monocotyledonous rests, on the contrary, the substratum left seems to be dicotyledonous.

The type (K, FH) from Cuba differs very little from *G. chrysopellus* (Berk. & Curt.) Murr., and was transferred to *Gymnopilus* itself by Murrill which places the species in the correct genus. In *G. chrysopellus,* we have sometimes observed that a minority of

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cheilocystidia has subcapitate apex. The problem cannot be solved definitively at present. The species described as *G. aureobrunneus* by Dennis from Trinidad is a species different from the type of *G. aureobrunneus* if one gives any weight to the host. The spores of the Kew type of *G. aureobrunneus* are 7—8(8.5) ⇌ 5—5.3 μ as compared with those of *G. aureobrunneus* sensu Dennis which measure 6.5—7.3 ⇌ 4.4—5.2 μ, and although they appear to be slightly narrower in an average in the latter, the difference is indeed very slight. I am inclined to believe that, at present, the best solution appears to be to refrain from synonymizing the various species involved until further studies show just how constant the differences observed are, and to name the species on Monocotyledones *Gymnopilus earlei* Murr. which is most certainly the same species as that described by Dennis.

Flammula elegantula Mass, Kew Bull. 1914: 359. 1914.

Spores 6.5—7.3 ⇌ 4.5—5.2 μ, warty; basidia 25.5 ⇌ 7.3 μ, 4-spored; cheilocystidia not observed. This grows on dead *Cocos,* according to the type label. This is apparently an older (more fulvous and washed out) stage of *Gymnopilus earlei* Murr.

Gymnopilus chrysopellus Berk. & Curt.

The Kew type was studied in addition to the Farlow type in order to make sure that the type collection is homogeneous. The spores and cheilocystidia (ampullaceous, non-capitate) are the same in both cases, and the carpophores in both herbaria are evidently the same species corresponding perfectly with the full description given by this author in Lilloa **25**: 369. 1951.

Agaricus chrysotrichus, Berk. & Curt.

The type is most probably identical with either *G. chrysopellus* or *G. aureobrunneus.* It is supposed to be different in having free appressed hairs on the pileus, but a microscopical examination of the surface of the pileus of the type (K) shows that the golden hairs of no. 54 consist entirely of mold conidia. Consequently, with the decisive character of the species proved to be of foreign origin, the species, as described, consists of two different organisms and is, according to the rules, a nomen confusum. The agaric is a form probably identical with *G. chrysopellus* (spores 6—7.8 ⇌ 4,3—5.2 μ and cheilocystidia ampullaceous-non-capitate).

Agaricus crociphyllus Cooke & Mass.

The spores are verruculose-punctate, 5.8—7 ⇌ 4.5—5 μ, sligthly roughened in outline, not very deeply rust colored. The carpophores look sometwhat like very old *G. spectabilis,* but the spores are different. The type (K) cannot be determined with any degree of certainty, although it is undoubtedly a representative of the genus *Gymnopilus.*

Agaricus purpuratus Cooke & Mass.

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Spores 8—9 ⇌ 4.8—5.5 μ, with a rather conspicuous warty exosporial ornamentation, without plage, well pigmented; basidia 21.3 ⇌ 7.3 μ, 4-spored; cheilocystidia ventricose below, with a cylindrical neck and capitate apex, 20—25 ⇌ 3.8—6.5 μ, neck 1—2.8 μ in diameter, capitulum 4.5—5.8 μ in diameter; hyphae with clamp connections.

The type, on fern stems in England (Kew), as preserved at K, is a naucorioid species of *Gymnopilus,* with characteristic macroscopial characters, bitter taste, and should be known as **Gymnopilus purpuratus** (Cooke & Mass.) Sing. It is close to but different from *Gymnopilus luteofolius* (Peck) Sing. (cf. Revue de Myc. **18**: 19. 1953).

Agaricus filiceus Cooke.

Spores 7.3—7.7 ⇌ 4.5 μ, moderately strongly warty from an exosporial ornamentation, without plage, with isolated warts, rather well pigmented; basidia 23 ⇌ 6.5 μ, most hyaline, fewer chestnut incrusted (resinous), 4-spored; cheilocystidia mostly collapsed, seemingly both ampullaceous and capitate ones present; hyphae with clamp connections. Carpophores rather small to medium sized; turning rust (deep and vivid rust color) in KOH and exuding a yellow sap. The original painting by Cooke shows close subdecurrent yellowish lamellae, a distinct trace of an annulus, pale yellow stipe, and rusty brown squamules on yellow ground on the cuticle of the pileus. On stump of *Cyathea dealbata* in a greenhouse in England.

This is the type (K) which is undoubtedly different from other species of the same genus known to me, and should be known as **Gymnopilus filiceus** (Cooke) Sing. comb. nov. It has nothing to do with the red-scaly species, and would key out with *G. chrysopellus* from which it differs in the shape of the exosporial ornamentation, closer lamellae and perhaps the structure of the squamules and the shape of the cheilocystidia. It is kept apart from *G. chrysopellus* mainly because of the habitat, but is as close to it as *G. earlei* (see above).

Agaricus oxylepis Berk. & Br.

Spores 6.2—7.3 ⇌ 5—5.2 μ, distinctly warty, with rather isolated and strong, well colored exosporial warts, without plage; cheilocystidia not studied. The carpophore is slender, small, habit of a small *Lepiota,* with apical, distinct, distant annulus, with strictly erect spiniform squamules.

This is the type (K), no. 907, Peradiniya, Ceylon. It is a good species of *Gymnopilus,* **G. oxylepis** (Berk.) & Br.) Sing. comb nov.

Agaricus trailii Berk. & Cooke.

Spores 5.5—6 ⇌ 4.5 μ, verrucose from isolated exosporial warts, deeply and intensely rusty colored in KOH; cheilocystidia not with certainty establishable, apparentlny vesiculose below with long „neck" which is slightly or not thickened toward apex but not sub-

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capitate or capitate, 32—33 ⇌ 6.5 μ „neck" 3 μ thick; hyphae with clamp connections. The carpophore is almost closed although the hymenium is mature, pileus surface strongly squarrose, dry, stipe woolly-scaly; annulus yellowish, simple, distinct.

The type (Trail, from Teffé, Brazil, K) consists of a single carpophore, but the macroscopical characters in connection with the small spores make it possible to recognize this as an autonomous species of *Gymnopilus,* **G. trailii** (Berk. & Cooke) Sing. This might be an earlier name for *G. zenkeri* (Henn.) Sing. which is somewhat larger, with very slightly larger spores, a condition easy to explain by the fact that the Trail type is still rather young. Good material of what I believe to be the same as *G. zenkeri* was collected by Harley at Ganta, Liberia. The cheilocystidia of the African specimens were 20—28 ⇌ 6.8—7.5 μ, ventricose-ampullaceous with capitate apex; spores 5.8—6.5 ⇌ 4—4.8 μ. Further studies on South American specimens, when available, will show how constant these differences are. At any rate, the two species are closely related.

Agaricus crocias Berk. & Br.

Spores 7.5 ⇌ 4.7 μ, appearing smooth, but very finely punctate from an exosporial ornamentation, without plage, without suprahilar depression, comparatively poorly pigmented because of the weak ornamentation; cheilocystidia ventricose at the base, with a long „neck" which is subcapitate at the apex or equal (ampullaceous-non-capitate type). Aspect of carpophores as in *G. peliolepis* (Speg.) Sing. but the scales dark rusty rather than red (although there is no evidence that they have not been red when fresh, or when the carpophores were fresh).

The type, no. 1126 from the Central Prov., Ceylon (K) is well preserved and should be considered as a good species of *Gymnopilus* in view of the punctate spores. It grew on what appears to be dicot wood. The combination **Gymnopilus crocias** (Berk. & Br.) Sing. comb. nov. is proposed for this species.

Pyrrhoglossum Sing.

Agaricus holocrocinus Berk.

Spores 5.5—6.2 ⇌ 4.2—4.5 μ, with verrucose exosporial ornamentation, warts isolated, plage none; hyphae with clamp connections. Carpophore rather large, with eccentric stipe and very crowded lamellae, on wood.

This is the type, coll. Gardener at Ambegamoa 1846 (K). In view of the eccentric stipe, the relatively small and short strongly ornamented spores and the crowded lamellae I consider this as a species of *Pyrrhoglossum* rather than *Gymnopilus.* The combination **P. holocrocinum** (Berk.) Sing. comb. nov. is proposed.

Crepidotus substipitatus Murr.

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Spores 4—6 ⇌ 3.7—4.3 μ, strongly warty, deep rich ferrugineous fulvous, without plage. Macrospopically like *Pyrrhoglossum pyrrhus*. The type from Cuba (NY) is a synonym of the latter species.

Crepidotus sarawakensis Pilát.

The type (K) from Borneo, collected by Beccari and determined by Cesati (as *Agaricus mollis*) has small ovoid-subglobose spores (4.5 ⇌ 3.7 μ), strongly warty, deep rusty, and belongs in *Pyrrhoglossum*. It is, however, not very similar to the Asiatic species (*P. hepatizon*) but rather resembles the American short-stemmed type of the genus, *P. pyrrhus*. A more detailed description would be necessary to judge whether it is identical with the latter, or not.

Pyrrhoglossum stipitatum Sing., Sydowia **2**: 38. 1948.

A comparison of the type with material collected by Dennis in Trinidad (Bull. Soc. Mycol. Fr. **69**: 174. 1953) as *Pyrrhoglossum hepatizon* (see also Singer, Sydowia 5: 474. 1951) shows that the Trinidad species is identical with *Pyrrhoglossum stipitatum* rather than with *P. hepatizon*.

Galerina Earle.

The type studies referring to this genus will be incorporated in a monograph by A. H. Smith & Singer (in press).

Phaeomarasmius Scherffel.

Agaricus curcuma Berk. & Curt.

Spores 7.3—9.8 ⇌ 4.5—5 μ, mostly 8.3—8.8 ⇌ 4.3—4.8 μ, smooth, relatively well colored but with rather thin although not collapsing walls, pale rust color, suddenly contracted to a subacute apex when seen in frontal view and therefore at times almost appearing subangular, or almond shaped, in lateral view the inner side entirely applanate or very slightly concave; basidia 20—27 ⇌ 5.8—7.5 μ, (1)2—(3)—4-spored; cystidia none; cheilocystidia 20—58 ⇌ 4.5—11 μ, clavate, rarely almost vesiculose, cylindrical, or cylindrical-subcapitate, hyaline, few brownish, often with a small mucro, making the gill edge heteromorphous; hymenophoral trama regular; epicutis of pileus consisting of hyphal chains whereby many members of the chain are strongly shortened and almost subisodiametrical, 4.5—25 μ broad, the terminal cells varying from subulate or cylindrical to vesiculose-subclavate (37—41 ⇌ 17.5—19 μ) or even subglobose (e. gr. 33.5 ⇌ 25 μ), but basically elongate rather than forming an epithelium, nevertheless unusually variable; all hyphae with clamp connections, those of the cuticle strongly rusty pigment-incrusted. Carpophores between small and medium sized, naucorioid.

The type, no. 2913, from South Carolina (K, FH) is in good condition. It is close to *P. muricatus* (Fr.) Sing. (*Pholiota muricata* (Fr.) Quél.) (which see Lilloa **25**: 387. 1951), but differs in less cellular epicutis and in the shape of the cheilocystidia, also in slightly longer

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spores. It differs from the species (incorrectly as it seems*)) described as *P. erinaceellus* by Singer & Digilio (Lilloa **25**: 395. 1951)., in different cheilocystidia and a larger proportion of spherocysts in the cuticle. The species called *Naucoria curcuma* by Murrill (F 10003 from Kelley's Hammock, Alachua Co., Fla.) has non-reniform spores 6.5—7.3 ⇌ 4.2—4.5 μ, a truly cellular cuticle and (subcylindrical to) clavate cheilocystidia of 50—72 ⇌ 5.8—10.2 μ. It is a form of the rather polymorphous *Phaeomarasmius gracilis* (Quél.) in the sense of Romagnesi.

Crepidotaceae.

Crepidotus.

Agaricus auricula Berk. ex Cooke.

The type (K) from Tasmania has deteriorated so it can no more be analyzed. A nomen dubium.

Crepidotus citrinus Petch.

Spores 7—8 ⇌ 7—8 μ, globose, with strong imbedded spinules slightly projecting beyond the episporium so that the spore surface appears rough in optical section (oil immersion); clamp connections present. Carpophores more or less attached to substratum by a felty surface; no stipe.

The data indicated above refer to the type no. 3547 from Ceylon (K), collected by Petch August 29, 1912. There is also authentic material, collected September 11, 1916, no. 4874 in which the spores

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*) The true *Phaeomarasmius erinaceellus* (Peck) Sing. has the following characters:

Pileus „samovar" to „honey middle stone" in ground color, with deeper colored (pl. 15 J 12, M &P) pyramidal granules which, again, have deeper colored apices and are detersible (much more so than in the species described by Singer & Digilio under this name), semiglobose-convex, neither umbonate nor umbilicate, 15—22 mm. broad. — Lamellae „honey sweet" (M & P), close or subclose, ventricose, broad, with whitish edges, 3,5 mm. broad, adnate. — Stipe concolorous and with the same covering as the pileus, the latter also covering the lower side of the veil (if present), the apex subfibrillose and straw colored, entirely stuffed, equal or very slightly taoering, downward, 27—28 ⇌ 2—3 μ; veil almost annular or merely forming a sharply delimited zone at the apex; basal tomentum sordid whitish yellow. — Context mild. — Spores 6—8,3 ⇌ 3,8—4,8 μ, usually narrow, with applanate to concave inner side, well colored, smooth; basidia 24 ⇌ 6,8 μ, 4-spored; cheilocystidia 50—55,5 ⇌ 7,5—10,3 μ clavate to clavate-subcapitate, hyaline or with brownish contents, often wavy below; epicutis of pileus consisting of cells with or without a more elongate terminal member (even ampullaceous, e. gr. 42 ⇌ 18 μ), cells 24—27 ⇌ 13,5—20,5 μ, with pigment plaques, easily coming apart at the septa forming loose cells in the preparations, originally arranged in connivent erect chains; covering of stipe formed by similar structures but the elongate cells here dominating, few spherocysts present all hyphae with clamp connections.

On rotten wood, near Pellston, Emmet Co., Mich., U.S.A. July 9, 1953, coll. Singer, conf. A. H. Smith (who has seen the type).

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reach 7.2 μ in diameter and are not all geometrically globose but practically globose to subglobose, also with clamp connections. The two collections are not only identical with each other, but they are also identical with the Argentine collection reported under this name by Singer (Rev. Myc. **18**: 22. 1953). A very similar species, possibly a two-spored form of *C. citrinus,* was described by Imazeki & Toki (*Crepidotus sulphurinus* I. & T., Bull. Gov. For. Exp. Sta. Tokyo **67**: 38. 1954).

Agaricus leptomorphus Berk.

Spores 7.3—9.8 ⇌ 4.5—6.5 μ, punctate, immersed punctations not or scarecely projecting and not of deeper rust color than the episporium in NH_4OH; clamp connections present. The accompanying sketch by Archer shows a carpophore of the size of a larger *C. sphaerosporus* with dull ochraceous pallid pileus, dull ochraceous lamellae and no stipe; the pileus is slightly striate, with white dorsal mycelium; context white. The dried material shows a slightly tomentose pileus; it grows on dead dicot wood.

There is a second collection, aside from the type (K), which does not seem to have anything to do with the type. It has larger deep melleous spores with thick walls, and hyphae with clamp connections. It is closely related or identical with *Crepidotus austroafricanus* Pilát, see under *Pleuroflammula.*

The type collection and picture are identical, in almost every regard, with the Patagonian collections of *Crepidotus sphaerosporus* reported by Singer (Rev. Mycol. **18**: 23. 1953, referring to the type of that species, and Sydowia **8**: 13. 1954, referring to the collections from Neuquén, Patagonia). If the entire group of forms now combined in the species *C. sphaerosporus* is considered as a single variable species, *C. leptomorphus* (Berk.) Sacc. is the valid name for all its representatives since I can see no fundamental difference between the type of the latter species and the type of *C. sphaerosporus.* It is, however, possible to consider these forms as microspecies forming a stirps together with *C. eucalypti* (Torr.) Sing. and *C. cesatii* (Rab.) Sacc. This possibility deserves to be investigated before the European name (*C. sphaerosporus*) is dropped into synonymy with the Tasmanian one.

Agaricus phaeton Cooke & Mass.

The type (K) is in rather poor condition and was therefore not analyzed.

Agaricus stromaticus Cooke & Mass.

Spores as in *C. nephrodes,* strongly punctate and somewhat rough, about 7—7.5 μ in diameter; clamp connections present. A thin membranous hyaline mycelial mat is still visible; lamellae broad.

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This is the type (K). It is so close to *C. nephrodes* that the „stroma" from which it grows hardly justifies a specific separation.

Agaricus inandae Cooke.

This agrees with the preceding species in every particular, including the now weak sordid whitish mycelial mat from which the carpophores develop. The type (K) was compared with the type of *A. stromaticus,* and no differences could be discovered.

Crepidotus subaffinis Pilát.

Spores 7.3 ⇌ 5.3 μ, or 6.5 ⇌ 4.7 μ, smooth, without germ pore and with homogeneous walls, brownish melleous; hyphae without clamp connections; no gelatinous layer demonstrable. The lamellae are close, almost crowded, and the carpophores are relatively large.

The type (K) from Chamarel, Mauritius, coll. H. H. Johnston no. 10, was described by the collector as „whitish on both surfaces". The size of the carpophores and the closer lamellae seem to set it apart from *C. sublevisporus* Sing. The latter was also collected by Dennis and described by him as *C. albidus* Ellis. However, it cannot be that species because of the absence of clamp connections on the hyphae of the Trinidad material (K).

Crepidotus truncatus Petch.

Spores 5.8—6.5 μ in diameter, globose, with a distinct ornamentation of deeper rusty, constrasting spinules which scarcely project beyond the surface of the episporium; hyphae with clamp connections. The brown color of the pileus is due to spore masses deposited there but the cuticular hyphae are hyaline.

The type seems to be either *C. applanatus* or *C. nephrodes.*

Crepidotus velutinus Petch.

Spores 9—11 μ in diameter, globose, verrucose-punctate, without plage, some punctations prolonged into very short ridges. NH_4OH on carpophores: black. The structure of the carpophores is completely destroyed by moulds.

This is the type (K) from Ceylon. The spores are most extraordinary for *Crepidotus,* but they may pass as a giant type of spores of the kind found in *C. nephrodes.* It appears desirable to recollect this species in order to provide better material for an anatomical redescription.

Aschersonia mellea Berk. & Br.

Spores 5.8—7.3 ⇌ 4.8—5.2 μ, smooth with homogeneous walls; epicutis very thin, almost as in the type of *C. uber,* not gelatinous but beneath it there is a broad gelatinized zone which occupies more than half of the trama of the pileus; hyphae of gelatinized zone hyaline, about 1.5 μ broad; all hyphae without clamp connections.

The type, Thwaites no. 730 (K) was recognized as a *Crepidotus* by Petch and transferred by him. Pilát who revised both the type and Petch's collections also recognizes this species cor-

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rectly as *C. melleus* (B. & Br.) Petch. It differs from the closely related *C. uber* (B. & C.) Sacc. in having smaller spores.

Rhodophyllaceae.

Rhodophyllus Quél.

Pluteus grandis Peck.

The type of that species (NYS) is a *Rhodophyllus*. Since it may have been described under another name before, I do not wish to transfer it now.

Marasmius arachnoides Berk. & Curt.

Spores 7.8—8.5 ⇌ 6 μ, angular, of the symmetrical type, pinkish stramineous. There are two tiny carpophores. The arachnoid mycelium is not well visible at present.

The type (FH) is undoubtedly a *Rhodophyllus*. Dr. Dennis kindly told me that he has arrived at the same conclusion after studying the Kew type of the same species.

Rhodocybe Maire.

Agaricus noveboracensis Peck.

A large collection of this species in Massachusetts convinced the author that this species is distinguishable from *R. mundula*. However, more collections in northern Michigan and a comparison with the type material (NYS) seem to prove that none of the characters distinguishing the two species can be considered as constant. Consequently, *A. noveboracensis* Peck must be reduced to the synonymy of *R. mundula*.

Paxillaceae.

Cheimonophyllum Sing. gen. nov.

Genus Paxillacearum, habitu pleurotoideo, carpophoris mollibus, pigmento destitutis, hyphis tenerrimis, fibulatis, inamyloideis, basidiis sporisque hyalinis, inamyloideis; hyphis tramatis hymeniophoralis tenuibus tenui-tunicatis haud intertextis, regulariter vel subbilateraliter dispositis; sporis globosis vel subangulato-globosis, hyalinis, tenuiter vel subtenuiter tunicatis, inamyloideis, levibus; cystidiis nullis, sed hyphis cheilocystidialibus tenuibus, eis cuticulae pilei simillimis praesentibus. Typus generis: *Agaricus candidissimus* B. & C.

Agaricus candidissimus Berk. & Curt.

The type has all the characters enumerated above. The spores are 6—7.5 ⇌ (5.3) 6—6.7 (7.5) μ, hyaline, in alkali with thin to moderately thin (as in *Rhodophyllus*) walls, smooth, non-amyloid; cuticle of pileus made up by a trichodermium of very thin, thin-walled, more or less interwoven, hyaline filamentous hyphae with needle sharp to more rarely subacute tips, 1.5—3 μ diam.; similar hyphae making the gill edge heteromorphous; hyphae loosely arranged, non-amyloid, all hyaline and thin-walled.

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This is Sprague 1157 (FH). Identical material was collected by the author in Michigan (N 79, N 455, here spore print pure white), the Caucasus (as *Pleurotus septicus,* (W.) det. Pilát as *P. candidissimus*); material determined or revised by the author: Leg. Farlow, Sept. 1889, Shelburne, N. H., USA (FH); Leg. Linder, Maine, USA: leg. Doty, 723 Alsea Mts., Oregon USA (F), Trinidad, leg Dennis (spore print pure white).

Dennis was the first to indicate the exact color of the spore print which is white. This species has, however no relatives among the*Tricholomataceae, Hygrophoraceae, Amanitaceae,* and *Agaricaceae.* Schematically, it would key out in the *Tricholomataceae,* but it seems that the relatively closest group is the genus *Hygrophoropsis* which has the same consistence, spore color, etc., and a similar structure (trichodermial cuticle, hyphae with thin walls and clamp connections, tramal structure, etc.) It is not submitted that the position proposed for the new genus is an ideal solution, or that the affinity with *Hygrophoropsis* is very striking. Nevertheless, there is a possibility that an evolutionary line, leading from *Paxillus* by way of *Hygrophoropsis* toward the *Hygrophoraceae* or *Tricholomataceae,* finds itself expressed, at a certain level, by forms like the new genus proposed above. This hypothesis may explain the lack of white-pored agaricoid *Gastromycetes,* and one may suppose that the *Tricholomataceae* and *Hygrophoraceae* are derived from the complex of families formerly combined as Boletineae of which the *Paxillaceae* are an integral part. However this may be, *Agaricus candidissimus* is a very characteristic and rather isolated species, and cannot be forced into one of the existing genera. We redescribe it, under the name **Cheimonophyllum candidissimum** (Berk. & Curt.) comb. nov., in a forthcoming paper.

Paxillus Fr.

Agaricus velutiveps Cooke & Mass.;

Crepidotus pactolus Cooke ex Pilát.

The types (K) of the two species mentioned above are identical with each other, and, obviously, with *Paxillus infundibuliformis* Clel. — Spores 13—16 (18.3) ⇌ 4.5—5.2 (6.3) μ, smooth, fusoid to cylindrical, golden melleous, the largest ones with thick but rather homogeneous wall without germ pore, with suprahilar depression; basidia 33.5—48 ⇌ 7.3—9 μ, hyaline, 4-spored; cystidia, if present, inconspicuous; hyphae hyaline to pallid melleous, with numerous clamp connections. Pileus deep brown and velutinous, lamellae "chrome yellow" (according to the collector); appearance of a *Paxillus.*

The correct name for this Australian species is **Paxillus veluticeps** (Cooke & Mass.) Sing. comb. nov. It has the elongate spores of *Paxillus defibulatus* (but with clamps) and *P. boletinoides*

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(but without veil) and corroborates again the similarity between the fungous floras of Patagonia-Tierra del Fuego on one hand and Australia-New Zealand on the other.

Boletaceae.

Phaeogyroporus Sing.

Boletus sudanicus Hariot & Pat., Bull. Mus. Hist. Nat. p, 95. 1909 sensu Heinemann (ut *Phlebopus*).

This species was studied by Heim, and Heinemann based his descriptions partly on the data published by Heim. His interpretation is apparently correct.

Spores in shape and color typical for *Phaeogyroporus* 6.5—8.3 ⇌ 5.2—6.5 μ, smooth; hyphae of the carpophore including the basal tomentum with numerous clamp connections. Habit of *Phaeogyroporus;* basal tomentum olive colored.

Heinemann (Bull. Jard. Bot. E. 24 (2): 113. 1954) indicates "hyphae not clamped", a statement based on the material analyzed above (K). Because of an error of observation in this case as perhaps in analogous ones, Heinemann comes to the conclusion that *Phlebopus* and *Phaeogyroporus* are identical. This may be so, provided that the type material of *Phlebopus has* clamp connections. I was unable to study the type of *Phlebopus colossus* Heim at Paris, but the other species inserted by me in this genus (*Phlebopus*) are clamp-less, and in Heim's account I find nothing to indicate that his species has clamps. The two genera, as proved by the presence of clamp connections in Heinemann's material of *P. sudanicus* are undoubtedly distinct if accepted as described, and if *P. colossus* should turn out to have clamped hyphae in spite of indications to the contrary in Heim's account, there would still be a genus related to *Pulveroboletus* with clampless hyphae and most definitely different from *Phaeogyroporus.* I am still firmly convinced that the presence and absence of clamp connections is a character of major importance in the classification of the *Boletaceae* although it is a character requiring much time and patience on the part of the taxonomist using it. This is particularly so in case of a negative result which, aside from errors of observation, may also occur (in rare cases) as a consequence of the existence of occasional parthenogenetic forms, and a negative result should always be rechecked on material from another source.

Boletus sudanicus is, therefore, a species of *Phaeogyroporus.*

Phylloporus Bres.

Agaricus hypericon Cooke & Mass.

Spores 11.5—14.7 (16.5) ⇌ 6.5—7.2 μ, rather pale melleous-straminеous to subhyaline, often opalescent, thick-walled but with apparently simple wall, without germ pore, smooth, with or without a suprahilar applanation; basidia clavate, 9.2 μ broad; cystidia fusoid-

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ventricose, obtuse, hyaline, sometimes slightly thick-walled (up to 1 μ diam.), about 43 ⇌ 16 μ; small transversal squamules of the stipe ocher yellow, consisting of dermatocystidioid clavate elements chich are smooth, about 38 ⇌ 12.3 μ; hypae without clamps at most septa, at some septa possibly clamped.

The type from Melbourne, Australia, coll. Reader, June 9, 1887 (K), is in good condition and looks somewhat like a *Paxillus,* but, according to the analysis given above, belongs in *Phylloporus.* This is corroborated by the fact that the species was apparently redescribed by Cleland under the name *Phylloporus paradoxus* (Kalchbr.) Bres. Cleland mentions a greenish tint below the gills which points at blue autoxidation of the context. The combination **Phylloporus hypericon** (Cooke & Mass.) Sing. comb. nov. is proposed.

I have also restudied the type (K) of *Paxillus muelleri* Berk. but find it rather difficult to place that species in the classification. The spores are in color and shape more convincing as *Paxillus*-spores than spores of a bolete. I found many septa without clamps, but am not certain wheter the species is really clampless. The spores are 10.8—13.8 ⇌ 5.3—6.5 μ, smooth, much deeper brownish melleous than those of *Phylloporus hypericon;* basidia 36 ⇌ 6 μ, 4-spored; cystidia clavate, e. gr. 43 ⇌ 10 μ. Carpophores look like *Paxillus involutus.* This is most likely to be a true *Paxillus,* near *P. defibulatus* Sing. from Patagonia.

A second collection of *Agaricus hypericon* (K) comes from New Zealand, coll. Colenso. This is not identical with either of these species, but belongs in *Gymnopilus.*

Paxillus viridis Berk.

Spores 9—10.7 ⇌ 4.7—5.2 μ, ellipsoid-oblong to cylindrical or slightly fusoid, smooth, light melleous, without germ pore; cystidia numerous, versiform, chestnut colored inside; hyphae of the hymenophoral trama arranged in the *Phylloporus*-manner; all hyphae without clamp connections.

The type from Rio Negro, Brazil was collected on the ground in the forest and the collector, Spruce, indicated the color: "Planta tota viridis". It is difficult to decide wheter this color was present before autoxidation took place. If it is the result of autoxidation, it is probable that *Paxillus viridis* is the same as *Phylloporus rhodoxanthus* ssp. *foliiporus* (Murr.) Sing. Therefore, no transfer to *Phylloporus* is proposed at the present time although the species belongs there without any doubt.

Suillus S. F. Gray.

Pulveroboletus trinitensis Heinemann, Bull. J. Bot. E. 24 (2): 121. 1954.

Spores smooth, 10.3—11.8 ⇌ 4.5—5.5 μ, rather pale melleous; cystidia ampullaceous, 51 ⇌ 17.5 μ, with melleous to chestnut colored

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resinous incrustation; clamp connections none; the strongly projecting ridges on the stipe do not show on the type specimen and were not observed on the fresh carpophores.

The type from Trinidad (K), with its red hymenophore is so close to *S. piperatus* that it is more a question of species identification than of generic position. The species belongs undoubtedly in *Suillus*, sect. *Piperati*.

Boletus grevillei Klotzsch.

Klotzsch's type, with the original description and reference to Greville's *B. luteus* (which is *S. grevillei*) is still preserved at Kew. The specimens have all characters of the species often called *Boletus elegans*. It is *Suillus grevillei* (Klotzsch) Sing.

Boletus Dill. ex Fr.

Strobilomyces fasciculatus Cooke & Mass. Grevillea **20**: 4. 1891.

The spores of the type from Australia (K) are smooth, very pale melleous, about $9 \rightleftharpoons 4.8$ µ. This is not a *Strobilomyces*, but rather a *Boletus*.

Tylopilus Karst.

Ixechinus minus Heim, Rev. Mycol. **4**: 20. 1939.

There is a specimen under this name, dried in the normal way, which seems to be part of the original collection (PC) and referring at the same time to another specimen („Un autre examplaire en formol. 19. 2. 38" Decary) which must have been the one studied by Heim. The dried specimen studied by me was determined *Ixechinus minus* Heim and must be considered at least as an isotype. This specimen does not show any tendency toward separation of the tubes, and seems to be a very normal representative of the Boletaceae, in fact most probably a *Tylopilus* if the pores „nettement rosées" (Decary) may be taken as indication for the color of the spore print. Under the circumstances, one cannot help but assume that the separation of the tubes in *Ixechinus* is an artefact, and that the genus is most probably a synonym of *Tylopilus*. If this should be proved to be the case, a new name becomes necessary for the Madagascarian species since a *Tylopilus minor*, different from Heim's material, exists already (*T. minor* Sing., Mycol. **37**: 799. 1945).

Strobilomycetaceae.

Strobilomyces Berk.

Strobilomyces velutipes Cooke & Mass., Grevillea **18**: 5. 1889.

Spores about $9 \rightleftharpoons 6.8$ µ, finely punctate because of very thin, short spinules inserted in the episporium. Pileus with relatively small appressed or obliquely ascendant squamules, especially in the outer third.

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The type was collected by Bailey at Brisbane, Australia (K). The data obtained from it coincide very well with those published on the basis of a type fragment preserved at NY and mentioned by me in my bolete monograph, part I (Farlowia **2**: 113. 1945).

Strobilomyces nigricans Berk., London J. Bot. 4: 139. 1852.

Spores 13—16 ⇌ 12.3—14.5 μ, with a wide mostly not quite complete network formed by anastomosing thin but very high (1.5—2.9 μ) ridges which frequently perforate the perisporium, deep brown on paler ground, perisporium hyaline. The specimens are still squamose in the center; the stipe was apparently squarrose all over. Clamp connections none.

The type, no. 4, from Khasia, India (K) is different in spore characters from the species described under this name by Patouillard and commented on by me (l. c. p. 114), although *S. floccopus, B. nigricans* sensu Pat., and the type of the latter species are all closely related. A good species of *Strobilomyces,* well illustrated by Hooker's original picture.

Strobilomyces polypyramis Hooker fil. in Berk., Hook. J. Bot. **3**: 78. 1851.

Spores 11.5—13 ⇌ 10.3—12.3 μ, spinose or with occasional very short ridges among the spines, the spines equal and very high (1.8—2.9 μ). The carpophores are larger than those of *S. nigricans* and *S. montosus,* but the pyramidal ornamentation of the pileus, apparently being detersile, has been lost in the herbarium.

This is the type, no. 104 from Sikkim, India (K), accompanied by an original painting (also at FH). The spore ornamentation is similar to that of *S. confusus* Sing. but considerably more projecting. The two species are apparently different.

Strobilomyces montosus, Hook. J. Bot. **3**: 78. 1851.

Spores 10.3—14.5 ⇌ 9.7—12.7 μ, slightly rugulose from a very low and wide network of darker lines; hyphae without clamp connections. Pileus with high, floccose (soft), but not very easily detersile, erect scales, strongly shaggy even now; stipe also squarrose.

The low, relatively wide reticulation on the rather large spores characterizes the type of this species (K), F. Uapahar, no. 121.

Porphyrellus Gilbert.

Boletus lacunosus Cooke & Mass., Grevillea **18**: 5. 1889.

The species had to be renamed for nomenclatorial reasons (*Porphyrellus cookei* (Sacc. & Sydow) Sing.). It is closely related to *P. malaccensis* and *P. subflavidus.*

The type from Brisbane, Australia, no. 649 (also syntypes 670, 664, several fruiting bodies) is in good condition (K).

Spores 14.5—23.2 ⇌ 9.5—13 μ, with finely spinulose ornamentation which projects 1.2—1.5 μ and is imbedded in the outermost wall layer

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which is hyaline and seems to be the perisporium, mucronate at the apex but without germ pore and smooth at the apex thus showing a characteristic smooth snout, most frequently about 17.5 ⇌ 9.2 μ.

These data confirm the statement made by Cooke and Massee that the spores are 15 ⇌ 10 μ large, and consequently corroborate my own disposal of this species as a valid species of *Porphyrellus*. Another similar bolete, *Boletus megalosporus,* exists only as a picture at Kew. The spores are probably foreign, as discribed. With this scanty documentation, it seems to be best to consider *B. megalosporus* a nomen dubium or nomen confusum.

Boletellus Murr.

Strobilomyces ligulatus Cooke, Grevillea **20**: 4. 1891.

Spores 20—24.5 ⇌ 8—12.5 μ, entirely like those of *B. ananas* with the same secondary striations running transversely on the longitudinal wings and between them, but very slightly larger (as already indicated by me under *B. ananas,* Australian collections, Farlowia **2**: 125. 1945). All other characters, including the macroscopical ones, agreeing with those of *B. ananas.*

The type from Australia (Victoria) (K), represents what may be termed the Australian race of *B. ananas.* Further macroscopical studies will be necessary in order to prove that the Australian race is worthy of as subspecific name.

Strobilomyces pallescens Cooke & Mass., Grevillea **18**: 5. 1889.

The part of the type preserved at NY was already studied by me (Farlowia **2**: 125. 1945). The Kew type coincides with the New York fragment in every particular. The species is the same thing as *S. ligulatus* Cooke (see above).The American (slightly smaller spored) race was recently found by Martin & Welden in Panamá (no. 8198, trail from Casita Alta to Finca Lérida, Aug. 2, 1952, det. R. Singer) which extends its American area south to the American tropics.

Boletus ananaeceps Berk., Linn., Soc. Lond. J. Bot. **13**: 161. 1873.

Spores 18—23 ⇌ 6.5—6.8(7.3) μ, cylindrical, with longitudinal wings, wings not striate.

This is the type from Victoria, Australia (K). According to the accompanying picture no. 612, the context turns reddish, then bluish and at length brown; the pileus is whitish with obtuse tall warts. The spores are said to be orange brown but are painted ochraceous, the tubes are very long and the stipe is white. The species has been transferred to *Strobilomyces* by Saccardo. It is indeed a species of *Boletellus* and should be known as **B. ananaeceps** (Berk.) Sing. comb. nov. It differs from *B. ananas,* which has a more than superficial similarity, by the smooth wings of the spores and apparently

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also by the shape and color of the ornamentation of the pileus.

Boletus emodensis Berk., Hook. Journ. Bot. **3**: 48. 1851.

Spores as in *Boletellus ananas,* and as discribed in Singer, Farlowia **2**: 126. 1945, as *Boletellus emodensis* (Berk.) Sing., where the species was correctly interpreted.

Strobilomyces paradoxus Mass., Bull. Misc. Inf. Bot. Gard. Kew for 1909: 209. 1909.

Spores 18.2—21.2 ⇌ 8 μ, longitudinally winged with transversely striate wings projecting 1.3 μ and slightly spiralling. Veil grossly toothed, appendiculates on the margin and projecting. Carpophores medium sized, smaller than those of *B. emodensis.*

The type, Ridley no. 28 (K) has the same small scales as *B. emodensis* which has the same spores as described above although they appear to be narrower in *S. paradoxus.* Massee's spore measurements are completely wrong. Since the tropical species differs from *B. emodensis* also in color, this seems to be a good species of *Boletellus* which was correctly transferred to *Boletellus* by Gilbert (1931).

Strobilomyces rufescens Cooke & Mass., Grevillea **18**: 5. 1889.

Spores much like those of *B. ananas* but with smooth wings projecting up to 1 μ. Pores rather wide; tubes 17 mm. long; veil distinct strongly developed, marginal; stipe solid and reddish with brown streaks; scales of pileus smaller than in *B. ananas* and *B. ananaeceps,* color of pileus, according to original painting, reddish brown; stipe bulbous below.

The type, as described above is no. 685 from Brisbane, Australia, and appears to be quite different from both *B. ananas* and *B. ananaeceps.* The combination **Boletellus rufescens** (Cooke & Mass.) Sing. comb. nov. is herewith proposed.

Boletus squamatus Berk., Hook. J. Bot. **4**: 137. 1852.

Spores 13—17,5 ⇌ 9—10 μ, with transversely striate longitudinal wings, projecting 1.3 μ hyphae without clamp connections.

The type from India belongs undoubtedly in the section *Ananae* Sing. of the genus *Boletellus* as anticipated by me (Farlowia **2**: 128. 1945) on the basis of Hooker's original painting as preserved at the Farlow Herbarium. The spores are relatively shorter than in other species of this group, and justify specific autonomy. The combination **Boletellus squamatus** (Berk.) Sing. comb. nov. is proposed.

Boletus verrucarius Berk.

Spores 21—23 ⇌ 10.3 μ, with longitudinal wings which project 1.3—1.5 μ and show a transverse fine striation (ornamentation of spores as in *B. ananas*). Pores rather wide, tubes very long; pileus surface ornamented as in *B. ananas,* but chestnut color.

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The type from Sikkim, India (K) is therefore a representative of the section *Ananae* of *Bolletus*. This species is very closely related with *B. porphyrius*, but has slightly larger spores, and some other characters of its own. The combination **Boletellus verrucarius** (Berk.) Sing. comb. nov. is proposed for it.

Russulaceae.

Russula Pers. ex S. F. Gray.

Russula aeruginosa Mass., Kew Bull. for 1914, p. 73, 1914.

The type from Singapore (K) is pressed flat and heavily impregnated with mercury, and its preparation for microchemical study, or even for the examination of the structure of the various organs is rather difficult. On the other hand, the characters available are rather characteristic. The epicutis seems to consist of hyphous elements exclusively and these seem to form a cutis (but it is possible that there was originally a trichodermial layer, later depressed); dermatopseudocystidia none; spores hyaline, 6.7—7.3 ⇌ 6 μ, with the ornamentation projecting 0.3—0.5 μ.

Since this species is apparently different from other known tropical species, but homonymous with *R. aeruginosa* Krombh., Naturg. Abb. **9**: 13. 1845, the now name **Russula singaporensis** Sing. nom. nov. is proposed.

Tricholoma immaculata Beeli.

The type from the Belgican Congo (K-fragment) was pointed out to me, as being a russulaceous species, by Dr. Dennis. It is indeed a *Russula* of the group *R. hoehnelii, R. fragilissima,* etc., closest to the latter but according to the descriptive data given by Beeli, apparently different. Spores 8—10 ⇌ 7—8 μ, ornamentation projecting 0.7 μ, of type III a, III b, II, VIII (in order of decreasing occurrence), hyaline; basidia clavate, 4-spored, relatively long (e. gr. 40 μ), 9.3—13.3 μ broad; sterigmata relatively straight and long, 10—10.7 μ; cystidia of two types, (1) gloeocystidia, with oily contents, bluing deeply in cresyl blue mounts, ventricose, e. gr. 60 ⇌ 8.7 μ, but also longer and shorter; (2) other type of pseudocystidia (macrocystidia? — SV reaction unknown), not bluing in cresyl blue mounts, with banded contents, versiform; cheilocystidia scattered, "empty", broadly rounded above; hymenophoral trama regular-intermixed, with rather numerous spherocysts, but also with even more numerous hyphal cells; oleiferous hyphae numerous, 8 μ broad; epicutis — a trichodermium of hyphous and cystidioid elements, the latter often clavate or ampullaceous-ventricose, 27 ⇌ 6.7 μ, slightly thick-walled and opalescent; hypodermium — a cutis; all hyphae without clamp connections.

The new combination **Russula immaculata** (Beeli) Dennis is proposed.

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Russula purpureanigra (sic) Petch, Ann. R. Bot. G. Perad. **6** (3) : 200. 1917.

Spores 7 ⇌ 5.8 μ, ornamentation 0.3—0.4 μ high, of type II, III b. Margin of pileus acute; lamellae crowded.

The type (K) shows that this is a good species of section *Compactae* subsection *Nigricantes,* close to but apparently different from *R. densifolia.*

Russula grossa Berk.

The spores resemble those of *R. melliolens,* but with the uncertainty caused by the lack of so many essential characters in the original description, the species must be considered as incompletely known at least until topotypical material becomes available.

Russula armeniaca Cooke, Handb. p. 336. 1890 (sec. ed.).

Spores about 10.5 μ long, with an ornamentation projecting 0.7 μ, spinulose, of type VI, IV; hyphae of the cuticle projecting into the epicutis and intermixed with numerous primordial hyphae; dermatopseudocystidia absent in the cuticle of the pileus. Appearance of *Russula lutea.*

The type from Epping, England, Aug. 1888 (K) appears much redder now the pictures suggest. Nevertheless, there can be no doubt about the identity of this species. It is, as suggested by me before, the reddish tinted form of *R. lutea*: F. *luteorosella* Britz. Those who consider this a separate species are entitled to use C o o k e's binomial.

Lactarius (D. C. ex) S. F. Gray.

Panus reticulatus Berk.

Spores 9.8—10 ⇌ 9.2—9.8 μ, often 9.8 ⇌ 9.8 μ, subglobose and subisotopic as *R. puiggarii,* but somewhat asymmetrical, with a strong amyloid ornamentation of type III a to II—III b, with distant but not very thin anastomoses, 1.5—1.6 μ high. Pileus surface formed by a palisade of brown dermatocystidia with thick wall mostly clavate, but sometimes with subacute apex or with nodulose apex, e. gr. 30—31 ⇌ 5.8—6 μ, macroscopically with a fine reticulation as in many species of *Pluteus.* Context with numerous laticiferous vessels, hyaline, some brownish, and 9—14.5 μ in diameter. Structure of hymenium now not well visible since most basidia and cystidia are destroyed or badly collapsed. This has the habit of a smaller representative of the *Subdulcis*-group, and grew on a log. No veil and not much basal mycelial tomentum visible.

The type, S p r u c e no. 130, from Brazil (K) is undoubtedly a *Lactarius.* It seems to be close to *Lactarius adhaerens* Heim but lacks the abundant basal mycelium. The combination **Lactarius reticulatus** (Berk.) Sing. comb. nov. is proposed.

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Agaricus mitraeformis Berk., Hook. Lond. J. Bot. **3**: 186. 1844.

Spores 12.3—19.3 ⇌ 8—12 μ, with germ pore varying from distinct but not truncate or slightly truncate to indistinct (rarely), both in size and color of two types (smaller and larger, very pale melleous and melleous), all smooth, broadly ellipsoid to narrowly ellipsoid and sometimes slightly fusoid or cylindrical, in general rather variable; well preserved basidia not recovered. Carpophores variable in size, the largest with relatively moderately elongated pileus.

The type from Devil's Mount, South Africa (K) has already been revised by R. Heim, and our data coincide with his in every detail.

The smaller carpophores of this collection are very similar to the type of *Bolbitius liberatus* Kalchbr. = *Cyttarophyllum liberatum* (Kalchbr.) Sing. where the spores are more distinctly pored and often truncate, and cheilocystidia could be demonstrated in the type. The larger carpophores are very similar to a species determined as *B. mitraeformis* by Berkeley but apparently different, collected in the high Andes in Perú, with basically gastroid spores, with indistinct germ pore and consequently close to the other South American species, *Galeropsis allosperma* Sing. from Patagonia which, however, has larger and more constantly pore-less spores. The Peruvian plant is certainly a new *Galeropsis* (Febr. 1864, at Punas, Andes, 10.000 to 14.000 ft, coll. Pearee, K). Another specimen, also considered as conspecific with *B. mitraeformis* by Berkeley, was collected by J. E. T. Aitchison Oct. 1885 in Afganistan (K). This is identical with material recently received by the author from the same country and with the material from Central Asia and the Caucasus described by Lebedewa (as *Psammomyces plantaginiformis*) and commented on by me (Beih. Bot. Centralbl. B, **56**: 148. 1936). Basidia and spores are here more typically gastroid but with distinct germ pore, and no distinct cheilocystidia are encountered.

Conocybe besseyi var. madagascariensis (Pat.) Heim.

Spores about 12—15 ⇌ 7—11 μ, ochraceous melleous in NH_4OH, rusty melleous in KOH, not very deeply colored, with broad, often oblique, more or less truncate germ pore, smooth; basidia with conical, erect or oblique but never half-sickle-shaped sterigmata, more of the gastromycetoid type, (2—)4-spored; some ventricose bodies with central constriction were seen, but seem to be aborted basidioles rather than cheilocystidia. Pileus consistently rather broadly rounded above.

The type (PC) does not seem to be conspecific with the American type where I was able to demonstrate distinct cheilocystidia, in spite of the similarities of habit and spore characters. It also shows more

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typical agaricoid basidia than the variety *madagascariensis* and should be separated from the latter.

This opens up a question of fundamental importance: Is the American type generically different from the Madagascar specimens? Knowing only the species enumerated in Lilloa **22** (Agaricales in modern Taxonomy, p. 481) and the species from Central Asia determined by me as *Galeropsis desertorum* (ibidem p. 733) and South America (*Galeropsis allospermum* (Speg.) Sing., see Lilloa **23**: 239. 1950), I would have answered this question affirmatively. However, considering the data given under *Agaricus mitraeformis* Berk. above, it appears that in the case of *Galeropsis* we have the first example of a genus where gastroid forms gradually approach the agarics in the narrower sense in such a degree that it would be possible to insert some of the representatives of the genus, particularly such as *Galeropsis cucullata* (Shope & Seaver) Sing., in the Agaricales, were it not known that other species, not separated from *G. cucullata* by anything like a generic hiatus, are as gastroid and typically secotiaceous as for example *G. desertorum* sensu Sing. (i. e. *Galeropsis plantaginiformis* (Lebedewa) Sing.). Moreover, even if, in the end, a sharper distinction between the more agaricoid and the more gastroid species of the genus *Galeropsis* could be worked out — and I cannot fully exclude this possibility since the presence or absence of cheilocystidia may be a sharper character than can now be appreciated while data on this character are still missing in the descriptions available for at least three species —, the genus *Cyttarophyllum* can never be used for the agaricoid group as had been proposed by me until recently, since the type studies on Heim's material show clearly enough that *Cyttarophyllum* (Heim) Sing. is merely a synonym of *Galeropsis* Vel. & Dvořak, while *Psammomyces* Lebedewa is another. In view of the doubtful separability of the agaricoid group, typified not by *Conocybe besseyi* (Peck) Heim sensu Heim, i. e. by the description of *C. besseyi* (Peck) Heim in C. R. Acad. Fr., **192**: 291. 1931 which is var. *madagascariensis,* but by *Bolbitius cucullatus* Shope & Seaver, I refrain from proposing any new generic name for *Cyttarophyllum* (Heim) Sing. sensu Singer 1951.

Galeropsis desertorum Vel. & Dvořak.

The type of this species (PR), kindly lent to the author by Dr. A. Pilát, was available only in small fragments. The spores are at first ellipsoid without germ pore; later they develop a callus, i. e. a more or less papilliform apex which differs from the remainder of the spore wall in more hyaline character although both the continuation of the episporium and that of the endosporium are discernible; in a further development of the spores, not reached by all apparently mature spores of the specimen, a typically truncate but often not truly apical (rather located as much on the outer side of the spores as the

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hilar appendage points to the inner side) germ pore is formed where all layers of the spore wall merge into one colorless layer; size of spores 12.7—15 ⇌ 7.3—9.3 μ (from rare 2-spored basidia: 18—19.3 ⇌ 9.3 μ); basidia well preserved, short-clavate, more rarely short-ventricose, with (2—4) apical sterigmata which are typically (with a single exception seen) gastroid in shape, straight or curved, and in the latter case equal (not half-sickle-shaped), obtuse or acute; wall of basidia hyaline to pale brownish, measurements: 16.8—24 ⇌ 10.7—12.7 μ; cheilocystidia none seen at the edge of the lamellae. The spores, when mature, have the color of *Agrocybe*-spores, not more rusty, and somewhat in the middle between the color of the palest and the deeper pigmented type in *Agaricus mitraeformis* (see above).

G. desertorum is, consequently, a representative of the more gastroid species of the genus as which it had also been interpreted by the author in his previous papers treating the genus. This can now be stated with more certainty than by the mere comparison of the original description and illustration since the data given above are taken from the type of the type species of the genus. Dr. Pilát kindly writes me that the species was not found since 1930.

My impression is that *G. desertorum* is probably closest to the African representatives of the genus; it is certainly not identical with *G. plantaginiformis* (see below).

Psammomyces plantaginiformis Lebedewa.

This species was originally described from the Terek region (Northern Caucasus, LE), but identical material from Central Asia was at the same time examined by me, see Beih. Botan. Centralbl. B, **56**: 147-149. 1936. Since later studies on *Galeropsis* showed the presence of different spore colors, of heteromorphous and homomorphous edges according to the species, it was most desirable to examine more material from the same general region in order to determine whether *P. plantaginiformis* is constantly devoid of cheilocystidia, constantly rust-spored, and consistently showing basidia of a gastroid type. This was important inasmuch as only few basidia are preserved in the original material, and the spore color might be suspected of being dependent on the age of the spores, while cheilocystidia are often collapsed and easy to overlook. Additional material was subsequently discovered in Berkeley's herbarium (K, see under *A. mitraeformis*, above) and was also sent to the author from a collection of fungi (W) made by Gilli in Afganistan. Both collections show the following characters: Spores sometimes extremely variable in size and shape, viz. (1) small (10—11 ⇌ 6—6.5 μ); (2) medium broad (11—12 ⇌ 8.2—9 μ); (3) large and narrow (15—16.5 ⇌ 7.2—7.8 μ); (4) large and broad, the most numerous spore type in all collections, 14—16.5 ⇌ 7.8—10 μ; (5) gigantic spores (exceptional): 18 ⇌ 12.8 μ, 19.3 ⇌ 9.2 μ; 20 ⇌ 10 μ, etc. Color: deep chestnut ferrugineous in KOH, somewhat

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less rusty in NH_4OH, melleous ochraceous in detergent solution. The germ pore is present and truncate, very rarely some spores without a truncate pore. Basidia were plentiful in some carpophores; they are broadly cylindrical to ventricose below and somewhat narrowed to the rounded apex, 14.3—22.8 ⇌ 8.5—10.8 μ, with two, more rarely with 4, very rarely with 3 sterigmata, hyaline; conical-spine-shaped and symmetrical (i. e. not half-sickle-shaped), or cylindrical to filamentous and equal and flexuous with rounded tips not ascending from an oblique (toward the apex) to a vertical position, most frequently about 4.2 μ long, but also shorter or much longer; hyphae of the hymenophoral trama hyaline to pale brownish, some pigment-incrusted, thin- to moderately thick-walled, all with clamp connections; epicuticular layer of the pileus (peridium) consisting of shortened and broadened hyphae which at places are denser and more parenchyma-like, the cells either hyaline or brownish, 14—22 ⇌ 10—15.7 μ, seemingly forming a layer like the corresponding one in *Conocybe*, but definitely not hymeniform or palisadic. Trama of the tramal plates regular, consisting of mostly narrow hyphae which are little interwoven; surface of the stipe in its columella-portion without any dermatocystidia and without any differentiation in the outermost layer, all parallel and longitudinally arranged, with thin to slightly thickened walls, hyaline to slightly brownish at places; lower portion of stipe with the same structure; cheilocystidia and cystidia none; dermatocystidia on pileus none.

This analysis shows that the data obtained from my original study in 1936 are identical with those found in the additional material. *G. plantaginiformis* (Lebedewa) Sing. differs from *G. desertorum* Velen. & Dvořák not only in the smaller spores (this difference is likely to be due to the larger number of two-spored basidia in the former) but also in the much deeper and brighter color of mature spores in KOH.

We have, therefore, the following well defined species in the combined genus *Galeropsis (Secotiaceae)*, proceding from the more gastroid to the more agaricoid species:

1. *G. allosperma* Sing. (*Galera paradoxa* Speg. non Matt.) from the xerophytic region of Patagonia (Rio Chubut), characterized by the absence of a germ pore.

2. *G. plantaginiformis* (Lebedewa) Sing. from Afganistan (2 collections), Turkmenistan, and northern Caucasus (type), characterized by germ pore, and deep colored spores in KOH.

3. *Galeropsis* spec. from the Peruvian Andes, with spores of the color of *Agrocybe*-spores, 16—17 ⇌ 9.7—11 μ, rather symmetrical and relatively broad with incomplete germ pore.

4. *G. madagascariensis* (Pat.) from Madagascar, characterized by broader obtuse pileus, cf. no. 7.

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5. *G. mitraeformis* (Berk.) Heim from South Africa.

6. *G. liberata* (Kalchbrenner) Heim, also from South Africa.

7. *G. paradoxa* (Mattirolo) Heim from Abyssinia. This may be identical with no. 4.

8. *G. desertorum* Velen. et Dvořak from Czechoslovakia.

9. *G. besseyi* (Peck) Heim, from New-Mexico, North America, characterized by rounded apex of pileus.

10. *G. angusticeps* (Peck), from California, possibly a variety of the former, with more acute pileus.

11. *G. polytrichoides* (Zeller) Zeller, also from California, characterized by the presence of distinct cheilocystidia; spores only melleous and relatively narrow; all basidia 4-spored.

12. *G. cucullata* (Shope & Seaver) Sing., from Wyoming to the Pacific Coast of North America, characterized by the deep colored. rusty spores (as in *G. plantaginiformis)*, and long cheilocystidia.

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