TYPE STUDIES ON BASIDIOMYCETES VI

POR ROLF SINGER

RESUMEN

Estudios de tipos de Basidiomicetes VI. — Los tipos del Herbario J. Rick en el Colegio Anchieta, Porto Alegre, Brasil, fueron analizados y los lugares clásicos (São Leopoldo, Parecí, Estação São Salvador) visitados para la recolección de topotipos ; además, en la Sierra al norte de Porto Alegre, cerca de la frontera con el estado de Santa Catarina, se coleccionó (primeras colecciones micológicas de la zona montañosa !) para completar los datos sobre la micoflora de Rio Grande do Sul.

En el capítulo I se dan los resultados de los análisis de los tipos rickianos. La especie más interesante es *Braunia alba* Rick, una secotiácea intermedia entre *Gastromycetes* y *Agaricales* (*Volvariella*).

En el capítulo II, las especies coleccionadas por otros, especialmente por el autor, se enumeran y, cuando parece necesario, se describen. Varias especies son nuevas, por ejemplo la primera especie de *Tricholomopsis* observada en Sudamérica, *T. araucariae,* y notablemente muchas especies de *Galerina*. *Galerina sphagnorum* (Pers. ex Fr.) Kühner, *Crepidotus uber* (Berk. & Curt.) Sacc., *Marasmiellus byssisedus* (Bres. ex Rick) Sing., y *Gyrodon rompelii* (Rick & Pat.) Sing. son redescritos. Observaciones en el campo sobre relaciones de micorriza entre *Gyrodon rompelii* y *Cormophyta* de la flora indígena riograndense parecen probar que este hongo crece en conexión con las raíces de varios árboles de la familia *Santalaceae*.

En el capítulo III, se prepara y analiza una lista de *Agaricales* observados con seguridad en Rio Grande do Sul. Solamente 22.5 % de las especies americanas de esta lista se encuentran igualmente en la selva Boliviano-Tucumana, 17 % de las especies americanas también se encuentran en Florida, EE. UU. Solamente 21 % de las especies se encuentran igualmente en las zonas templadas del hemisferio norte y 18 % son especies « europeas », i. e. formas casi cosmopolitas, formas adventicias, o formas con áreas aisladas. Estas últimas son especies del *Sphagnetum* serrano en Taimbesinho (*collybia dryophila* var. *Coedipus, Psilocybe uda* (Pers. ex Fr.) Gillet sensu Sing., *Galerina sphagnorum* (Pers. ex Fr.) Kühner).

The present *Type Studies* [1] are concerned exclusively with the Basidiomycetes, especially the Agaricales (agarics and boletes) of the State of Rio Grande do Sul, as they were studied between 1904 and 1946 by the Rev. João Rick S. J., with some additional observations on these fungi during a trip devoted to the exploration of the type localities of the Rickian species carried out by the author in spring 1951. In addition to these type studies on herbarium material and fresh Basidiomycetes in Rio Grande do Sul, a special excursion to a region never visited by Rick nor as far as known by any mycologist, or collector of Basidiomycetes, was organized in order to round out the present knowledge on the basidiomycetous flora of the state. This latter trip was bound for the « Serra » in the northern limits of the state at the border of Rio Grande do Sul and Santa Catarina where we found a very distinct although (for seasonal reasons?) scanty basidiomycetous flora, quite different, in many aspects, from that of the eastern and central part of the state of Rio Grande do Sul. The investigations in South Brazil were necessary not so much from a phytogeographic point of view, or because a large number of thus far unknown species was expected, as rather for the reason that in Southern South America as well as in tropical South America, conscientious work on the taxonomy of the Agaricales and other groups of Basidiomycetes cannot be carried out unless Rick's work is carefully revised, his new species compared with those described by C. Spegazzini from adjacent regions (Argentina, Paraguay, São Paulo-Brazil) since obviously many species are common to these regions, yet, their possible identity could not be established on the basis of the descriptions given by these authors. In my former *Type studies,* I have endeavored to redescribe, or provide essential anatomical data, on the species described by Spegazzini (*Type Studies on Basidiomycetes* IV, *Type Studies on Agarics* III); besides, Spegazzini's classical localities were visited and topotype material was collected. The same approach was then attempted in regard to Rick's territory. Some previous studies on material sent by Rick to Farlow Herbarium, Harvard University, gave the opportunity to see material from localities not visited during my trip to Rio Grande do Sul, and in addition, provided a certain amount of « background » saving

[1] The former series of *Type Studies* have appeared in *Mycologia* **34**: 64-93. 1942; *Lloydia* **5**: 97-135. 1942; *Mycologia* **35**: 142-163. 1943; *Lloydia* **9**: 114-131. 1946; *Mycologia* **39**: 171-189. 1947; *Lilloa* **23**: 147-246. 1950; *Lilloa* **25**: 463-514 (1951) 1952; *Sydowia* **6**: 344-351. 1952.

much time and tribulation. It is not possible to pretend that the present type studies on Rick's material are complete. They are incomplete, even as far as the Agaricales are concerned. The genera *Mycena, Lepiota, Psathyrella, Deconica, Rhodophyllus,* and the genus *Polyporus* have been studied rather superficially since it was considered useless to go deeply into the taxonomy of groups now worked out by specialists although it was thought to be essential that all species, even those of the genera just mentioned, should be determined generically so that specialized type studies can be carried out later without the necessity of going through the entire herbarium all over again; for the generic determinations of Rick's species were never quite reliable, and are altogether spurious in the light of modern classifications based on anatomical data. Some of the species now considered valid, may yet be considered as synonyms by further investigations aimed at a complete knowledge of all the types described from tropical South America. This cannot be helped since some of Hennings'material from Central Brazil has been lost at Berlin but duplicates come to light from time to time in other herbaria. Furthermore, not all the species described by Montagne, Berkeley, and a few other early mycologists have been restudied, and some of these may occur in Southern Brazil where they possibly duplicate some of Rick's or Spegazzini's species. Nevertheless, it is here assumed that such future changes in specific epithets will not largely affect the results of our type studies, and it is furthermore believed that the number of such cases will be comparatively small.

The Herbarium J. Rick now preserved and kept in good order by Rev. B. Rambo at the Colegio Anchieta, Porto Alegre, R. G. d. S., Brazil, contains a large number of Basidiomycetes, especially Aphyllophorales, but also many Agaricales. A number of species described by Rick has not been found in the collection, nor is there any indication that it may be found either at Washington or Farlow Herbarium, nor in some European herbarium. These species, if not re-collected either at the type locality, or some similar locality by others, must, in the majority of the cases, enter the list of *nomina dubia.* Their descriptions almost entirely or entirely macroscopical, and even at that extremely short, cannot serve as a basis for later recognition. Where the type itself has been lost, but authentic material been proposed — often by Rick himself — as neotype, the latter was accepted as the basis for the identification of the species unless the characters of the neotype are in obvious contra-

diction with the original description. Rick was of the opinion that the preservation of types is a matter of minor importance and that « his herbarium was Nature ». Moreover, he adhered to the opinion, often expressed in his numerous papers, that the Brazilian mycoflora differs but little from the European mycoflora. Many specimens were determined as identical with European Basidiomycetes which, however, do not occur in South America. Other species were determined according to descriptions — mostly Saccardo's — and in these cases, the redescription given by Rick is mostly an exact copy of the original description or else the description available to Rick. This makes it very difficult to link these species with species actually occurring in Rio Grande do Sul, and the material preserved lacks, in most cases, the pertinent original notes from Rick's own observation. Under these circumstances, it was not to be expected that material considered by Rick as already described, and still preserved at Porto Alegre, would yield many important new data, and even where a definite identification could have been achieved, the scientific value of the reexamination would have been largely floristic. Since it was not the main purpose of this work to provide a list of Rio Grande fungi as complete as possible but rather a revision of Rick's «nova», the specimens determined by Rick as « old » species were in many cases neglected, in fact every time when such an analysis would have been time-consuming without promising useful results. In Rick's herbarium, one does not find many species described by Theissen. It is, for example, unknown where at present, the *Marasmii* of Theissen's *Marasmii-studies in Rio Grande do Sul* are preserved, and if they are preserved at all. Some of Theissen's material is at the Farlow Herbarium; some may be in Europe. Other Theissen specimens have been distributed by Rick in his Fungi Austro-Americani. These exsiccata are available everywhere, and no special effort has been made to restudy them, inasmuch as no complete series is available at Porto Alegre. On the other and, there are, in Rick's herbarium, numerous species presumably new, or believed to be new, with herbarium names, never published by Rick. If, according to our type studies, such a species turns out to be actually undescribed, Rick's proposed herbarium name is used, wherever possible.

The territory where Rick collected is practically identical with the boundaries of the State Rio Grande do Sul. He described only a couple of species from outside the state, and these were sent to him by correspondents. Rio Grande do Sul is, phytogeographically, characterized by a remarkable geological, climatical, altitudinal, and phytosociological heterogeneity. Granites, sandstone, and basalt form definite zones from the coastal regions towards the Uruguay River, the yearly rainfall, — rather high generally — is different in different subdivisions of the State, and the temperature is, in a yearly average, rather different in various parts, especially in the mountains (Serra) along the northern border and the hilly portions of the Eastern and Central parts of Rio Grande do Sul. Those collections that came from the locality called « Taimbesinho » (at 29° lat. and 50 1/2° long.) were collected at approximately 1000 m altitude in a region where morning frosts are common in spring, and snow falls in winter. The plateau is characterized by the presence of Sphagneta in open grassland vegetation, which, toward the steep mountain sides is replaced by large stands of *Araucaria,* often almost pure at their upper fringes, or mixed with various frondose trees (e. gr. *Ilex microdonta*), *Podocarpus,* and tree ferns. The lower hill country consists exclusively of subtropical forest, alternating with grasslands. The latter were not explored mycologically since their mycological flora was poorly developed during the time of my visit, and also because the mycoflora of the subtropical forest promised more immediate interest. Unfortunately for the botanist, vast regions of original Araucaria forest are being destroyed now due to the extensive wood cutting activity in these regions, and the original subtropical forest of the lower land exists now only in fragments, having been replaced by the fields and plantations of the settlers. Large tracts of former native forest have been planted with Acacias, or have been reforested by fast-growing trees such as Eucalyptus. The Eucalyptus woods yield little of interest, the Acacia woods nearly nothing at all. It was therefore desirable to study some almost untouched original subtropical forest — such as that at Estacão São Salvador — as long as it remains unaltered. It would be highly desirable to establish National or State Reserves in this region as this as been done in Argentina. Among the trees of this original forest, the order *Fagales,* the most important one for mycorrhizal hosts of higher fungi, is completely absent, and in the *Salicales*, only *Salix humboldtiana* is observed along the rivers and in marginal forest. The native conifers are not mycorrhiza-bearing according to my observations in Brazil and Argentina. This does not mean that there are no mycorrhizal fungi in Rio Grande do Sul. In the contrary it is almost certain that e. gr. *Gyrodon rompelii* is mycorrhizal (see p. 128), and it may be that some

of the *Russulaceae* observed here are mycorrhiza-forming. Yet, as far as the latter are concerned, no fresh specimens have been studied by me, and the question must remain open. Nevertheless, the percentage of species forming ectotrophic mycorrhiza with forest trees is extremely small, especially when compared with regions where *Fagales* and mycorrhiza-bearing conifers are common, such as the Alneta of the Western part of the Continent, and the Nothofageta of the South. According to convincing observations by Father Rambo, the forest flora in this part of Brazil is advancing in relation to the open « campo » which may mean a gradual movement of floral elements from the north (Central Brazil) and the Misiones region towards the south. This would characterize the native forest as a pioneer vegetation, of mainly Central Brazilian origin, with high adaptability to the climatic conditions encountered in the South. If it may be assumed that this condition also holds true for the mycoflora, it appears correct to start studies on the Brazilian mycoflora here since the knowledge of the fungi of Rio Grande do Sul would then offer a basis and a stepping stone for the investigation of the vast wooded areas, still so little explored, of the Central Brazilian states. However this may be, as a southern margin of the subtropical-tropical mycoflora of the East, it would be interesting to compare the fungi observed in Rio Grande do Sul with those observed in another subtropical-tropical forest region of South America, also representing the souther extension of a large wooded area: the Selva Tucumano-Boliviana. The mycoflora of the latter is rather well known compared with other floras of South America. Consequently, I have attempted to edit a list of species now actually proved to occur in Rio Grande do Sul. This floristic result of the present studies is necessarily rather poor. It represents, I estimate, only a fraction of the species actually occurring. Nevertheless, while many of the genera are studied completely while others are not studied completely or not at all, the average percentage of species common with regions known mycologically more completely than that of South Brazil, should give us an approximate idea of the distribution of the species occurring in Southern Brazil and perhaps make it possible to draw some conclusions regarding the origin of this flora.

It is a pleasure to acknowledge the extremely valuable help given to me by the Rev. Padre Balduino Rambo, S. J., his permission to study the types at the Colegio Anchieta, equipment and transportation put at my disposal, advice in regard to the phanerogamic flora and geography of the State, and innumerable courtesies. Without the cooperation on his part, and the hospitality shown us in the various Jesuit schools and homes — all classical localities — it would have been impossible to accomplish the work actually accomplished, and even a fraction of the data accumulated would have required much more time.

The following resume is subdivided in several chapters, the first and most important being the type studies proper based on Rick's herbarium specimens, and on his original accounts. The second chapter is concerned with the author's own collections at Porto Alegre (Vila Manresa), São Leopoldo, Parecí, Estação São Salvador, and Taimbesinho. A few specimens collected by Steffen and Sehnem, former collaborators of Dr. Rick have been added. On the basis of this material and the data available through the type studies, a new list of Agaricales occurring in the State of Rio Grande do Sul is compiled, forming chapter III which is followed by a few statistical conclusions.

I. RICK'S TYPES

The enumeration of the species follows Rick's latest paper on Agaricales, *Lilloa* **1**: 307-358. 1937; **2**: 251-316, 1938; **3**: 399-455. 1938; **4**: 75-104. 1939, which appeared under the title *Agarici Riograndenses* part I-IV (part V is an index); we intercalate species later neglected by Rick, and add the Boletaceae at the end of the enumeration, where we also treat a few selected species of other orders of the Basidiomycetes.

Amanita bresadolae (Rick) Rick, *Lilloa* **1**: 308. 1937; non Schulzer (1885).

This was originally described as *Armillaria bresadolae* Rick, *Broteria* **6**: 71. 1907. Rick believed later that this is an Amanita, but it is not identical with *Amanita bresadolae* Schulzer which, according to Gilbert, is a *Volvariella* spec. Spegazzini insisted that Rick's species is identical with his *Armillaria ameghinoi* which, in reality, is an Amanita, *Amanita ameghinoi* (Speg.) Sing. However, Rick's specimens preserved at the Farlow Herbarium, is neither an Armillaria nor an Amanita, nor even a Volvariella but a Lepiota; yet a

transfer to *Lepiota* is not possible since a *Lepiota bresadolae* already exists, and consequently, the new name *Lepiota crassior* Sing. is herewith proposed. The spores are thick-walled, rather small (5-6.3 × 3.4-4.2 μ), smooth, and pseudoamyloid, stramineous in NH_4OH, without germ pore and spur, and no distinct metachromatism in cresyl blue stains has been observed. I saw no spherocysts on the surfaces of pileus or stipe, but the specimen does not lend itself very well to anatomical studies of the cuticle.

Amanitopsis plumbea Rick, *l. c.* p. 309.

This is probably a homonym (I have not enough literature at hand to prove it). More data will be needed to decide whether or not Rick's species is different and independent.

Tricholoma brasiliense Rick, *Broteria* **6**: 72. 1907.

This was shown to be *Leucopaxillus brasiliensis* (Rick) Singer & Smith by Singer & Smith, *Pap. Mich. Acad. Sc., Arts & Lett.* **28**: 124. 1942 (1943).

Tricholoma sulphurellum Rick, *Broteria* **17**: 102. 1919.

No material found at Porto Alegre. If identical material cannot be found it must be considered a nomen dubium.

Tricholoma atroolivaceum Rick, *Lilloa* **1**: 312. 1937.

Type material exists. However, it is badly preserved and it was impossible for me to obtain the pertinent data on the structure of the cuticular layers, and on the structure of the lamellae. The spores are extremely numerous, not quite hyaline now, sticking together, smooth, 3.5-4.5 × 2.7-3.5 μ, non-amyloid. The hyphae are likewise non-amyloid, with clamp connections. This may be a Hygrocybe, Mycena, Limacella, most likely Limacella. With the characteristic color of the pileus and the viscidity of both pileus and stipe to go by, it should be easy to identifiy this species, if recollected, especially with the incomplete anatomical data at hand, as indicated above.

Tricholoma sericeum Rick, *Broteria* **18**: 52. 1920.

There are no specimens in the Rick Herbarium. This is a nomen dubium.

Tricholoma subcinerescens Rick, *Lilloa* **1**: 313. 1937.

There are no specimens in the Rick Herbarium. The description suggests a species of the *Agaricaceae* in the strict sense, probably *Lepiota* sensu lato.

Tricholoma steffenii Rick, *Broteria* **24**: 99. 1930.

There are no specimens under this name. However, under the name of *Collybia Steffenii* Rick (herbarium name), we have found three collections, one of which was collected in 1930 and may be the type of *Tricholoma steffenii* if it is permitted to guess that Rick changed the herbarium name by transferring the species to another genus when writing his manuscript. The specimen comes indeed from São Leopoldo and was collected by Steffen. It has large globose echinate spores as indicated by Rick for *Tricholoma steffenii*, and his remark « forsan melius Collybia » which he later substituted for « forsan ad Russulam ducenda species » may also be interpreted so as to suggest that Rick was eventually convinced that the species should be a Collybia and left the pertinent material under Collybia in the Herbarium. Yet, in his unpublished manuscript written in 1945-46, he still calls this fungus *Tricholoma steffenii*. It appears to me that on the basis of these data, the specimen no. 12341 should be recognized type of *Tricholoma steffenii*, even though one may also take the formal position that this latter binomial is not substantiated by a type specimen, and therefore a nomen dubium. If the type is recognized as belonging to the description, it would appear that *Oudemansiella echinosperma* Sing., also described from Rick material from Rio Grande do Sul (named *Collybia napipes* by Rick), and common in all subtropical and tropical forests of South America, is identical and antedated by Rick's own epithet. The latter must then be transferred to *Oudemansiella* since the type (12341) is identical with my species in every particular, macro- as well as microscopically. It was, of course, impossible to guess that a species macroscopically so similar to the common northern *Oudemansiella radicata* might have been described in the genus *Tricholoma*, and without an intimate know-

ledge of the Rick Herbarium as a whole, it would never have been possible to connect the two species. But in consequence of what was said above, the new combination *Oudemansiella steffenii* (Rick) Sing. = *Tricholoma steffenii* Rick = *Oudemansiella echinosperma* Sing. is proposed.

Tricholoma diabolicum Rick, *Egatea* 11 : 16. 1926.

No type specimen has been found.

Armillaria bresadolae Rick, see *Amanita bresadolae* (Rick) Rick.

Armillaria procera Speg. sensu Rick, *Broteria* 6 : 71, pl. 8, fig. 3. 1907.

In the sense of Rick, this species is undoubtedly identical with *Pleurotus rickii* Bres., a species quite common in Rio Grande do Sul and in other parts of subtropical South America. In the sense of Spegazzini, it is identical with *Armillariella puiggarii* (Speg.) Sing., common in Central and South Brazil, in the Rio de la Plata region and north to the provinces of Tucumán and Salta to Jujuy. This latter species was called *Armillaria mellea* by Rick (see the following species).

Armillaria mellea « Vahl » sensu Rick, especially var. **chlorina** Rick, *Broteria* 5 : 24. 1906.

Although congeneric with *Armillariella mellea*, this is not the same species but identical with *Armillariella puiggarii* (Speg.) Sing. redescribed by Singer in *Lilloa* 23 (1951); fresh material was likewise collected, and Rick's photograph proves the identity with the latter.

Armillaria carneogelatinosa Rick, *Broteria* 18 : 52. 1920.

The only specimen, obviously the type, is preserved under no. 12246. The spores are nonamyloid, smooth, about $8.5 \times 5.5\ \mu$; the hymenophoral trama is regular and non-gelatinous; the epicutis of the pileus consists of thickwalled, pallid, erect elongate elements forming a trichodermial palisade. Consequently, the species is identical with *Xerula chrysopepla* (Berk. & Curt.) Sing. (see *Type Studies on Basidiomycetes* II, p. 156).

Armillaria rhagadiosa « Fr. » sensu Rick, *l. c.*

The only material in existence (no. 20901 from São Salvador, leg. & det. Rick, April 22, 1944) proves that this is the name under which Rick knew what is now called *Ripartitella brasiliensis* (Speg.) Sing.

Armillaria mucida « Schr. » sensu Rick

The evidence shows that Rick consistently, in publications as well as in the herbarium, named *Armillaria mucida* what is now determined as *Oudemansiella canarii* (Jungh.) Höhnel, at least its South American form whose specific identity with the Asiatic type is very probable. This is what Spegazzini called *Oudemansiella platensis,* common in the La Plata region and in the Selva Tucumano-Boliviana, also in South and Central Brazil, Paraguay, Bolivia, Perú, and apparently Northern South America, very common in the West Indies and in Florida, U.S.A. As I have pointed out before (see *Type Studies on Basidiomycetes* V, 1951), Rick's statement that the globules inside the spores are spermatozoids of some parasite, and that the species is merely a parasitized state of the European *Oudemansiella mucida*, is erroneous. The globules in the spores are oil droplets. Var. *favacea* Rick is evidently only a polyporoid-favoloid form of the common species.

Lepiota procera forma **bonaerensis** (Speg.) Rick, *Lilloa* 1: 318. 1937.

Specimens distributed by Rick (Fungi Austroamericani 188) and preserved at the Farlow Herbarium are correctly determined, but the species is better kept autonomous as *Macrolepiota bonaerensis* (Speg.) Sing.

Lepiota molybdites « Meyer » and **Lepiota morgani** « Peck » sensu Rick, at least the latter.

Are correctly determined and should be known as *Chlorophyllum molybdites* (Meyer ex Fr.) Massee.

Lepiota rubrosquamosa Rick, *Broteria* 18 : 50. 1920.

Authentic material deposited at the Farlow Herbarium and other material deposited under similar herbarium names (*Lepiota rubrofibrillosa*, etc.) collected at Serro Azul, São Canisio do Porto Novo,

etc. belongs to an interesting species (*Leucoagaricus rubrosquamosus* (Rick) Sing. *Lilloa* **22**: 422. 1951) which is characterized by red pileus (pink-salmon-red) and strongly ornamented spores; the latter are 10.5-11 × 7-7.3 μ (not as Rick says 4-5 × 3-4 μ) pseudoamyloid, smooth when young, reticulate when old, the reticulation formed by a layer of the spore wall which becomes deep violet in cresyl blue mounts, ellipsoid, without a spur, without germ pore, without suprahilar depression, with little developed endosporium but showing an indistinct metachromatism with cresyl blue, or nearly none at all, heterotropic, warty in outline; epicutis of the pileus consisting of large elements (27-70 × 11-21 μ) which are yellowish hyaline in NH_4OH, clavate-vesiculose, pedicellate, and forming a hymeniform layer; basidia 33 × 11.7-13 μ, thin-walled, 4-spored; cheilocystidia 25 × 4 μ; hyphae non-amyloid, without clamp connections.

Lepiota confusa Rick, *Lilloa* **1**: 341. 1937.

The type of this species could not be studied. However, authentic material preserved at the Farlow Herbarium agrees well with the original description. This species is characterized by its colors, the smooth spores with an extremely thin metachromatic endosporium, without a distinct germ pore, or without the trace of a germ pore; exosporium blackish violet but extremely thin and homogeneous when seen in cresyl blue mounts; episporium hyaline in cresyl blue and NH_4OH. The terminal members of the palisade forming the cuticle of the disc of the pileus are septate, 15-65 × 6.5-13 μ. The trama of the stipe consists of hyphae without clamp connections. This is undoubtedly a Leucoagaricus, near *L. rubrotinctus* and *L. rubrosquamosus*. Its correct name is therefore *Leucoagaricus confusus* (Rick) Sing. (Lilloa **22**: 422. 1951).

Lepiota olivaceomammosa Rick, *Broteria, l. c.*

Since Rick created a confusion saying that his original *Lepiota olivaceoconfusa* is a variety of *Lepiota mastoidea*, yet maintaining the species, evidently on the basis of later collections, I used a Rickian herbarium name, viz. *Lepiota olivaceomamillata* Rick intentionally or unintentionally substituted for *Lepiota olivaceomammosa*, transferring this name to Leucoagaricus in *Lilloa* **22**: 422. This species has the microscopical characters of *L. confusus* but differs in some smaller details as well as in the olive colored umbo.

Latin diagnosis: *Leucoagaricus olivaceomamillatus* (Rick in herb.) Sing. (1951) ex Sing. spec. nov. *A* L. confusa *differt pileo centro olivaceo*. Rio Grande do Sul, leg. J. Rick, typus in Farlow Herbarium.

What the original *Lepiota olivaceomammosa* actually is, could not be established.

Schulzeria flavida Rick, *Lilloa* **1**: 344. 1937,

The types comes from Santa María, 1936, no. 14871. I suspected this species to be identical with one from Tucumán showing all the characters of *Schulzeria* but differing in some details from all valid genera of the Agaricaceae. Cf. Singer in *Lilloa* **22**: 444. 1951. However, the type of Rick's *Schulzeria* is a typical *Lepiota* and should be known as *Lepiota flavidula* (Rick) Sing. comb. nov. It probably lost its annulus on the way to the laboratory. The spores are not metachromatic in cresyl blue mounts; they have a dorsal (outer side) depression and a suprahilar applanation, homogeneous moderately thin wall, and are quite smooth, pseudoamyloid, hyaline in ammonia, 7.5-8 × 3.5-4 μ. The epicutis of the pileus is not cellular.

Lepiotella brunnea Rick, *Lilloa* **2**: 251. 1938.

This new genus and species is represented by several collections, all identical with each other and with the data given in the original description. One authentic collection by Steffen was determined by Rick, no. 20592, February 18, 1946 (one of Rick's last determinations!), São Leopoldo, on the earth. The volva is here quite distinct, saccate and membranous. The annulus appears adnate here but it is possible that it separates eventually. The squarrulose pileus and stipe give it an appearance somewhat different from the other genera of the Leucocoprineae. The medulla of the stipe shows many hyphae without clamp connections side by side with many clamped hyphae. The spores are pseudoamyloid, smooth, with compound wall, with germ pore, about 10.5 × 7.5 μ. *Lepiotella*, consequently, differs from *Chlorophyllum, Leucoagaricus* and *Leucocoprinus* in the presence of clamp connections which makes it seem probable that it is merely a volvate Macrolepiota (Lepiotas of the procera-type). Nevertheless, Rick has seen no spores in his specimens, and it is therefore quite uncertain, in spite of the white lamellae, whether or not the spore print on white paper is pure white. As long as the presence or absence of clamp connections in *Clarkeinda* and the exact spore

color of *Lepiotella* Rick are unknown, a final disposal of the latter cannot be made. The generic name *Lepiotella* is a homonym, and should not be replaced by a nomen novum before the identity with either *Macrolepiota* or *Clarkeinda* has been proved to be impossible. For the purpose of this present paper, we accept Rick's original name (although it is not legal) on a temporary basis.

Clitocybe nauseosa Rick, *Broteria* **17**: 103. 1919.

The type has been lost. However, there is material marked « cotype » which Rick meant to designate a neo-type, no. 21027, from São Salvador, January 29. 1944. The spores are hyaline, nonamyloid, smooth, ellipsoid, 4.8-5.5 × 3.5 μ; basidia 4-spored, narrow; cystidia and cheilocystidia none seen, except for some diverticulate irregular elements at the edge; hymenophoral trama irregular; subhymenium well developed, consisting of very short interlaced elements; epicutis of the pileus consisting of repent hyphae which are strongly diverticulate, with erect excrescencies and nodose horns, ramifications, etc. This is, consequently, a Marasmiellus, *M. nauseosus* (Rick) Sing. comb. nov., widely distributed in South America. A complete description has been published in *Lilloa* **25**: 149. (1951). 1952.

Clitocybe cyanea Rick, *Ann. Mycol.* **2**: 3. 1904.

The type (no. 12906) was found densely gregarious on wood at São Leopoldo, 1905. The spores are 2.8 × 2 μ, smooth, hyaline, nonamyloid. Otherwise everything coincides with my description of *Calocybe cyanea* Sing. (*Pap. Mich. Acad. Sc., Arts & Lett.* **32**: 126. 1946 (1948)) as had been expected by me. *Clitocybe cyanea* Rick is a synonym of that species.

Clitocybe gilvoides Rick, *Broteria* **24**: 101. 1930.

The type (no. 12892) from São Leopoldo, 1929, is in good condition. Spores slightly to distinctly rough, angular in polar view (7-10 reinforced longitudinal angles), not perfectly hyaline, rather straminеous, short ellipsoid, nonamyloid, 4-6.3 × 3.5-4.1 μ; basidia 25-26 × 5.5-7 μ; subhymenium ramose; hymenophoral trama subregular, hyphae without clamp connections. This differs from related species (from *Rhodocybe truncata* in subdistant lamellae and perhaps in taste, from *Rhodocybe rosciavellanea* in definitely smaller spores and some

macroscopical details) and appears to be a good species of Rhodocybe, viz. *Rhodocybe gilvoides* (Rick) Sing. comb. nov.

Clitocybe cinnamomeolamellata Rick, *Broteria* **24**: 100. 1930.

The type (no. 12950) from São Leopoldo, 1929, collected by Steffen, coincides in all microscopical characters with *Cantharellula coprophila* (Speg.) Sing., also described from Brazil but widely distributed in forested areas of South America where cattle grazes. Rick's species is a synonym of the latter, which was likewise indicated by Rick *l. c.* p. 101.

Clitocybe subnimbata Rick, *Lilloa* **2**: 259. 1938.

The two collections found at Porto Alegre, the type (no. 12896) and another specimen, no. 12910, the latter in excellent condition, both from São Leopoldo, and identical with each other. The authentic topotype material has evidently not been used for the original description and differs merely in being larger: Pileus now (dried) 35 mm broad; stipe 40 × 5 mm. The spores are remarkably irregular in shape, ellipsoid to ellipsoid-oblong, often with local reinforcements of the wall and therefore often rounded-angular when deflated or collapsing, often, even in good condition, showing a lateral swelling and at times distinctly rounded-pentagonal in polar view, hyaline, nonamyloid, 4.8-6.9 × 2.7-4.1 μ; cheilocystidia present, rather elongate, very irregular in shape and some forked or with nodules or protuberances; epicutis of the pileus consisting of hyphae which are extremely irregular in arrangement, size, shape and ornamentation, strongly interwoven in places and the terminal or projecting members often with short excrescencies, knoblike appendages, branchlets, etc. although not regularly diverticulate; hypodermium melleous, its hyphae somewhat swollen in places and forming a cutis; all hyphae with clamp connections, non-amyloid. The fungus has the habit of a Clitocybe or a Lactarius. There are no pseudocystida. The color of the spore print is unknown. With these data at hand, it should be possible to collect more fresh material in order to furnish data on the characters now missing, and in order to obtain more data on the shape of the spores which in these specimens is somewhat puzzling. At present, I feel that no transfer should be attempted although the chances are that this species belongs in Marasmiellus.

Clitocybe sublilacina Rick, *Lilloa* **2**: 259. 1938.

The type (no. 14056) was collected on forest humus at São Leopoldo 1934. The spores are hyaline, smooth, non-amyloid, 4.8 × 2.5 μ; the covering layer of the pileus consists of a trichodermium (not in palisade) of slightly thickwalled cylindric light brownish or subhyaline filaments with rounded tips; the hymenophoral trama is now irregular; there are no cystidia; the base of the stipe lacks a socle. All characters as well as the general appearance point at *Trogia cantharelloides,* redescribed by me in *Lloydia* **9**: 121. 1946, and already known to exist in Rio Grande do Sul (Serro Azul, Rick 402, Farlow Herbarium). The absence of a socle may be explained by the fact that the type specimen was gathered on the ground rather than on rotten wood.

Clitocybe nivea Rick, *Lilloa* **2**: 261. 1938.

The type (no. 12912) from São Leopoldo, 1933, consists of large carpophores that look much like *Leucopaxillus albissimus* or *L. rickii* at first glance. Spores ellipsoid, smooth, easily collapsing, thin-walled, but not extremely so, non-amyloid, 6.2-7.5 × 4.5-4.8 μ; basidia 4-spored; cystidia none seen; epicutis of the pileus with strongly nodose-ramified hyphae; all hyphae non-amyloid. This seems to be close to *Marasmiellus substenophyllus* (Murr.) Sing. which differs in narrower decurrent, distant lamellae.

Collybia rubra Rick, *Lilloa* **2**: 267. 1938.

There is no type specimen. This species, as described, seems to be very characteristic, and it should be possible to rediscover and redescribe it. There is a specimen under the name *Collybia rubra* Rick at the Farlow Herbarium, determined by Rick, but this has evidently nothing to do with the published binomial. It is *Calocybe rubra* Rick ex Sing.

Collybia excentrica Rick, *Broteria* **18**: 54. 1920.

The type has been lost. There is only one collection, no. 23137 from São Salvador, June 7, 1945 which does not seem to be the same plant. It might belong in Clitocybe where, even if it were identical with the type, it would become a homonym. It reminds one of *Clitocybe scandens* Sing. and *Clitocybe aberrantissima* Sing.

Collybia chordipes Rick, *Lilloa* **2**: 269. 1938.

The type has been lost. There is, however, a specimen collected 1932 at Parecí by Rick and determined *Collybia chordipes* by him (no. 12371), bnt this differs so considerably from the original account that I think it unbelievable that it has anyting to do with the fungus described *l. c.* The type grows on the earth, no. 12371 on dead wood; the stipe of the latter is even now longer than 3 cm and narrower than 4 mm, and was hardly brown when fresh but rather pallid or whitish; the pileus of no. 12371 is neither macro- nor microscopically velutinous. The label on the specimen says « terra » which coincides with the original description but not with the facts. It must be assumed that the label was misplaced and the specimen mixed up. The specimen itself is of uncertain position and should be restudied. The spores are smooth and non-amyloid, short ellipsoid (also different from what is indicated by Rick!), easily collapsing (although with moderately thin wall) and then seemingly wrinkled (but I think they are smooth in fresh condition!), even seemingly (?) nodose-angular at times, 4.2-5.3 × 3.5-4 μ; hymenophoral trama non-amyloid and non-gelatinized, regular, with slightly interwoven, filamentous hyphae with rather thin walls; subhymenium well developed; hymenium consisting of basidia and perhaps cheilocystidia; epicutis of the pileus formed by smooth or occasionally nodulose filamentous hyphae without incrusting pigment; all hyphae non-amyloid without clamp connections. The lamellae show distinct ladder-like venose anastomoses. The basal tomentum is whitish. Since this fungus is not identical with the type, it should be redescribed, as a new species, but in order to do so, one would need more data from better collections. *Collybia chordipes* Rick is a nomen dubium.

Collybia dubia Rick, *Lilloa* **2**: 269. 1938.

There are no specimens at Porto Alegre. This is a nomen dubium.

Collybia atramentosa « Kalchbr. » sensu Rick, *Lilloa* **2**: 270. 1938 and *Heliomyces verpoides* Rick, *Ann. Mycol.* **3**: 234. 1905. — See chapter II, p. 123.

Collybia sericea Rick, *Broteria* **17**: 104. 1919.

There is no type specimen. « Authentic » material preserved at Porto Alegre is not this species since the stipe is hardly glabrous;

other discrepancies make it likewise impossible to identify it (no. 12357, São Leopoldo, 1940) with the original diagnosis. Consequently *Collybia sericea* is a nomen dubium.

Collybia pluteoides Rick, *Lilloa* **2**: 271. 1938.

The specimen preserved is completely destroyed by insects. According to the description, this might be a Lepiota which has lost its annulus, or else a Callistosporium, or Hygrocybe.

Collybia viridis Rick, *Broteria* **18**: 54. 1920.

The type is in good condition, and shows the presence of small short-ellipsoid spores which are hyaline, smooth, non-amyloid; the hymenial elements are not very well preserved, but there are evidently no cystidia on the sides of the lamellae; the hypodermium and the colored portion of the stipe are now melleous and some hyphae in the stipe have rather thick walls; their outermost elements as well as the elements of the epicutis of the pileus are nodose; in the pileus there are also strongly diverticulate and hyaline hyphae while the cutis formed by the hypodermial hyphae is much deeper colored; all hyphae with clamp connections and non-amyloid. A fungus, collybioid in aspect, and characterized by green colors when fresh (not in the herbarium!) should be difficult to confuse. Spegazzini described a green Omphalia, *O. cupreovirens* Speg. This species has slightly smaller but otherwise identical spores, and it may be safely assumed, I suppose, that the structure of the surface layers which could not be established on the basis of Spegazzini's type material, is the same as in *Collybia viridis*. Consequently, *Collybia viridis* Rick appears to be a synonym of *Omphalia cupreovirens* Speg. which, however, should be transferred to Marasmiellus as *Marasmiellus cupreovirens* (Speg.) Sing. because of the structure of the epicutis and the non-amyloid hyphae. *M. cupreovirens* was first described from Apiaí, State of São Paulo, Brazil.

Collybia bianastomosans Rick, *Lilloa* **2**: 273. 1938.

There are no type specimens. This is a nomen dubium.

Collybia lepiotoides Rick, *Lilloa* **2**: 273. 1938.

There are no type specimens. Unless it can be rediscovered and redescribed (because of its characteristic features), it remains doubtful.

Collybia pygmaea Rick, *Broteria* **24**: 104. 1930.

The type of this species is in good condition. Spores smooth, hyaline, ellipsoid, non-amyloid, 5.7-8 × 3-4 μ; basidia clavate; basidioles fusiform; subhymenium broad and distinct; hymenophoral trama regular, with somewhat interwoven densely arranged elements, hyaline or subhyaline; epicutis of the pileus with distinct «Ramealesstructure», consisting of repent hyphae with nodose erect outgrowths and short ramifications, etc., colorless, but ocher brown to melleous in the hypodermium where the filamentous hyphae are not incrusted by pigment, and form a cutis; there is also a distinct «Ramealesstructure» on the surface of the stipe, but the dense erect hairs covering the stipe of *Marasmiellus subramealis* are absent. All hyphae have clamp connections and are non-amyloid. This species is evidently closely related and congeneric with *Marasmiellus subramealis* Sing. from Tucumán but differs in the shape of the pileus and the covering of the stipe. The combination *Marasmiellus pygmaeus* (Rick) Sing. is proposed.

Collybia sulcatissima Rick, *Lilloa* **2**: 275. 1938.

The type (no. 12372) comes from São Leopoldo and grew on earth. It is in rather bad condition, and many data absolutely necessary to dispose of this species cannot be obtained from the material at hand. The pileus is only a fragment, badly pressed and moulded. The stipe shows at its base something that might be the remainder of a volva. The spores are subglobose to very short ellipsoid, non-amyloid, numerous, 9.5 × 7.5-85 μ; cystidia none found; hymenophoral trama seems to be irregular now; epicutis — a cutis, but in such a state of collapse, it cannot be interpreted correctly. There are also too many foreign bodies on it. Clamp connections were not seen with certainty, but all hyphae are definitely non-amyloid. These data are insufficient but it may be that this is the same species as described by Rick as *Amanitopsis plumbea* Rick.

Mycena subtenerrima Rick, *Broteria* **24**: 100. 1930.

The type (no. 14273), collected by Rick in 1930, has smooth, amyloid spores variable in size, e. gr. 7.5 × 4.7 μ; and amyloid trama. At the base of the stipe is a distinct and broad disc. This is a true *Mycena* of the section *Basipedes* (Fr.) Kühner.

Mycena luteopurpurea Rick, *Lilloa* **2**: 281. 1938.

No specimens in existence — a nomen dubium.

Mycena violaceogrisea Rick, *Lilloa* **2**: 281. 1938.

The type (no. 14252) from São Leopoldo, collected by Rick 1930, looks much like a Lepiota. The structure of the epicutis is difficult to observe, and consists mainly of now collapsed cells; the spores are ellipsoid, broadened below, with strongly eccentric hilar appendage, smooth, with homogeneous wall, small and moderately thin-walled, numerous, definitely non-amyloid (not pseudoamyloid!), 3-3.5 (4) × 2 (3) μ. These data would place the species in the genus *Cystolepiota* separated from *Lepiota* (*Lilloa* **25**: 281 (1951) 1952) yet no transfer is proposed because of the uncertain data on the epicutis.

Mycena decipiens Rick, *Broteria* **24**: 100. 1930.

The specimens in existence are in extremely bad shape. They consist merely of stipes and substratum, one stipe still clinging to a half-destroyed fragment of a pileus. One depends, therefore, entirely on the diagnosis which indicates rather striking features which would place the species either in Mycena or in Poromycena (if the latter genus is considered generalically different from the former). In Poromycena it would be a homonym.

Mycena rhodopus Rick, *Broteria* **24**: 99. 1930.

There are no specimens in existence. If the bright characteristic colors indicated by Rick make it possible to re-collect this species, it might be redescribed. Otherwise it is undeterminable.

Mycena viridiflava Rick, *Lilloa* **2**: 282. 1938.

The type (no. 14259) from São Leopoldo 1932 has pseudoamyloid spores with spur. This is undoubtedly a *Lepiota* spec.

Mycena sulphureoconspersa Rick, *Broteria* **17**: 105. 1919.

There are no specimens. The description is insufficient. The species is a nomen dubium.

Mycena subpumila Rick, *Lilloa* **2**: 283. 1938.

There are no specimens under this name. However, under the name of *Mycena pumila,* specimens were discovered which evidently belong here (no. 14228); they come from São Leopoldo, 1930. The spores are subglobose to ellipsoid, smooth, with comparatively thick walls, 4.3-4.5 × 2.8-3.2 μ. Basidia small and 4-spored; hymenophoral trama consisting of subinterlaced hyphae which seem to run in bunches of parallel or subparallel narrow filaments and make the trama subregular-subirregular; cystidia and cheilocystidia not seen; epicutis of the pileus consisting of hyphae and erect bodies which distinctly lacerate-rough; epicutis of the stipe consisting of hyphae which are diverticulate with small erect cystidioid bodies and very strongly lacerate; all hyphae non-amyloid, with clamp connections. According to these data, this species is a Marasmiellus for which we propose the combination *Marasmiellus subpumilus* (Rick) Sing.

Mycena longispora Rick, *Lilloa* **2**: 286. 1938.

There are no specimens in existence. For the present at least, this must be considered a nomen dubium. Var. *brasiliensis* Rick (*l. c.* p. 286) refers to *Mycena alcalina* rather than to *M. longispora* and is evidently a true Mycena.

Mycena humilis Rick.

What seems to be the type (no. 14227) is very much like the large Mycena with acute umbo and chlorine odor, quite common in South America, but differs, according to Rick's description, by olive pileus. The spores are smooth and amyloid.

Omphalia viridilutea Rick, *Lilloa* **2**: 291. 1938.

No types are preserved. However, there are two authentic collections, one of them (no. 12049, January 16, 1944) is copiously represented, growing on rotten wood, and now in moderately good condition. The spores are ellipsoid, smooth, hyaline, non-amyloid, 6.8-8.3 × 4-4.8 μ; basidia clavate, 4-spored, 28-32 × 7.5-8.2 μ; basidioles fusiform; cheilocystidia not distinguishable with certainty, perhaps with diverticulate elements on the edge; epicutis of the pileus — a distinct Rameales-epicutis, i. e. with various protuberances

and short ramifications, the lower layer of the epicutis consisting of smooth, hyaline to brownish hyphae forming a cutis; above the epicutis there are fragments of castaneous-succineous (membrana-pigment) hyphae which probably correspond to similar ones on the surface of the stipe, and represent the squamules and red punctations mentioned by Rick; hypodermium consisting of filamentous hyphae which are often thicker than those of the epicutis with rusty to chestnut colored incrusting pigment (but the latter dissolving in hot KOH, 10 %, at least partially); all hyphae (except those of the stipe) thin-walled, everywhere non amyloid, clamp connections present; hyphae of the stipe longitudinally arranged and parallel with moderately thin walls, with colored hyphae forming a similar fragmentary outermost layer as those on top of the epicutis of the pileus, but here often taking the shape of dermatocystidia. There is a colored basal tomentum. In view of the characters indicated above, the transfer to Marasmiellus becomes necessary but is not proposed here because Rick's species appears to be extremely close to *Marasmius viridifuscus* Berk. & Curt. No microanalysis was possible of the latter, and the final decision is left to further studies on the Marasmii of the Kew Herbarium.

Omphalia irregularis Rick, *Lilloa* **2**: 292. 1938, and *Omphalia tricolor* Rick, *Broteria* **24**: 102. 1930.

The types of these species (no. 14056 and no. 14072 respectively) are identical with each other. They show the following characters: Spores 5-7.5 × 3.5-4.2 μ, mostly 6.2-6.5 × 3.5-3.7 μ, non-amyloid, guttulate, smooth, hyaline, ellipsoid; basidia 19-20 × 5.2-5.5 μ; cystidia scattered, indistinct, clavate basidiomorphous (?); cheilocystidia and epicuticular elements both distinctly ramified or broom-like, with some nodules diverticulate here and there, with knob-like excrescencies, etc., much like in many Rameales (section of Marasmiellus); hymenophoral trama regular (neither irregular nor of the Clitocybe type), not gelatinized, consisting of filamentous elements which are slightly interwoven and sparsely septate; trama of the pileus extremely irregular, consisting of hyphae of different size and type, running in all directions, not gelatinized; surface elements of the apex of the stipe diverticulate but no striking dermatocystidia seen; base of stipe subinsititious, i. e. without strigosity or mycelial fibers but with a hyphal mat on the substratum surrounding the

base of the stipe; all hyphae non-amyloid, with clamp connections. According to these characters, this species is a Marasmiellus and the combination *Marasmiellus irregularis* (Rick) Sing. comb. nov. is proposed (because the older *Omphalia tricolor* Rick is a homonym).

Omphalia tricolor Rick, see preceding species.

Omphalia unicolor Rick, *Lilloa* **2**: 292. 1938.

There are no types. A nomen dubium.

Omphalia nigroconspersa Rick, *Broteria* **24**: 102. 1930.

The type (no. 14070) from São Leopoldo 1929, collected by Steffen, determined by Rick, is in bad condition. The specimen is evidently sterile. It can only be stated that there are no cystidia in the remainders of the hymenophore, and no incrusting pigments in the cuticular layers (but there is a fuscous intracellular pigment in the hyphae making up the black particles mentioned in Rick's diagnosis). The fragment is badly moulded but some hyphae with clamp connections were observed. There is only one carpophore. This might be a Clitocybe, but with the scanty evidence at hand, no transfer is proposed, and *O. nigroconspersa* is a nomen dubium unless re-collected.

Omphalia noctilucens Rick, *Broteria* **24**: 103. 1930.

There are no specimens. A nomen dubium unless rediscovered.

Omphalia basirosea Rick, *Broteria* **24**: 101. 1930.

The type (no. 14051) was collected on frondose wood in São Leopoldo, 1929, by Steffen, and determined by Rick. It consists of two carpophores. The spores are very few (in spite of numerous basidia with sterigmata) and only a few were seen which belong to this collection inasmuch as they are reasonably like the ones described by Rick: hyaline, smooth, oblong, non-amyloid, 7.5 × 4 μ; basidia 22 × 6.2 μ, clavate, 4-spored; cystidia none seen; hymenophoral trama decidedly regular with the outermost portion slightly diverging and there with thin hyphae with thin walls (Clitocybe-type of regular trama); epicutis of the pileus hyaline, consisting of thin, filamentous hyphae which are densely arranged and repent; hypodermium with some less filamentous elements, brown, more interwoven, without incrusting pigment; all hyphae non-amyloid, with clamp

connections. According to these characters this species belongs to Clitocybe. The characteristic pink base should be sufficient evidence that this is an independent species, characterized, moreover by medium size (larger than the closely related *Clitocybe aprilis* Sing.) and moderately close to subclose (less close than in *C. aprilis*) lamellae. The combination *Clitocybe basirosea* (Rick) Sing. comb. nov. is proposed.

Omphalia elastica Rick, *Lilloa* **2**: 295. 1938.

No type material has been discovered. According to the description, this may be the same as *Gerronema elasticum* Sing.

Omphalia byssiseda Bres. in Rick, *Fungi Austro-Americani* fasc. 1. — *Ann. Myc.* 406-410. 1904. — See Chapter II, under *Marasmiellus byssisedus* (Bres. in Rick) Sing.

Omphalia condiscipula « Berk. » sensu Rick, *Lilloa* **2**: 297. 1938.

Material preserved at the Farlow Herbarium by Rick seems to be identical with other material distributed by him and with material preserved at Porto Alegre. It is a species of the difficult *Mycena euspeirea* complex.

Pleurotus anastomosans Rick, *Broteria* **24**: 116. 1930.

There is no material preserved.

Pleurotus cornucopioides « Pers. » sensu Rick.

Material of this (under the name of *Pleurotus sapidus* Kalchbr.), collected and determined by Rick, December 1945 is the same as *Pleurotus* spec., mentioned and keyed out by me in *Lilloa* **22**: 271-272. 1949 (1951). A complete and original macroscopical description is still missing.

Pleurotus magnificus Rick, *Broteria* **5**: 22. 1905; cf. *Broteria* **10**: 13. Plate 3. 1912.

No specimens were seen at Porto Alegre. However, there may be specimens in some other herbarium. Besides, the species should be easy to recognize. It is probably closely related to *Pleurotus rickii*

Bres. but differs in larger size and striate margin, gray squamules and a tendency to become yellow. It may be too close to *Pleurotus dryinus*.

Russula subfragilis Rick, *Lilloa* **2**: 302. 1938, non Hennings in Warburg, *Monsunia* **1**: 149. 1900, nec Romell, *Arkiv. f. Botan.* **11** (3): 6. 1912.

The type (no. 14927) is in moderately good condition. It comes from Porto Alegre, 1930, and consists of a single carpophore. It is sufficiently well preserved in order to yield a combination of characters not otherwise represented in the genus Russula. The spores are hyaline or subhyaline, 8.3-9 × 7-7.5 µ, their ornamentation projecting 1-1.6 µ, of type II (III*b*), i. e. crested; macrocystidia of the hymenium of the lamellae versiform, mostly clavate, with banded to banded-amorphous or banded-granular contents, bluish in cresyl blue mounts but not more so than the basidia and not metachromatic, rather numerous, 45-50 × 6.2-8.2 µ; dermatopseudocystidia in the cuticle of the pileus present but scattered and filled with granular contents, ventricose-fusoid with rounded tips, imbedded among ordinary hyphae. The surfaces are unfortunately so much decayed under the influence of bacteria, and also covered with dirt, that it is impossible to make an adequate anatomical study. There are large spherocysts in the trama, including that of the hymenophore, but there are also abundant connective hyphae around them. The margin of the pileus is subacute to acute. Lamellulae are present, but their number and arrangement is now difficult to judge. The new name *Russula riograndensis* Sing. nom. nov. is proposed.

Russula theissenii Rick, *Broteria* **6**: 74. 1907, cf. *Broteria* **10**: 13, plate 4, fig. 1, 1912.

The type (n° 14926) from São Leopoldo, 1907, consists of five carpophores, all obviously identical with each other, and in good condition. Spores hyaline (NH_4OH), subglobose to (rarely) ellipsoid (e. gr. 9.5 × 6.5 µ), strongly axillarly asymmetrical, 8.8-10.3 × 6.5-9 µ, their ornamentation projecting 0.4-0.8 µ, of type III*a*, in fewer cases III*b* (i. e. warty with thin connecting lines forming a complete or incomplete network), few with short ridges (II-IV), or catenulations (VIII); basidia clavate to ventricose, with (2-3-) 4 sterigmata, 40-51 × 10.2-13.7 µ; cystidia of the gloeocystidial type (in cresyl blue

mounts not homogeneously but often in parts deep blue, and always standing out deeper blue on the background of hyphae and basidia, often directly connected with gloeo-vessels), obliquely ascending into the hymenium, their apices not always reaching the level of the sterigmata, clavate or ventricose, in the latter case thebroadest portion in the upper half, more rarely cylindrical, with banded contents, rather numerous, 48-57 × 8.2-11.7 μ; epicutis of the pileus consisting of broadened elements which form a coarse epithelium (but no Virescens-structure !), hyaline and somewhat opalescent, without colorable contents, smooth ; underneath, there is a layer of cylindric to filamentous hyphae which form a gelatinized cutis ; underneath this loosely arranged cutis, there is a nongelatinized cutis of hyphae more densely arranged; numerous gloeo-vessels and oleiferous hyphae present in the trama ; on the margin of the pileus, the only protuberances visible are bunches of projecting hyaline hyphae. It must be assumed that the « barbed » margin mentioned by Rick is due to these hyphae. All hyphae without clamp connections and non-amyloid. The surface of the pileus appears completely glabrous in the type specimens, the barbed zone is not visible now. The margin is acute ; the lamellae are narrow and close, more or less intermixed (the extent of occurrence of lamellulae and their arrangement is difficult to judge in the specimens available, the lamellae are said to be pentadymous according to Rick) ; there is a short sulcation in the marginal zone, and the margin may have been short-pectinate when fresh. These data agree with those gathered from somewhat less well prepared authentic material preserved at the Farlow Herbarium (see *Mycologia* **34** : 68. 1942). The position of this species is still not fully cleared up although the known characters are now very complete. The specimens give the strong impression of belonging to the *Ingratae,* and since this impression is not born out by the descriptive data at hand, one is tempted to consider this species as intermediate between Ingratae and, among temperate groups, perhaps Elephantinae. However, in view of the structure of the epicutis of the pileus, now known, this solution does not seem to be very satisfactory. There is, however, a strong possibility that *Russula theissenii* Rick belongs in the same group as *Russula decaryi* Heim from Madagascar. As we have seen in earlier publications on tropical American Russulae, the neotropical species seem to frequently duplicate the African ones although they differ in details on the specific level. Heim says that there are « cellules terminales globuleuses » in his *Russula decaryi*

and if the barbed-fibrillose margin would indicate pseudoangiocarpous development of the primordia, one might prefer to insert Rick's species in the section *Pellicullariae* Heim. Further studies on fresh material would be important in order to determine the development of the carpophores, the chemical reactions, the exact color of the spore print and the aldehyde-acid reactions of the pseudocystidia. The apparent similarity with the Foetentinae is perhaps entirely due to habit and color of the dried material which is deceptive since, according to the original diagnosis, the colors inside as well as outside, are remarkably bright and would fit well into the subsection *Heliochrominae* Heim (where *Russula decaryi* belongs). In one of the specimens we find a radicant stipe such as described and illustrated by Heim for *R. radicans* Heim, but this character does not seem to be constant.

Russula pectinata « (Bull.) Fr. » sensu Rick.

As has been shown in a previous paper *(Pap. Mich. Acad. Sc. Arts & Lett.* **32** : 108. 1946 (1948) Rick's idea of *Russula pectinata* coincides with a species of the Pellicullariae rather than with a representative of the *Ingratae.* Further type studies (*Lilloa* **23** : 239. 1951) have shown that this (wrong) interpretation of Fries's species by Rick coincides with what Spegazzini called *Clitocybe puiggarii* Speg., also described from Brazil, and which actually belongs in *Russula,* section *Pellicullariae.* It was then transferred to Russula as *Russula puiggarii* (Speg.) Sing. This species occurs in Northern South America north to Trinidad.

Lactarius aductus Rick, *Lilloa* **2** : 304. 1938.

There are no specimens preserved. The description seems to suggest a species close to *Lactarius necator.*

Lactarius russula Rick, *Broteria* **5** : 20. 1906, cf. *Broteria* **6**. Plate 9, fig. 2, 5. 1907.

Material preserved at the Farlow Herbarium (Rick, *Fungi Austro-Americani* n°. 148, from São Leopoldo, 1906) shows a cuticle of the pileus consisting of a dense palisade of very thick-walled hairs rising from swollen elements (spherocysts) ; their tips are obtuse, their walls hyaline, and some do not rise immediately from a spherocyst

while some of the spherocysts do not bear a hair but merely a mucronate tip; the spores are about 8.5-10.5 × 6.5-8.3 μ, subglobose to subellipsoid, asymmetrical, with ornamentation projecting 0.3-0.8 μ and showing a design corresponding to type VI-VIII (catenulated but isolated warts), IV (warts with very few thin connections), III*b* (incomplete network). In many ways, this species reminds one of another tropical Lactarius, *Lactarius rubroviolascens* Heim from Madagascar.

Lactarius steffenii Rick, *Broteria* **24**: 117. 1930.

There are no specimens in existence. It reminds one somewhat of *Lactarius allochrous* Sing., Sydowia **2**: 41. 1948 but differs in watery latex.

Lactarius braunii Rick, *Broteria* **24**: 118. 1930.

The type specimen of this species (no. 13751) was collected by Braun at Porto Alegre and is in fairly good condition. At first sight one would be inclined to identify it unconditionally with *Lactarius hygrophoroides* or *Russula dennisii*. The latter alternative is excluded by the fact that Rick actually described the latex as white and also by the anatomical data gathered from the specimen, especially because of the different structure of the hymenophoral trama. The latter is without spherocysts and very irregular, consisting of hyphal elements of all sizes and shapes, intermixed with numerous typical broad laticiferous vessels. Spores 7-8.2 × 5.5-7 μ, their ornamentation projecting 0.2-0.5 μ, of type III (III*a*-III*b*), i. e. warty-reticulated, some spores with short ridges (II-IV) and catenulations (VIII); basidia 4-spored, about 55 × 7 μ; cystidia none seen except for inconspicuous cystidia at the edge of the lamellae, much like those of *L. hygrophoroides*, and some laticifers (broad: 8-8.3 μ in diameter) entering occasionally the hymenial layer; epicutis of the pileus formed by slightly thick-walled, yellow hyphae forming a trichodermium; these hyphae are smooth, filamentous, with rounded tips and 2.5-4.5 μ diameter; all hyphae without clamp connections. As these data show, it is not so much the anatomical analysis as Rick's original description that make one think that *Lactarius braunii* might be different from *Lactarius hygrophoroides*. The pileus is said to be citrinous with red dots, the stipe is described as white! There is naturally also the question of mycorrhizal relationships. *Lactarius*

hygrophoroides occurs constantly with representatives of the order *Fagales*, mainly Quercus while such trees do not exist in the forests of Rio Grande do Sul. It is true that the type comes from Porto Alegre, where many foreign trees have been planted in private gardens as well, as in parks, but there are two more collections of *Lactarius braunii*, both authentic and certainly conspecific with the type (no. 13750 and no. 13754, collected in 1931 and 1932 respectively) but from São Leopoldo where the possibility of having been collected in connection with introduced Fagales is smaller. Further observation of fresh specimens with color indication in terms of a color chart, with indication of the chemical reactions important in this group (section *Dulces*), viz. $FeSO_4$, KOH, NH_3, monomethylparamidophenol, phenol and anilin-oil and with a careful observation of the accompanying trees, will eventually clarify the differences existing between *Lactarius braunii* and *L. hygrophoroides*. It should also be taken into consideration that *Lactarius hygrophoroides* and another species, identical with *Lactarius braunii* may both occur in Rio Grande do Sul since Rick also indicates *Lactarius distans* Peck which is a synonym of *Lactarius hygrophoroides*.

Hygrophorus lugubris Rick, *Lilloa* **2**: 306. 1938, **H. subpsyttacinus** Rick, *l. c.*, and **Hygrophorus plumbeus** Rick, *l. c.* p. 307.

Rick's new species of *Hygrophorus* are not preserved, and must be considered as nomina dubia.

Lentinus velutinus Fr. sensu Rick.

Rick's specimens are all correctly determined and belong to what is now called *Panus siparius* (Berk. & Curt.) Sing.

Lentinus subglaber Lloyd sensu Rick

Material collected at São Leopoldo in 1934 and marked «(non typus)» is deposited under no. 13848. This is not, as expected, a *Pleurotus* spec. but *Panus rudis* var. *semirudis* (Sing.) Sing. It would be interesting to study Lloyd's type in the Lloyd Herbarium.

Lentinus tener « Klotzsch » sensu Rick.

Material determined by Rick corresponds to what is usually determined *Lentinus tener*, or *Lentinus crinitus*, the correct name being *Panus crinitus* (L. ex Fr.) Sing.

Lentinus pilosus Rick, *Lilloa* **2**: 310. 1938.

The type is deposited under *Lentinus pilosissimus* Rick no. 13845, São Leopoldo 1936, collected by Rick. At first glance, this looks like a Crinipellis, but, as the following analysis will show, it is not: Spores broadly ellipsoid, smooth, non-amyloid, about 10.2 × 6.9 μ; basidia about 40 μ long and 7 or more μ broad; cystidia opalescent, hyaline, on the sides and edges of the lamellae, thick-walled, with the wall at least 2 μ thick, smooth or somewhat hyaline-incrusted, ampullaceous-ventricose, reminiscent of those of Inocybe, or compressed and this shortened and broadened above, 37-83 × 17-24 μ, with rounded tips; epicutis of the pileus formed by elements with a structure much like that of *Boletus edulis* Bull. ex Fr. (see *The Amer. Midl. Natur.* **37**: 25. 1947), the horizontal chains of short hyphal elements broadened even more near the surface and interwoven with a general tendency to form spherocyst-like terminal members, the latter ascendant or erect, either subglobose or claviform-vesiculose, brown, smooth, not forming a true hymeniform layer nor a multistratous epithelium, but often giving the impression of a monostratous epithelium but the outermost layer interrupted at intervals, by long (300-450 μ) thick-walled hairs which are non-septate and without ladder-structure, nonamyloid (not pseudoamyloid), melleous to castaneous-succineous, gradually tapering and becoming lighter colored to the needle-sharp acute tip, usually more pigmented in the inner layers of the complex wall, with a hyaline inner tube showing where the hair has been broken off, more rigid than in Crinipellis, 13.4-20 μ broad (i. e. broader than in Crinipellis), the walls 2.7-7 μ thick, rarely entirely subhyaline; context consisting of hyaline hyphae with clamp connections, non-amyloid. This is neither a Crinipellis nor a Lentinus, but a Xerula, closely related to *Xerula pudens* (Pers. ex S. F. Gray) Sing. = *Collybia longipes* (Bull. ex Fr.) Quél. The combination *Xerula pilosa* (Rick) Sing. comb. nov. is proposed.

Lentinus anastomosans Rick, *Lilloa* **2**: 310.1938.

The type must have been lost. There is authentic material, collected and determined by Rick at Estação São Salvador, April 23, 1944, no. 22567 which is identical with *Lentinellus angustifolius* (Romell) Sing. It has very crowded, very narrow lamellae and strongly amyloid very small spores. The original diagnosis does not show any appreciable discrepancies. Therefore I consider *Lentinus anastomosans* Rick as a synonym of *Lentinellus angustifolius* (Romell) Sing.

Lentinus cucul(l)atus Bres. in Rick, *Lilloa* **2**: 310. 1938.

There is no material. It is possible that there is material at the Riksmuseet in Stockholm which I have overlooked. If not, this is a nomen dubium.

Schizophyllum album Rick, *Broteria* **17**: 111. 1919.

There are no specimens because Rick himself identified his own species later on with *Schizophyllum commune*, and evidently correctly so. *Schizophyllum commune* is common in the State of Rio Grande do Sul, and rather variable within the descriptions of *S. commune* and *S. radiatum* (the latter a form of the former occurring only in hot countries and green-houses).

Phyllotremella steffenii Rick, *Lilloa* **2**: 313.1938.

There are no specimens. This is a nomen dubium.

Catharellus virgineus (Rick) Rick, *Lilloa* **2**: 314. 1938 and *Xerotus virgineus* Rick, *Broteria* **24**: 118. 1930.

The type specimen was not found.

Xerotus virgineus Rick, see *Cantharellus virgineus* (Rick) Rick.

Heliomyces viridans Rick, *Egatea* **11**: 17. 1926.

Heliomyces verpoides Rick, see chapter II under *Hydropus riograndensis* Sing.

Pholiota pusilla Rick, *Broteria* **17**: 108. 1919.

No specimens in existence. A nomen nudum.

Pholiota rosea Rick, *Broteria* **17**: 108. 1919.

No specimens in existence. A nomen dubium.

Pholiota olivaceocoriacea Rick, *Broteria* **24**: 109. 1930.

The type from Cruz Alta seems to have been lost. There is a specimen (no. 14631) collected by Rick in 1933 at São Leopoldo on

the ground. This has melleous spores, 7 × 4 μ, and chrysocystidia. It looks much like *Pholiota polychroa* (Berk.) Smith & Brodie.

Pholiota strophariodes Rick, *Broteria* **24**: 110. 1930.

Both the type (no. 14634, from Porto Novo, 1930) and.a collection named var. *maior* (no. 20943) belong in the family *Agaricaceae* in the strict sense. The type itself is evidently an *Agaricus* spec. The authentic material is perhaps a *Lepiota* sensu lato.

Pholiota vermiflua var. **perfecta** Rick, *Lilloa* **3**: 402. 1938 = **Pholiota platensis** var. **perfecta** Rick, *Broteria* **6**: 78. 1907, cf. l. c. pl. 5.

The original photograph proves that this is a species of Agrocybe, rather common in Southern South America, which is redescribed as *Agrocybe perfecta* (Rick) Sing. comb. nov. in Singer & Digilio *Lilloa* **23**: 323 (1951) 1952.

Pholiota testacea Rick, *Lilloa* **3**: 402. 1938.

The type (no. 14968) is preserved under the name *Pholiotella testacea*. It is a small *Agaricus* spec., but the binomial *Agaricus testaceus* is preoccupied.

Pholiota arragonis Rick, *Broteria* **24**: 109. 1930.

The type (no. 9181) is very difficult to analyse. The hyaline elements of the outermost layer of the cuticle of the pileus are badly eroded and broken down, and besides, invaded by numerous moulds. The cheilocystidia have collapsed or have mostly disappeared because the edge is not intact. No pleurocystidia have been found. The spores are melleous-ferruginous, ellipsoid, deep ferruginous in KOH, moderately well colored in NH_4OH, smooth, with thick double wall, with distinct truncate germ pore, 8.3-11 × 5-6.7 μ; hymenophoral trama regular, consisting of filamentous hyphae. This is certainly not a species of Pholiota in the present delimitation. It might be a Pholiotina, or, for that matter, almost anything within those groups that have smooth colored spores with germ pore. If there is a chance to discover more and better material of this on dung at Cruz Alta (type locality), it might be possible to clarify this species. It not, I am afraid it would become a nomen dubium.

Pholiota orinocensis Pat. sensu Rick, *Lilloa* **3**: 406. 1938.

What Rick consistently determined as *Pholiota orinocensis* Pat. is without any doubt precisely identical with what we determine as *Gymnopilus peliolepis* (Speg.) Sing., a species rather common in tropical and subtropical South America. This statement is also born out by the fact that the same species was collected frequently during my stay in Rio Grande do Sul. Considering the large geographic area of this species (Florida, U. S. A. to Argentina) it is certainly reasonable to admit the possibility that this same species also occurs in the Orinoco Region. Nevertheless, without having restudied the type, I am not ready to assume that Patouillard has overlooked the roughness of the spores, and described the context of the carpophores as vinaceous (which it never is). Furthermore, Patouillard's species grew in savannah vegetation among chips and débris of an abandoned fireplace, and the scales of the pileus are described as « apprimés » which is in contrast to Rick's own indications as well as mine. The pilei of our Rio Grande material have all squarrulose pilei. For all these reasons, I consider *Pholiota orinocensis* Pat. as different from *Gymnopilus peliolepis* (Speg.) Sing. (incl. *Pholiota orinocensis* sensu Rick), at least unless there is evidence to the contrary. See also chapter II under *Gymnopilus peliolepis*.

Pholiota carneola Rick, *Broteria* **24**: 108. 1930.

The type (no. 14635) from São Leopoldo, collected by Rick, is in good condition. The spores are reniform, smooth, melleous, some without any trace of a germ pore, others with an extremely indistinct germ pore but all non-truncate, 6-6.8 (7.5) × 4-4.2 (4.5) μ; basidia clavate, 4-spored, about 27.5 × 6-7.2 μ; cheilocystidia numerous, long, but difficult to describe since they have more or less collapsed, chrysocystidia numerous, clavate to clavate-mucronate, with a pale yellowish internal amorphous body (NH_4OH), about 31-34 × 8.8-12.5 μ; epicutis of the pileus hyaline, consisting of hyphae which are rather loosely arranged, hyaline, filamentous, repent; hypodermium somewhat irregular, consisting of broad and narrow golden yellow hyphae; all preparations of the hymenophore lemon yellow from a soluble (NH_4OH) intercellular (?) pigment; all hyphae with clamp connections. There are white rhizomorphs at the base of the stipe, but they are not distinct in the specimen. These data combined with

the description given by Rick prove that this is the same as *Pholiota apiahyna* Speg., described from Apiaí, state of São Paulo, Brazil.

Pholiota fragilissima Rick, *Egatea* 11 : 16. 1926.

No specimens found. A nomen dubium.

Pholiota brunneoatra Rick, *Broteria* 24 : 109. 1930 = *Pholiotella brunneoatra* (Rick) Rick, *Lilloa* 3 : 409. 1938.

The type (no. 14630) is an *Agaricus* spec.

Pholiotella brunneoatra (Rick) Rick, see *Pholiota brunneoatra* Rick

Pholiotella membranacea Rick, *Lilloa* 3 : 409. 1938.

The type (no. 14960) is an *Agaricus* spec.

Pholiotella atroumbonata Rick, *Lilloa* 3 : 409. 1938.

The authentic material preserved at Porto Alegre under no. 14964, from São Leopoldo, 1940, determined by Rick, is *Agaricus* spec.

Pholiotella fibrosa Rick, *Lilloa* 3 : 410, 1938.

The type (no. 14958) and authentic material from the same locality (no. 14961) are identical with each other. They belong to Agaricus. It is remarkable how consistently Rick interpreted the Spegazzinian genus *Pholiotella* in the sense of *Agaricus* (= Psalliota). It is true that the spores of many species of Agaricus are not purple as indicated in the classical litterature, but rather sepia to brown, and Spegazzini himself described his new genus in a manner as to suggest Rick's interpretation, yet his type species belongs, surprisingly enough, to *Psilocybe !* At the present state of our knowledge of the South American species of *Agaricus,* I have not seen fit to try a specific determination of Rick's Pholiotellas, but future type studies on Agaricus must include the five Pholiotellas from Brazil.

Pluteolus setosus Rick, *Lilloa* 3 : 410. 1938.

No specimens are in existence. A nomen dubium.

Pluteolus conicorubellus Rick, *Broteria* 18 : 54. 1920.

There is no type specimen. I do not know whether a specimen (no. 12233) under the name of *Annularia conicorubella* Rick from São Leopoldo, 1932, collected and determined by Rick, actually refers to this species. If so, it would be authentic material. This species belongs to one of the dark-spored genera of Agaricales ; I have not analized it any further since its status is quite doubtful.

Naucoria rugulosa Rick, *Broteria* 18 : 59. 1920.

There are no specimens in existence. This is nomen dubium.

Naucoria alba Rick, *Broteria* 24 : 111. 1930.

The type was collected by Steffen in 1929. It is not a Naucoria but rather a *Psathyrella* spec.

Naucoria albofimbriata Rick, *Broteria* 24 : 110.

What appears to be the type (no. 14128) was collected at São Leopoldo (no year !) and is undoubtedly a *Deconica* spec. The spores are smooth and only slightly although distinctly lentiform, not rhomboid and not triangular in outline, melleous in NH_4OH, olive melleous with a ferruginous tinge in KOH, with very thick, compound wall and broad truncate germ pore, 6.8-7.5 × 4.2-4.8 µ, if turned around its axis by 90° (in frontal view) they are 4.8-5.3 µ broad. The basidia are 4-spored ; cystidia none seen ; cheilocystidia in poor condition, apparently ventricose with subacute apiculus. This was collected on sandy soil. With so many species of *Deconica* described in various genera from the tropics, I hesitate to transfer this species to *Deconica,* but if not identical with any species described earlier, it should be transferred.

Galera grisea Rick, *Broteria* 18 : 60. 1920.

The only collection seen is filed under no. 21005 as « *Galera grisea* videtur ». It was collected at São Salvador, February 23, 1944, by Rick and determined by him as above. This is probably not identical with the type collection — apparently lost — nor is it a « Galera ». It is some dark-spored agaric.

Galera annula Rick, *Lilloa* 3 : 418. 1938.

No specimens have been found. A nomen dubium.

Galera griseobrunnea Rick, *Lilloa* 3 : 418. 1938.

There is a collection (no. 13474) under the name of « *Galera brunneogrisea* » which apparently belongs here. It is a *Psathyrella* spec., or perhaps some other dark-spored agaric.

Galera procera Rick, *Lilloa* 3 : 419. 1938.

There are two collections (no. 13478 and no. 23175, the former the type). They are probably not identical with each other. The type from Marcelino Ramos, 1936, collected by Rick, has indeed spores of 20 µ length, but these can be obtained only from dust fallen onto the stipe since there is no pileus left. Under these circumstances, the species becomes a nomen dubium. The « authentic » material has spores about 16 µ long and was collected at São Salvador, February 26, 1945. The specimen is pressed and badly broken.

Tubaria substagnina Rick, *Broteria* 18; 60. 1920.

There are no specimens in existence. This is a nomen dubium.

Tubaria crobula « Fr. » sensu Rick, *Lilloa* 3 : 421. 1938.

At least one collection named so by Rick turned out to be *Neopaxillus echinospermus* (Speg.) Sing. It comes from Couto, 1936 and is preserved at the Farlow Herbarium, now type of *Neopaxillus echinosporus*.

Crepidotus brasiliensis Rick, *Broteria* 24 : 116. 1930.

There is only authentic material preserved, but this is intended to serve as neotype (« typus » Rick), collected and determined by Rick, June 16, 1943 and deposited under no. 12635. Since there is no discrepancy between this and the original diagnosis, Rick's suggestion is acceptable. The spores are smooth, almond-shaped, without mucro, without germ pore, brownish-melleous, 8.2-9 × 4.8-6 µ; basidia 26 × 6.8 µ, 4-spored; hymenophoral trama somewhat gelatinized but moderately strongly so; epicutis little differentiated in this collection; lamellae rather broad and moderately close; stipe none. On

frondose wood. This is *Crepidotus uber*. See also under *Crepidotus uber* (Berk. & Curt.) Sacc. in chapter II.

Crepidotus funalis Rick, *Lilloa* 3 : 424. 1938.

The only existing material, marked co-typus (i- e. neo-type) by Rick was collected at São Salvador, on the bark of living dicotyledonous trees. This specimen is here accepted as neo-type because the main discrepancy, viz. the habitat (which was « on naked earth » in the original collection), can easily be explained : The specimen (no. 20096) has hyaline smooth spores but which are octagonal in polar view, and non-incrusted hyphae without clamp connections and without pigment; there is a distinct stipe on some carpophores and white rhizomorphs are attached to it. Consequently, it is *Clitopilus septicoides* (Henn.) Sing., originally described from Brazil, and occurring on all sorts of substrata, living and dead Cormophyta, earth, etc. It was also found on all these substrata in Rio Grande do Sul, including São Salvador (see Chapter II).

Paxillus panuoides « Fr. » sensu Rick, *Lilloa* 3 : 426. 1938.

Material under this name as well as under the name *Paxillus miniatus* is *Paxillus panuoides* (Fr. ex Fr.) Fr.

Paxillus miniatus Rick, *Broteria* 5 : 19. 1906.

The type of this species does not exist in Porto Alegre, and authentic material has not been preserved either. Material kindly sent by Rick to me (Farlow Herbarium) does not fit in the original description, and its determination was considered as questionable by Rick himself who gave the species up since it does not appear in his *Agarici Riograndensis*. We therefore consider *P. miniatus* Rick as a dubious species which will be a nomen dubium unless re-collected and preserved in the future. Consequently, *Phyllobolites,* the genus based on it, is also a dubious genus unless *Paxillus miniatus* Rick can be cleared up in the future.

Inocybe sublanuginosa Rick, *Lilloa* 3 : 426. 1938.

The type (n° 13543) is in complete disagreement with the description given by Rick. Maybe the specimen was later mixed up and happened to get into the wrong envelope. The specimen now preserved

under this name is a *Lepiota* spec. with small (4-4.5 μ, ellipsoid) spores which are subhyaline in ammonia and pseudoamyloid.

Inocybe hyperythra Rick, *Broteria* **24**: 105. 1930.

The type (no. 13531) from São Leopoldo, collected by Rick in 1930 is in good condition and agrees closely with the original account. Spores with an ornamentation of characteristic high and blunt warts, some of them, in some spores, and sometimes all broadened into crested or ridge-like formations, rather unusual in Inocybe, numbering 13-17 on each spore which measures about 11.8 × 9.3 μ (11.3-13.2 × 9-11.3 μ); metuloids very thick-walled in the middle as well as in the upper portion and reaching 5 μ in wall diameter, with well developed crystalline exudation at the apex, with ampullaceous outline, numerous on edge and sides of the lamellae, about 60-70 × 17-20.5 μ; there are no dermatocystidia in the middle of the stipe. This is evidently a good species of Inocybe.

Inocybe violaceolamellata Rick, *Broteria* **24**: 106. 1930.

There is no type. However, there is material collected by Steffen in 1934 and determined by Rick as *Inocybe violaceolamellata* (no. 13530) This grew on a mossy trunk at São Leopoldo being authentic as well as topotypical. It has reniform spores, about 9.5 × 4.8 μ large. There are no metuloids. This is apparently identical with the lost original collection and probably represents a good species of Inocybe.

Inocybe sordida (Rick) Rick, *Lilloa* **3**: 429. 1938.

Neither under this name nor under *Pholiota sordida* Rick have any specimens been discovered. I doubt that this is an Inocybe. This must be considered as a nomen dubium.

Inocybe megalospora Rick, *Broteria* **17**: 108. 1919.

There are no specimens in existence. But according to the description this must be *Rhodophyllus squamifolius* (Murr.) Sing. which was also collected in fresh condition by me (see chapter II).

Inocybe subvatricosa Rick, *Lilloa* **3**: 429. 1938.

There are no specimens in existence. This is a nomen dubium.

Hebeloma coprophilum Rick, *Broteria* **6**: 79. 1907.

The type (no. 13359) comes from São Leopoldo and was collected by Rick in 1906. The spores are rusty in mass, but, when seen singly in NH_4OH, they are melleous, truncate with broad germ pore, smooth, with thick, compound wall (11.7) 13.7-14.5 (16.5) × (7.5) 8.3-9.5 (11) μ; basidia 4-spored, few 2-spored, 22-23.5 × 7.5-8.3 μ; cystidia on the sides and edges of the lamellae, much more crowded on edge than on sides, ventricose and often attenuated in a step-like manner towards the rounded tip, or ampullaceous, sometimes with a thin layer of a resinous melleous incrustation, others completely naked and hyaline, 29-50 × 10-13.2 μ; epicutis of the pileus cellular, cells forming an epithelium; all hyphae with clamp connections. This grew on dung and has plicate-sulcate margin according to the description (not visible in the dried specimens); the stipe is dusted with gray. It seems to be close to *Agrocybe retigera* (Speg.) Sing. but different. The binomial *Agrocybe coprophila* is preoccupied. A similar Agrocybe has not been found by me during my collecting trips in Rio Grande do Sul, but in the Provinces Buenos Aires and Tucumán. Although the carpophores were somewhat smaller and the spores somewhat less elongated, it is considered to be conspecific and shall be redescribed, under Rick's transferred name, in a forthcoming paper. The new name *Agrocybe neocoprophila* Sing.[1] nom. nov. (= *Hebeloma coprophilum* Rick) is proposed.

Hebeloma austroamericanum « Speg. » sensu Rick, *Broteria* **6**: 79. 1907.

While Spegazzini's species is a good species of *Hebeloma*, Rick's interpretation is erroneous and refers to *Lepista glabella* (Speg.) Sing., originally described from Apiaí, São Paulo, but widely distributed in Southern South America.

Hebeloma subplatense Rick, *Lilloa* **3**: 431. 1938.

There are no specimens in existence. This a nomen dubium.

[1] SINGER, *Not. Syst. Sect. Crypt. Inst. Bot. Ac. Sc. U. R. S. S.* **5**: 99. 1941 (= *A. fimicola* (Speg.) Sing. 1952).

Hebeloma miserum Rick, *Broteria* **24**: 106. 1930.

There is no type specimen in existence. An «authentic» specimen (no. 13358) collected by Steffen in 1934 at São Leopoldo, cannot be identical with the collection that served as a model for the description of 1930. It grew on the earth, its color is different and its spores are smaller. It belongs in the genus Naematoloma. Its spores are olive to purplish fuscous, with broad germ pore, truncate, smooth (5.7)-6.2 7.5 × 4.2-5 (5.5) µ; chrysocystidia present. *Hebeloma miserum* Rick is a nomen dubium.

Hebeloma mammosum Rick, *Broteria* **24**: 106. 1930.

There are no type specimens in existence. This is a nomen dubium.

Hebeloma flavescens Rick, *Broteria* **24**: 106. 1930.

There are no specimens; unless this apparently characteristic species is re-collected and redescribed, it remains doubtful.

Hebeloma naucorioides Rick, *Lilloa* **3**: 432. 1938.

There are no specimens in existence. This is a nomen dubium.

Hebeloma igneum Rick, *Lilloa* **3**: 433. 1938.

The type is not preserved. What is marked «co-type» was collected at São Leopoldo one year after the publication of the species (no. 13351) and on March **22**, 1944 (no. 22608). These collections are very unlike each other. The former is identical with *Leucopaxillus gracillimus* Sing. & Smith, the latter is an *Agaricus* spec. Neither agrees with the original account. *H. igneum* is therefore a nomen dubium.

Hebeloma lignicolum Rick, *Lilloa* **3**: 433. 1938.

There are no specimens in existence. This is a nomen dubium.

Nolanea vulpina *Broteria* **24**: 108. 1930; **Nolanea badia** Rick, *l. c.*; **Nolanea pleopodioides** Rick, *Lilloa* **3**: 437. 1938; **Nolanea brunneogrisea** Rick, *l. c.*; **Eccilia citrinella** Rick, *Lilloa* **3**: 438. 1938; **Eccilia striaepes** Rick, *Broteria* **18**: 56. 1920; **Eccilia atrata** Rick, *l. c.*; **Eccilia violacea** Rick, *l. c.*; **Eccilia purpureopunctata** Rick, *Lilloa* **3**: 439. 1938; **Eccilia intermedia** Rick, *Lilloa* **3**: 439. 1938.

On the above species no data could be gathered, either because of their absence from the herbaria searched for them, or else because, if present, they did not yield any useful anatomical data.

Eccilia anastomosans Rick, *Broteria* **24**: 105. 1930.

The type (no. 12973) from São Leopoldo, collected in 1930, has angular spores which have rounded angles in all positions, pinkish stramineous walls, and show distinct axial symmetry; they are small: 4.2-5.5 × 4.2-4.5 µ. The pileus is gray. The carpophores have the habit of a Clitopilus. This is undoubtedly a Rhodophyllus, and the transfer to that genus is proposed: *Rhodophyllus anastomosans* (Rick) Sing. comb. nov.

Eccilia nivea Rick, *Lilloa* **3**: 439. 1938.

The type (no. 12975) from São Leopoldo, collected by Rick in 1930, has distinct longitudinal reinforcements in the sporewalls and appear octagonal in polar view; they are hyaline-stramineous, 5.5 × 3.5 µ; hyphae without clamp connections; there is a distinct membranous pad at the base of the stipe. This is obviously identical with *Clitocybe scyphoides* var. *submicropus* (Rick) Sing. (redescribed in *Farlowia* **2**: 556. 1946).

Clitopilus griseus Rick, *Broteria* **18**: 56. 1920.

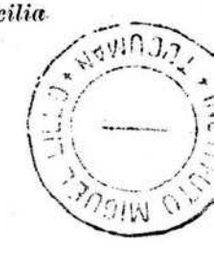
No specimens in existence. A nomen dubium.

Clitopilus atrotuberculosus Rick, *Broteria* **18**: 56. 1920.

No specimens in existence, a nomen dubium.

Clitopilus submicropus Rick, *Broteria* **6**: 77. 1907.

Material of this species has been studied previously (*Farlowia* **2**: 556. 1946) and was found to belong to a variety of *Clitopilus scyphoides* (Fr.) Sing. var. *submicropus* (Rick) Sing. Cf. also *Eccilia nivea* Rick!



Clitopilus neglectus Rick, *Broteria* **18**: 57. 1920.

There are no data available; no type specimens seen.

Claudopus fimbriatus Rick, *Broteria* **18**: 58. 1920.

No type in existence. A nomen dubium.

Claudopus subvariabilis Rick, *Broteria* **24**: 104. 1930, non Speg. (1889).

There are no specimens available, and the description is rather ambiguous. It is a homonym of a species described much earlier by Spegazzini which belongs to the genus *Melanotus*.

Pluteus fibrillosus Rick, *Lilloa* **3**: 444. 1938.

There are no specimens in existence. A nomen dubium.

Pluteus cristatulus Rick, *Lilloa* **3**: 445. 1938.

There are no specimens in existence. A nomen dubium.

Pluteus sensitivus Rick, *Broteria* **24**: 104. 1930.

There are no specimens in existence. A nomen dubium. One collection from São Salvador, 1944 (nº 20770), labeled *Pluteus sensitivus* var. *macrospora* is actually a *Pluteus* spec. but hardly identical with the type.

Pluteus leptonia Rick, *Lilloa* **3**: 445. 1938.

The type, or what appears to be the type of this species (no. 14525) is labeled *Pluteus leptonioides* Rick. It was collected at São Leopoldo in 1936. The spores are typical Rhodophyllus-spores, and the species should eventually be transferred to Rhodophyllus unless identical with a species already described elsewhere-a question which I cannot answer positively at the moment.

Pluteus exiguus Pat. sensu Rick, *Lilloa* **3**: 446. 1938.

There is a specimen labeled *Pluteus exiguus* var. *venosa* Rick. This is a species ocurring likewise in the Tucumán region of Argentina and has been determined (tentatively) *Pluteus phlebophorus* sensu

Lange. It is described by Singer & Digilio in *Lilloa*: **25** 268. (1951) 1952.

Leptonia rosea Rick, *Broteria* **17**: 107. 1919; **Leptonia straminea** Rick, *l. c.*; **Leptonia olivacea** Rick, *l. c.*; **Leptonia alboserrulata** Rick, *l. c.*; **Leptonia fuligineostraminea** Rick, *l. c.*; **Leptonia hispida** Rick, *Lilloa* **3**: 449. 1938.

None of these species has been studied because of lack of suitable specimens that might be considered types.

Leptonia brunneogrisea Rick, *Lilloa* **3**: 449. 1938.

The only collection referring to this species is a true Rhodopyllus, but it has smaller spores than indicated by Rick and I doubt that it is the same as the original collection, which must have been lost. The type is perhaps *Rhodophyllus squamifolius* (Murr.) Sing. See also under *Inocybe megalospora* Rick.

Leptonia viridipes Rick, *Lilloa* **3**: 450. 1938.

No data available.

Annularia conicorubella (Rick) Rick, see *Pluteolus conicorubellus* Rick.

Entoloma alboflavidum Rick, *Broteria* **24**: 107. 1930.

No data available.

Anellaria diffracta Rick, *Broteria* **24**: 115. 1930.

The only specimen preserved is a dark-spored agaric, possibly *Agaricus* spec.

Pilosace brasiliensis Rick, *Broteria* **18**: 61. 1920.

No specimens in existence. The species is a doubtful one, probably an *Agaricus* spec. which has lost its annulus.

Stropharia crassa Rick, *Broteria* **6**: 79. 1907.

No specimens were found referable to the original account.

Stropharia subcyanescens Rick, *Broteria* **24**: 114. 1930.

What appears to be a neotype (no. 15227), collected on dung at Santa María 1935, agrees in all characters with *Psilocybe cubensis* (Earle) Sing. Rick's species should be considered a synonym of the latter.

Psilocybe tortipes Speg. sensu Rick

Material determined so by Rick has turned out to be *Naematoloma subumbonatescens* (Murr.) Sing. rather than the species as understood by Spegazzini originally (= *Panaeolus subbalteatus* vel aff.). *Naematoloma subumbonatescens* is indicated as a synonym of *Naematoloma ericaeum* (Fr.) Sing. in a recent paper by A. H. Smith. It is true that these species are very closely related but *N. subumbonatescens* has somewhat larger spores, lacks the olive and yellow color of the lamellae and seems to prefer more open places.

Panaeolus lignicola Rick, *Broteria* **24**: 113. 1930.

The type has not been preserved. There is, however, a collection from Santa María 1935 (no. 14493), but it is very doubtful whether or not this is conspecific with the type. The existing material is a coprinaceous species, Psathyrella or Panaeolus, but has not been analyzed further.

Anthracophyllum hasselmannii Rick, *Rodriguesia* **2** (8): 43. 1937.

This came from the region of Rio de Janeiro. No specimens are preserved.

Boletus brasiliensis Rick, *Ann. Mycol.* **3**: 235. 1905.

Authentic and type material was analyzed by me in *Farlowia* **2**: 298. 1945, and the species was transferred to Xerocomus as *Xerocomus brasiliensis* (Rick) Sing.

Boletus mutabilis var. **austroamericanus** Rick, *Broteria* **5**: 223. 1906, cf. *Broteria* **6**: pl. VI, figura 3, 1907.

There are no specimens in existence but the photograph published 1907 seems to refer to *Phaeogyroporus tropicus* (Rick) Sing., broad-pored form.

Boletus ? spadiceus « Karst. » sensu Rick

There are no specimens. Apparently a misdetermination.

Boletus cinnamomeus Rick, *Egatea* **11**: 16. 1926.

There are no specimens in existence. This is a nomen dubium.

Boletus neoolivaceus Rick, *Broteria* **23**: (*Serie de Ciencias Naturais* **6**): 167. 1937.

There is no type at Colegio Anchieta; the type is at the Farlow Herbarium under the name *Boletus olivaceus*. This specimen has not been restudied by me.

Boletus tropicus Rick in Rehm & Rick, *Broteria* **5**: 223. 1906.

An authentic specimen is in the Patouillard Herbarium at Farlow Herbarium under the name *Boletus crassus*. This is the only authentic specimen in existence. It was authenticated by Rick in a letter to the author. On the basis of this specimen, the species was transferred to the genus Phaeogyroporus as *Phaeogyroporus tropicus* (Rick in Rehm & Rick) by Singer (see *Farlowia* **2**: 242. 1945) and redescribed in *Lilloa* **23**: 233. 1951.

Phylloporus rompelii Pat. & Rick in Rick, *Broteria* **6**: 81. 1907.

This is preserved in the Patouillard Herbarium at Farlow Herbarium and was restudied by Singer, Boletineae of Florida II, Farlowia 2: 247. 1945. It was shown already in 1938 (Singer in *Revue de Mycologie* **3**: 172. 1938) that this is actually a species of Gyrodon. Further study on fresh material collected at the type locality and various other localities has revealed that *Gyrodon rompelii* (Pat. & Rick in Rick) Sing. is specifically different from *Gyrodon merulioides* (Schwein.) Sing. as well as *Gyrodon proximus* Sing. and is connected with *Sapindaceae* (see chapter II).

Phylloporus flavipes Rick, *Broteria* **23** (*Serie de Ciencias Naturais,* **6** (4): 168. 1937.

The only specimen in existence (no. 14446) cannot be interpreted with absolute certainty, but it seems to be the same as *Xerocomus brasiliensis* (Rick) Sing.

Braunia alba Rick, *Egatea* 19 : 112. 1934.

The type and authentic material, apparently identical with each other, are deposited sub no. 12543, 12544, and 12545 respectively, under the binomial *Brauniella albida* Rick [1]. No. 12545, a young specimen from Cacequí, is particularly interesting and in comparatively good condition. The type came from São Leopoldo where it was collected by Braun, and the earlier authentic material is at the same time a topotype.

The genus belongs in the family *Secotiaceae* as currently understood. It shows tramal plates of the Secotium type which produce an enormous number of mature basidia and spores in an egg stage reminding one macroscopically of Geastrum. In the overmature (ruptured, agaricoid) stage, the basidia have all collapsed and only free, fully mature spores are found. The consistency is apparently the same as in *Secotium agaricoides*. Furthermore, the spores are formed more orthotropically than in the Aphyllophorales and Agaricales, yet there is a definite tendency toward heterotropism where the sterigma had a more than usual lateral position off the apex of the basidium, and a more half-sickle-like shape. The spores are consequently subortho tropic to a variable degree; they have a firm and slightly thickened wall whereby the endo-and episporium are intimately agglutinated and difficult to distinguish in oil immersion, but separate naturally at the hilar end which, in immature spores, is often knob-like and mucronate or just verruciform, in older spores sometimes tooth-shaped; the spores are stramineous, later light melleous-stramineous,

[1] Rick was obviously under the impression that he created a homonym when first publishing the genus *Braunia* because there was a genus *Braunea* which according to the Kew Index is a synonym. *Braunea* was named for a Mr. Braune while *Braunia* is named for Padre Braun. Although there are still various interpretations of the homonym rule, I cannot see that it forbids the coexistence of two legal generic names *Braunea* and *Braunia*, especially since the present rules consider names with very similar spelling homonyms only under certain conditions (which do not apply here) and if they are merely representing « a difference in transcription of a non-Latin or non-Greek word in particular in case of the same personal name... » Since *Braunea* and *Braunia* do not refer to the same personal name, they are not homonyms. In the rules valid at the time of Rick's publication, there was also a note (3) under Art. 70 saying that « if there is a serious risk of confusion, they should be treated as orthographic variants ». This reads now « When two or more generic names are so similar and the plants so closely related that they may be confused, one name should be rejected ». Since *Braunea* and *Braunia* are not related, Art. 70 does not apply.

smooth, nonamyloid, ellipsoid-subfusiform, 15.7-20 × 9.3-12.3 µ. Basidia obconic, tetrasporous, with four cone-shaped to half-sickle-shaped sterigmata, straight to obliquely and slightly curved and rather distant one from another; the voluminous cystidia indicated by Rick on the fresh material were not found (« cystidiis hyalinis delicatissimis ovalibus 80 × 40 µ» Rick), probably collapsing in an early stage, but there are still « empty » basidiomorphous bodies, measuring 43-48 × 16-18 µ (pseudoparaphyses); hymenium continuous on both sides of the tramal plates, the trama of the plates hyaline, consisting of hyphae in what appeared to be inverse arrangement, intermixed with some oleiferous hyphae in irregular arrangement; oleiferous hyphae of irregular shape and frequently wavy outline, numerous in both the tramal plates and the peridium; walls of the ordinary hyphae not thickened anywhere, not gelatinized, the thin filamentous hyphae ending in thickened cylindrical elements with few septa; several septa seen without clamp connections, and the latter apparently absent in all tissues; all hyphae nonamyloid.

While there can be no doubt that this fungus is a species of the *Secotiaceae*, at least in the classical sense, it shows striking similarities with the genus *Volvariella (Agaricales, Amanitaceae)*, especially with *Volvariella cnemidophora* (Mont.) Sing. (*Volvaria cnemidophora* (Mont.) Sacc.). The latter was compared macro and microscopically in every detail with the three collections cited above. The resemblance of the spores, basidia, cystidia, — the latter as described by Rick for *Braunia alba* Rick — the oleiferous hyphae, the aspect of the hyphae forming the tramal plates and lamellae, the pseudoparaphyses, also the structure, shape and chemical reactions of the hyphae, and the color and appearance of the dried specimens is very striking. The spores are so similar that they can be distinguished only by somewhat larger size (this reminds one of Thaxterogaster where the spores are also larger than in the corresponding species of Cortinarius) although there are species in the same section of Volvariella which have larger spores (e. gr. *V. speciosa* of Europe) and by the structure of the base of the spore which is slightly different which may be explained by the fact that their formation and discharge is slightly different also. There is a saccate knob-like formation in most young spores which is missing in the spores of Volvariella as far as we have been able to tell, yet the splitting of endo- and episporium is also present in many spores of Volvariella; the cystidia in Braunia must have been very striking since they were emphasized by

Rick who says they were visible with a hand lens and pedicellate, i. e. much like those of Volvariella. I find in my notes on *Volvariella cnemidophora* that they are up to 75 µ long at the edge of the lamellae, and 20 µ broad, and break down easily as they are very fragile; the same pseudoparaphyses as observed by me in Braunia are also present in *Volvariella cnemidophora*. The observation of the structure of the tramal plates of the Braunia was somewhat difficult, yet the arrangement of the hyphae seems to be exactly the same as in the Volvariella. The negative iodine reaction of both hyphae and spores coincides likewise. The volva at the base of the stipe is of exactly the same texture and appearance as the agaric and the gastromycete, and even the color of the dried specimens is so similar in *Braunia alba* and in the white forms of *Volvariella cnemidophora* that it is easy to mix up the specimens. The color of the spores under the microscope as well as on the tramal plates and lamellae is exactly equal.

The affinity of *Braunia alba* and Volvariella is so striking that there is no need of further insisting on it. Rick himself noticed it and made a remark about it (« uniens ea — i. e. Gyrophragnium et Secotium — cum Volvaria »). Is, then, Braunia perhaps a retarded atavistic form of *Volvariella cnemidophora*, such as the gastroid forms of *Boletinus decipiens* must be interpreted as gastroid aberrations of *Boletinus decipiens* in Florida? The answer must be negative for various reasons:

1. In Florida, the normal boletoid fruiting body was gathered side by side with the gastroid condition. In Rio Grande do Sul, neither *Volvariella cnemidophora* nor *V. speciosa* have been observed during 40 years of collecting by Rick, and other collectors have no record either. Only the former of the two agaric species is likely to occur, but even if it would occur, it would be easy to separate it, aside from its agaricoid behavior in the development of the fruiting bodies, the smaller, spores, etc.

2. The carpophores of *Braunia* are not retarded, but the development differs in the same way as the development of other secotiaceous fungi differs from hemiangiocarpous agarics related to them. While the gastroid condition of *Boletinus decipiens* is characterized by the fact that the fruiting bodies do not open in the Agaricales manner but remain in the « egg stage », the Braunia carpophores do open eventually in a secotiaceous fashion although the spores are already fully mature in the « egg stage ». The opening takes place merely in

order to make the dissemination of the spores accumulated on the tramal plates, possible.

3. In *Braunia*, the attachment of the spores to the sterigmata and their (near) axial symmetry are in principle those of the *Secotiaceae*, not those of the Agaricales. Even if their symmetrical shape is less constant and less distinct than in other Gastromycetes, this may be explained by the fact that the sterigmata are spaced widely, and where they are very distant from the summit of the basidium, they are bound to become half-sickle-shaped and the spores subheterotropic. The same can also be observed in various other Gastromycetes such as *Torrendia* which does not show any direct relation with Agaricales. The spacing of the sterigmata and their often half-sickle-shaped appearance in this group may be interpreted as one of the conditions that made it possible for this group of Gastromycetes to transform themselves into agarics with specialized exogenous spore discharge.

4. *Braunia* is not a local aberration. It has been observed at two different localities in Rio Grande do Sul, and seems to have a restricted geographic area of its own, different from the geographic area of any known Volvariella. *Volvariella cnemidophora* and its allies are very striking large mushrooms difficult to overlook.

If then *Braunia* is a truly secotiaceous fungus, generically different from Volvariella, what is its position in the Secotiaceae, and what are the phylogenetical consequences of this position?

Braunia differs in the color, shape, wall structure of the spores and the presence of a volva from other species of Secotium, especially from the group of *Secotium gueinzii*, the type of the genus *Secotium*, i. e. from *Secotium* sensu stricto (See Singer, *Lilloa* **22**: 742. 1949 (1951) and Heim, *Revue de Mycologie* **16**: 132. 1951). The voluminous hyaline cystidia described by Rick are an additional differentiating character in comparison with other groups of *Secotium* sensu lato. In Zeller's scheme *Braunia* would (like *Secotium conei* Heim), enter the group of genera *Montagnea-Longia-Gyrophragmium* from which it differs sharply in the characters of the spores and in the habit of mature carpophores. While *Secotium conei* Heim, in any natural classification, comes close to the group of species named Thaxterogaster by me [1], *Braunia* appears to represent a group in itelf, which

[1] *Thaxterogaster magellanicum* Sing., *Thaxterogaster violaceum* Sing. and *Thaxterogaster porphyreum* (Cunningham) Sing. comb. nov. (*Secotium porphyreum* Cunn.). The last named species, *T. violaceum* and *T. porphyreum* are obviously congeneric

represents a link between *Torrendia* and *Volvariella*. The type of *Torrendia* has, according to my notes, subhyaline, smooth, elongated spores (12-17 × 6.2-7 μ) which are nonamyloid, 4-spored basidia with distant subapical sterigmata 6-7 μ long, the main body about 20 × 10 μ. At the base of the stipe there is a volva like that of *Braunia,* and there is no germ pore at the apex of the spores. It seems quite reasonable to assume that there is a phylogenetic line leading from Torrendia-like Gastromycetes to the *Amanitaceae.* Already in 1936 (*Ann. Mycol.* **34**: 317. 1936), I have mentioned the possibility of Torrendia being the starting point of a line leading from the Gastromycetes to the *Amanitaceae,* yet the absence of a connecting link made this, according to the sentence quoted here, rather difficult. Now, this intermediate form, having reached the level of the unipileate Gastromycetes close to Agaricales, like *Galeropsis, Thaxterogaster, Montagnea,* etc., has been found, and its importance for the systematics of Basidiomycetes cannot be denied. Among the disadvantages of the phylogenetic theory considering the Agaricales as descendents of the Gastromycetes, I (*Lilloa* **22**: 120. 1949 (1951) enumerated in the first place that it cannot in detail explain the derivation of the *Amanitaceae.* This disadvantage has now disappeared. In fact, aside from the *Russulaceae,* this is the first white (-pink) spored family that can be linked with confidence with one of the gastroid families, and the only important link missing is that between the *Tricholomataceae* and the Gastromycetes.

While, in the case of *Thaxterogaster,* the *Astrogastraceae,* and the *Rhizopogonaceae,* there are certain indications as to the probable direction of the phylogenetical trend — not proves, to be exact — *Braunia* does not offer very much in this regard. But looking at the whole of our results up to the present day, one is led to think that

(see data and figures of Heim, *l. c.* p. 145, and pl. 3, fig. 1-5) but not conspecific since the former lacks a well developed stipe. In my publication (*Mycologia* **43**: 215. 1951), I have indicated that « it is possible that some of the rough spored species of *Secotium*... described from New Zealand and Australia, belong here... » Heim's new data on *Secotium porphyreum* Cunn. corroborate this. Even if they are not specifically identical with the South American species, they provide a beautiful example of « austral-antarctic disjunction » of area, comparable with that of the genus Cyttaria and the host genus Nothofagus. Why the existence of another related species or rather genus (*S. conei*) with somewhat but slightly aberrant spore ornamentation should weaken the argument for phylogenetic relations between *Thaxterogaster* and *Cortinarius,* as suggested by Heim, is not understandable.

the derivation of *Braunia* and *Torrendia, Galeropsis, Thaxterogaster, Montagnea,* all from various agarics, by «degradation», — agarics as different morphologically and anatomically as *Volvariella, Bolbitius* and *Conocybe, Cortinarius, Coprinus* — would at least preserve the characters (rightly) considered as «advanced» such as clamp connections and germ pore of the spores. Yet, some of the gastroid forms like *Galeropsis* have clamp connections while the majority of the *Bolbitii* has none; some of the species of *Galeropsis* have no germ pore (*G. allospora* Sing. from Patagonia). In all cases, the number of species is larger in the agaric than in the gastromycete. And if we need an example for a gastroid form, related to an agaric, and being neither xerophytic nor hypogaeous, we may name *Braunia alba.* Why, then, would degradation begin here? Is it furthermore possible to think that a perfectly epigaeous humiphilous agaric species begins adapting itself to special conditions by showing gastroid tramal arrangement (case of the retarded Cortinarii with anastomosing lamellae in Tierra del Fuego), or failing to expand and to form a pileus whith free exposed hymenophore at maturity (case of the gastromycetoid condition of *Boletinus decipiens*); or why should it form a double veil frequently attached to the lamellae (as in the case of the annulus-superus of *Amanita virosa* which hampers the discharge of the spores) in *antecipation* of future phylogenetic developments? Moreover, why should a group with exceptionally, under certain circumstances of growth and ecology, degraded characters resulting from various families of Agaricales, such as the *Secotiaceae, Rhizopogonaceae,* « *Astrosporaceae* » continue to follow a line of regressive evolution until they finally arrive at seemingly simple organization, already reached by other organisms by progressive development. And if so, one asks oneself, why should it be permitted to assume this while, at the same time, it is considered impossible to assume that adaptation to free spore discharge should have been lost once and regained at a higher level of evolutionary development? If one of these hypotheses is labeled improbable, then, fairly, the other should share the same fate, and if one is admitted, the other should logically appear permissible also. Besides, it seems to be necessary to state here that our facts regarding the origin of the Lower Gastromycetes are scanty, and their derivation from Corticiaceae-like ancestors is purely and solely a working hypothesis.

A phylogenetic development, in order to be likely, must be successful. While the agarics linked with the Gastromycetes named

above, are undoubtedly biologically a successful group, rich in species, variability, individuals in ecologically different areas, and capable of assuming new and important biological roles such as mycorrhiza (*Amanitaceae, Russula, Lactarius, Cortinarius*), the same cannot be said about the secotiaceous fungi discussed here. Their geographic area is restricted and does not show signs of a wide and successful specification; in the contrary, it shows a tendency towards disjunction (case of *Thaxterogaster*) which is always considered as indicative of a diminishing area, never characteristic for relatively recent forms. We conclude therefore that the Agaricales have as their ancestors certain Gastromycetes, one of these being *Braunia* which is the ancestral form of the *Amanitaceae*, especially the volvate ones, with most similarity shown between *Volvariella* and *Braunia*, and arrive at the further hypothesis that the volvate agarics must be more primitive than their non-volvate relatives.

OTHER SPECIES REPRESENTED IN RICK'S HERBARIUM

Some of the unpublished binomials and published misdeterminations are substatiated in Rick's herbarium by determinable specimens. Some of these are enumerated below:

Smithiomyces mexicanus (Murr.) Sing. (Farlow Herbarium, ex Herb. Rick, perhaps also Anchieta no. 12243).

Russula puiggarii (Speg.) Sing. (Farlow Herbarium ex Herb. Rick, also Anchieta no. 14925 as *Russula mollis* and no. 14929 as *Russula theissenii*).

Neopaxillus echinospermus (Speg.) Sing. (Farlow Herbarium ex Herb. Rick, also no. 13532, Anchieta).

Leucopaxillus rickii spec. nov. (Anchieta no. 21048, sub *Hebeloma*).

« Pileo solido, carnoso, toto albo, plano, levi, margine involuto; stipite 30-50 mm alto, solido, inferius inflato » (Rick in herbario). Sporis 3.8-5.7 × 2.8-3.8 µ, verrucosis, fortiter amyloideis. Inter folia delapsa in silva subtropicali e mycelio pelliculoso abundante ecrescens.

Estação São Salvador, April 22, 1944, Rio Grande do Sul, Brasilia, leg. J. Rick. Typus in herbario Rickiano, Colegio Anchieta, Porto Alegre.

This collection still shows remainders of frondose trees at the bases of the stipe; the lamellae are now subdecurrent but not arcuate-decurrent; the habit is more tricholomatoid than clitocyboid, much like *Leucopaxillus laterarius*, but the taste is mild.

Lepista glabella (Speg.) Sing. (Anchieta no. 13362 sub *Hebeloma*).

Melanoleuca spegazzinii (Sacc. & Sydow) Sing. (Anchieta no. 21128, sub *Paxillo*).

Oudemansiella steffenii (Rick) Sing. (Anchieta no. 20594 sub *Collybia* sp.).

Collybia butyracea (Bull. ex Fr.) Kummer (? Anchieta no. 12346, under this same name).

Marasmiellus icterinus Sing. (Anchieta no. 20669, sub *Omphalia*).

Marasmiellus fascicularis Rick in Singer (Anchieta no. 22750 under this same name).

A description will be given in chapter II.

Crinipellis stupparia (Berk. & Curt.) Pat. (*Marasmius thwaitesii* sensu Theissen).

Heimiomyces tenuipes (Schwein.) Sing. (Farlow Herbarium, ex Herb. Rick, and Anchieta no. 20483 as « Collybia, non velutipes »).

Pluteus fibulatus Sing. in Singer & Digilio, *Lilloa* **23**: 252. 1951 (Anchieta no. 14527 as *Pluteus velutinus*, in an unpublished manuscript as *Pluteus velatus*).

This species had been found previously in Tucumán. The material from São Leopoldo, collected by Rick in 1939 can be recognized as the same species, but I believe that the indication of a veil in the unpublished notes must be due to an error.

Leucocoprinus cepaestipes (Sow ex Fr.) Pat (? Anchieta no. 1726 sub *Armillaria*).

Bolbitius reticulatus (Pers. ex Fr.) Ricken (Anchieta no. 14493 as *Phlegmacium ignatianum*, in an unpublished manuscript as *Phlegmacium atrum*).

Crepidotus quitensis Pat. (Anchieta no. 22924 as *Crepidotus* spec.).

Favolaschia flava (Bres.) Sing. (Anchieta no. 14951, as *Laschia auriscalpium* Mont.).

SPECIES MERELY INDICATED BY RICK

The following species are indicated in Rick's papers as occurring in Rio Grande do Sul but were not restudied. However, they seem to have been determined correctly since their occurrence in Southern South America is established beyond doubt, and the appearance of the specimens seems to corroborate the determination, or else the species are so common and easy to recognize that an error appears improbable:

Lepista nuda (Bull. ex Fr.) W. G. Smith (as *Tricholoma nudum*).

Lepista sordida (Fr.) Sing. (as *Tricholoma sordidum*).

Laccaria tetraspora Sing. (as *Clitocybe laccata*).

Collybia dryophila (Bull. ex Fr.) Kummer (as *Collybia dryophila* Bull.).

Mycena sanguinolenta (A. & S. ex Fr.) Kummer (as *Mycena sanguinolenta* A. & S.).

Mycena mucor (Batsch ex Fr.) Gillet sensu Lange (as *Mycena mucor* Batsch).

Resupinatus subrhacodium Sing. (as *Pleurotus applicatus* in *Lilloa* 2: 298. 1938 and as *Pleurotus atrohispidus* Rick in herb. Farlow).

Hohenbuehelia angustata (Berk.) Sing. (as *Pleurotus petaloides* Bull.).

Pleurotus ostreatus (Jacq. ex Fr.) Kummer (as *Pleurotus ostreatus* Jacq.).

Panus rudis Fr. (as *Panus rudis* Fr.).

Marasmius echinatus Theissen ex Sing. (as *Marasmius cohaerens* Pers.).

Anthracophyllum lateritium (Berk. & Curt.) Sing. (as *Xerotus berterii* Mont.).

Agrocybe puiggarii (Speg.) Sing. (as *Pholiota praecox* Pers.).

Agrocybe fimicola (Speg.) Sing. (as *Naucoria pediades* Fr.).

Gymnopilus spectabilis ssp. *pampeanus* (Speg.) Sing. (as *Pholiota spectabilis* Fr.).

Volvariella bombycina (Pers. ex Fr.) Sing. (as *Volvaria bombycina* Pers.).

Volvariella pusilla (Pers. ex Fr.). Sing. (as *Volvaria parvula* Weinm.).

Agaricus campestris L. ex Fr. or *A. pampeanus* (Speg.) Speg. (as *Psalliota campestris* L.).

Melanophyllum echinatum (Roth ex Fr.) Sing. (as *Psalliota echinata* Fr.).

Stropharia coronilla (Bull. ex Fr.) Quél. (as *Stropharia coronilla* Bull.).

Panaeolus phalaenarum (Fr.) Quél. (as *Panaeolus phalaenarum* Fr.).

Anellaria sepulchralis (Berk.) Sing. (as *Panaeolus solidipes* Peck).

Pseudocoprinus disseminatus (Pers. ex Fr.) Kühner (as *Psathyrella disseminata* Pers.).

Coprinus comatus (Müller in Fl. Dan. ex Fr.) S. F. Gray (as *Coprinus comatus* Fr.).

Polyporus tricholoma Mont. (as *Polyporus arcularius* var. *tricholoma* Mont.).

Polyporus caespitosissimus Sing. (as *Favolus brasiliensis* Fr.).

Polyporus dermoporus Fr. (*Favolus brasiliensis* Fr.).

Whitfordia elegans (Sprengel ex Fr.) Sing. (as *Lenzites repanda* Fr.).

Pycnoporus sanguineus (L. ex Fr.) Murr. (as *Trametes sanguinea* L.).

Diacanthodes philippinensis (Pat.) Sing. (as *Polyporus coffeae* Wakef.).

II. SPECIES OCCURRING IN RIO GRANDE DO SUL WHICH WERE COLLECTED AND DESCRIBED BY OTHERS THAN RICK

The present enumeration contains mainly the results of various collecting trips made jointly by B. Rambo and R. Singer, and also some collections sent or given by Steffen, Sehnem and others and worked out and determined by Singer.

VILA MANRESA NEAR PORTO ALEGRE

The specimens collected here come from one of the hills near the city of Porto Alegre in subtropical forest, all collected by Singer October 29, 1951. The forest is strongly modified by human activity but consists almost exclusively of native trees. The soil was dry after one week of hot, dry weather.

Pleurotus rickii Bres.

Young specimens of this species were found on an undetermined wet log, n° B 14.

This is identical with specimens collected in the province of Tucumán, Rep. Argentina, and proves the existence of the same fungus in Rio Grande do Sul, corroboring, thus, the interpretation of the type of *Pleurotus rickii* as well as of the misdetermination of *Armillaria procera* by Rick. A revised description of this species is given in Singer & Digilio, in *Lilloa :* **25**: 126. 1951.

Marasmiellus fascicularis Rick spec. nov.

Pileo pallide cinnamomeo («paloma» in centro, subalbido in zona marginali), hygrophano, in statu sicco pallidissime cinnamomeo vel subalbo, radiatim innate fibrilloso, fibrillis cinnamomeis, interspatiis albidis, sed in zona centrali interspatiis albidis absentibus, dense sulcato ad marginem, convexo, dein depresso circum umbonem obtusissimum, usque ad 30 mm lato Lamellis albis vel gilvo-albidis, attenuato-liberis, confertis, angustis (1-1.5 mm. latis) ; sporis in cumulo haud observatis. Stipite lana tenui alba superficiem interiorem castaneo-fuscam obtegente, levi, saepe longitudinaliter compresso sed haud raro tereti, subaequali vel leniter incrassato basin versus 35-40 × 1.5-2 mm. ; tomento basali albo, lanoso. Carne alba, sed in cortice stipitis castaneo-fusca, immutabili ; odore nullo vel subnullo ; sapore miti.

Sporis levibus, hyalinis, inamyloideis, ellipsoideo-oblongis, 7-7,5 × 3.6-4, rarius 6-7 × 3-3.5 μ (vix maturis) ; basidiis 36 × 7 μ, tetrasporis ; cystidiis versiformibus, clavatis vel ventricoso-ampullaceis, levibus, hyalonis, sat numerosis et manifestis, 38-69 × 10-14.5-(30) μ ; cheilocystidiis nullis sed cystidiis ad latera lamellarum et ad aciem sat numerosis sed in acie transitiones versus cellulas terminales hypharum usque ad aciem penetrantium formantibus ; hyphis illis nodulosis vel subdi-

verticulatis ; transitionibus illis cystidiis simillinis sed ad apicem attenuatis, superne nodosis, angustioribus ; tramate hymenophorali regulari, ex hyphis hyalinis, levibus, filamentosis consistente ; epicute pilei ex hyphis filamentosis distanter irregulariterque diverticulatis consistente quod excrescentiis erectis breviter cylindraceis vel nodulis vel ramulis erectis (2-2.5 μ diam.) elongatis obtusis vel subacutis hyalinis ornatae sunt ; hypodermio ex hyphis latioribus pigmento paulum intenso numquam incrustante praevisis efformato, hyphis omnibus inamyloideis, fibulatis.

Ad folia dejecta Myrtacearum, rarissime in ramulis minutis earumdem gregatim. Rio Grande do Sul, Brasilia. Typus in LIL.

This species was found in the herbarium Rick under a herbarium name the specific epithet of which was applied to identical material rediscovered near Porto Alegre. As for a similar species, or variety of this species, see below. Rick's specimen was collected and determined by Rick, Estacão São Salvador, November 21, 1944, i. e. approximately in the same season of the year.

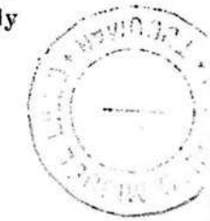
Marasmiellus fascicularis Rick ex Sing. is a good species of *Marasmiellus* both micro- and macroscopically well characterized, but would be taken for a Collybia by most collectors, at least at first sight.

Oudemansiella canarii (Junghuhn) Höhnel

This species was found several times, here as well as in other localities practically all over Rio Grande do Sul, and the specimens varied, just as in Argentina and Florida, U. S. A., in size and color as well as in host preference, but there are no discernible races or varieties, and no host specialization. A complete description has been given by me in *Mycologia* 37 : 436. 1945. A careful comparison of a good description of the South Asiatic specimens of the species should make it possible to corroborate Höhnel's assertion about the identity of the eastern and the western form. The types of eastern synonyms which I have seen seemed to be quite identical, yet it is possible although not probable that there are certain anatomical and macroscopical discrepancies constant enough to justify a distinction of races or species. Our own collection is n° B 10[a] LIL.

Dictyopanus pusillus (Lév.) Sing.

On a myrtaceous stump, B 9. This species is extremely common all over ther warmer regions of South America. It was repeatedly



observed in localities where Rick collected what he called *Polyporus Rhipidium* Berk.

Schizophyllum commune Fr.

Common here as well as all over the State.

Mycena, sect. **Rigidipedes**, aff. **alcalina** (Fr.) Kummer

This specimen, n° B 12, is evidently identical with *Mycena alcalina* var. *brasiliensis* Rick but it is not conspecific with *M. alcalina.*

Agaricus spec.

Five species of *Agaricus* were collected, but the final determination of these collections is not yet available (n° B 1, B 15-18).

Agrocybe aegerita (Brig.) Sing.

On living trunk of *Allophylus edulis,* 2 m above the ground (see also later collections), B 8, LIL.

Gymnopilus peliolepis (Speg.) Sing.

On dead wood of dicotyledonous tree, B 20, B 21, LIL. See also p. 117.

Clitopilus rhodotrama Sing.

This species, described from Northern Argentina, is here listed for the first time, as occurring in Brazil, n° 24, LIL.

Rhodophyllus spec.

A small species, not yet identified, n° B 22, LIL.

Aside from the Agaricales mentioned above, a *Scleroderma* spec., an *Auricularia* spec., one white *Poria,* a Heterobasidiomycete, and various micromycetes were collected.

SÃO LEOPOLDO

The park of the Jesuit Home for the Aged is a dense subtropical forest consisting of Dicotyledonous trees, palms, *Bambusaceae,* and remained almost unaltered. This is the very spot where the majority

of Rick's types have been collected. Unfortunately, the weather was rather dry, and the collecting, on the 31 st of October 1951, was rather mediocre. Nevertheless, some interesting material, including some topotypes, could be gathered.

Callistosporium luteofuscum Sing. spec. nov.

Pileo fusco (pl. 15, H-12 vel J-12), hygrophano, sordide ochraceo (pl. 12, F-6) in statu sicco, primum siccante in zona inter centrum et marginem, demum ubique pallescente, in maturis breviter pellucide striatello sed estrio in siccis, glabro, convexo, umbilicato vel subumbilicato, 8-15 mm lato; Lamellis subolivaceo-ochraceis (« burnt, yellow stone »), dein sordide ochraceis (pl. 12, 1-7, sed « Inca gold » vel « gold leaf » cum individualiter e latere observatae sint), serrulatis, confertis vel confertissimis, mediocriter vel sat latis (3-3.5 mm), ventricosis vel subtus applanatis, adnatis; sporis in cumulo albis. Stipite « khaki » ad apicem, « mummy » in parte centrali inferioreque, levi, subtiliter pruinatulo dein glabrescente, cylindraceo, 17-25 × 1-1.5 mm. Carne pallida, in strato corticali stipitis nec non in strato supralamellari pilei aquose fusca; odore nullo; sapore miti.

Sporis hyalinis, succo intracellulari subtiliter pallidissime roseolo impletis vel toto hyalinis, plerumque guttula globosa vel corpnsculo leucopigmenti amorpho hyalino praeditis, sat tenui tunicatis, levibus, inamyloideis, applanatione depressioneque suprahilaridestitutis, numerosissimis in carpophoris maturis, poro germinativo destitutis, 4.8-6.8 × 3.5-4.2 µ; basidiis tetrasporis, clavatis, hyalinis, 19-22 × 5.5-6.2 µ; cystidiis cheilocystidiisque nullis; tramate hymenophorali admodum regulari, ex hyphis parallelis, tenuibus crassisque pigmento dissoluto intracellulari purpurelloroseolo impletis consistente; epicute ex hyphis jacentibus, tenuibus, paulum pigmentatis, levibus consistente; hypodermio ex hyphis similibus pallide purpurello-roseis voluminosis elongatis consistente; hyphis omnibus haud amyloideis, fibulis destitutis.

Reactiones chimicae: KOH in stipite: « kis kilim ». $FeSO_4$ in omnibus partibus sine actione.

Ad latera fossae profundae prope radices bambusarum ad terram humidam gregatim sed haud fasciculatim. Rio Grande do Sul, Brasilia, n° B 27, LIL.

This is closely related to *Callistosporium luteoolivaceum* (Berk. & Curt.) Sing. but differs in the color of the pileus and the stipe, mild taste and habitat. The pigmentation of spores and basidia is also

weaker. This is certainly topotypic material of *Collybia luteoolivacea* sensu Rick, non Berk. & Curt.

Panus crinitus (L. ex Fr.). Sing.

This species is very common in Rio Grande do Sul, but its separation from *Panus schnyderi* (Speg.) is rather precarious at certain localities, and requires special studies. Our collection is no. B 35, LIL.

Pluteus riograndensis Sing. spec. nov.

Pileo fusco, glabro (nec rimosello nec rivuloso nec rimoso nec fibrilloso nec granulato), levi (centro haud venoso) sed ad marginem breviter sulcato (nec pectinato), convexo, obtuso, 17-18 mm lato. Lamellis roseis, ad aciem haud discoloribus, latis, ventricosis, liberis; sporis in cumulo roseis. Stipite albo, ad basin leniter aquose griseolo, levi, glabro, leniter attenuato apicem versus, 20-22 × 1.5 mm (ad apicem), 3 mm (ad basin). Carne alba, immutabili, inodora.

Sporis subglobosis vel geometrice fere globosis, paucis brevissime ellipsoideis, levibus, substramineis, variabilibus forma a 5.5 × 5.5 µ usque ad 7.2 × 5.7 µ, sed plerumque plus minusve 0.5-0.7 µ longioribus latitudine; basidiis 26 × 9 µ, tetrasporis, ventricosis; cystidiis prope et in acie lamellarum aut hyalinis aut succo cellulari fuscobrunneolo impletis, illis ab acie remotis semper hyalinis, numerosis ad aciem lateraque lamellarum, pedicellato-subulatis latissimis apice rotundatis, rarius vesiculosis vel late fusoideo-vesiculosis, levibus nec cornutis, 20-46.5 × 9.5-30 µ; epicute pilei cellulari.

In fossa in silva ad terram nudam, Rio Grande do Sul, Brasilia, no. B 31, LIL.

This species seems to be closest to what we determine as *Pluteus aethalus* (Berk. & Curt.) Sacc. In spite of the presence of colored cystidia on the edge, the latter is always concolorous with the sides of the lamellae. The shape of the cystidia is identical with that of *P. aethalus*. *Pluteus riograndensis* seems to be intermediate between *P. luctuosus* Boudier and *P. aethalus*.

Mycena, sect. **Basipedes**. aff. **mucor** (Batsch ex Fr.) Gill.

This specimen no. B 25, is apparently identical with Rick's *Mycena mucor*.

Pseudocoprinus disseminatus (Pers. ex Fr.) Kühner

On hard earth on the margin of the forest in large number, B 32, LIL. This species is extremely common all over South America.

Psathyrella candolleana (Fr.) A. H. Smith

This is the form with finely squamulose stipe and the grayish cinnamon young lamellae, common in the province of Tucumán (Argentina) and other regions of Southern South America, a large group of carpophores, on the ground in the forest, B 30, LIL.

Gymnopilus peliolepis (Speg.) Sing.

On dicotyledonous tree stumps, B 36, LIL.

Gymnopilus chrysopellus (Berk. & Curt.) Murr.

On dicotyledonous tree stumps, B 37, LIL.

Clitopilus septicoides (Henn.) Sing.

On living bark of *Guaria lessoniana*, B 34, LIL.

Rhodophyllus spec.

The species remains undetermined; this is no. B 29, LIL.

Gyrodon rompelii (Pat. & Rick) Sing.

This is topotype material, identical with the specimens sent to Farlow Herbarium by Rick (authentic), and with the specimens collected in the Province of Tucumán by Singer. A complete description of this species and a discussion of its mycorrhizal requirements will be found below (p. 129).

Aside from the Agaricales enumerated above, a *Deconica* spec., a « *Lepiota* » sensu lato, a *Clavaria* sensu lato, and some of the species already collected near Porto Alegre, were gathered, prepared, but not determined.

PARECÍ

Near the school for theological studies there is a hill with essentially original character of forest vegetation although bare and uni-

form Acacia woods approach closely the more original vegetation. The « omnivorous » *Pycnoporus sanguineus* (L. ex Fr.) Murr, was the only species observed by me occurring on Acacia wood; the ground under the trees was practically bare and no fungus development was visible. However, on top of the hill as well as near a small cascade on very humid soil, the collecting was good, and various species that must hare been observed or collected by Rick formerly as well as some species not observed in Rio Grande do Sul up till now were encountered and prepared. All specimens mentioned below were collected the 2nd of November 1951.

Clitocybe aberrantissima Sing. *spec. nov.*

Pileo aquose albo, hygrophano, albo in siccis, longe pellucido-striato in humidis, estriato in siccis, levi, circumferentia eliptica, diametro breviore directionem stipitis continuante, rarius circumferentia circulari, superficie haud viscosa, convexa dein applanata, dein concava praedito, umbilico leni ornato, 22-48 mm lato. Lamellis albis, sinuatis, adnexis, in siccis magis decurrentibus, interdum iam in vivis humidis lamellis dente decurrentibus, lamellulis rotundatis vel attenuatis intermixtis, acie denticulatis, circum stipitem subventricosis, sat latis (5 mm), rarius mediocriter latis, confertis; sporis in cumulo haud visis. Stipite albo vel albido, subpruinoso, glabrescente, levi, interdum canaliculato, aequali sed ad basin incrassato, plerumque excentrico obliquoque, solido, dein farcto, demum cavo, 17-41 × 2-8.5 mm. Carne alba, in strato corticali stipitis et supra lamellas linea aquosa praedita, inodora, haud tenaci.

Sporis subfusoideo-ellipsoideis, levibus, hyalinis, intus granulosis vel guttula unica rotunda interna praeditis, membrana sat tenui inamyloidea praeditis, applanatione suprahilari vel depressione lenissima praeditis, 7-5-10.2 × 4.8-5.5 µ; basidiis brevibus, clavatis, tetrasporis (paucis 1-2-3-sporis, in unisporis saepe sterigmate monstruose elongato) 20-21 × 6.8-7.5 µ; cystidiis ad latera et aciem lamellarum, ventricosis in parte inferiore, cylindrice effilatis in parte superiore, rarius iterum incrassatis in parte superiore (usque ad 7.5 µ), multis incrustatione viscidula hyalina praeditis, tenuitunicatis, hyalinis, quam basidia profundius ortis, 55-60 × 8-11 µ, parte effilato-cylindracea 4-5 µ in diam; subhymenio bene evoluto sed angusto, ex elementis elongatis tenuibus, brevibus, intertextis, densis consistente; tramate hymenophorali regulari, hyphis omnibus parallelis, multis insigniter latis (ut in Mycena) aliis tenuioribus, membrana tenui vel subtenui tunicatis, stratis haud differentiatis nec ullis divergentibus; epicute pilei paulum differentiata, ex hyphis hyalinis, filamentosis, levibus, repentibus, hyalinis, haud gelatinascentibus consistente; dermatocystidiis nullis; hyphis omnibus inamyloideis, haud gelatinosis, fibulatis.

Ad truncum vetustum in silva subtropicali, Rio Grande do Sul, Brasiliae, n° B 52, LIL.

This species differs from all other Clitocybes in having pleurocystidia. In addition, it is remarkable because of its pleurotoid habit which it shares with *Clitocybe pleurotus* Sing. from Tierra del Fuego (without cystidia). If the less decurrent lamellae are taken as a further character differentiating this species from Clitocybe, one may be permitted to single this species out and, in spite of some macroscopical differences, range it with *Clitocybe subulifera* Sing. and *Collybia pseudoclusilis* Konr. & Joss. The existence of cystidiate forms in the *Clitocybe-Collybia*-complex cannot be denied, yet further study of the cystidiate species will show whether or not they can be separated from their nearest relatives within the non-cystidiate sections of these genera.

Tricholomopsis araucariae Sing. spec. nov.

Pileo purpureo-squamuloso supra superficiem pallide flavidam (pl. 6, H-11 vel « Picadilly » ubi purpureus est), in umbilico atrovinaceo, e fibrillis spuamuloso, haud viscido neque hygrophano, convexo, demum umbilico leni ornato, 21-34 mm lato. Lamellis aeneis (« brass »), sed reflexis pallidioribus eluminatis, individualiter a lateribus visis stramineis (« straw »), subfimbriatis, mediocriter latis (usque ad 4.5 mm), confertis, adnatis; sporis in cumulo haud visis. Stipite flavido-albo, fibrillis eis pilei concoloribus sed admodum subtilibus lenissime flocculoso, subaequali, 30-35 × 3-5 mm; e maculo tomentoso albo ecrescit et tomentum basale paulum ascendit, hoc tomentosum album copiosum. Carne pallide flava, carnosa, inodora, miti.

Sporis hyalinis, inamyloideis, levibus, sat tenuiter tunicatis, depressione vel applanatione lenibus suprahilaribus praeditis vel destitutis, 7-7.3 × 4.2-4.5 µ; basidiis tetrasporis, clavatis 33-34 × 5.5-6.2 µ; cystidiis cheilocystidiis minoribus simillimis, e. gr. 40-55 × 8-10 µ, ad latera lamellarum moderate numerosis; cheilocystidiis (ut cystidiis) hyalinis vel rutilis, levibus, vesiculosis, longe pedicellatis, interdum submucronatis vel apice longe effilatis, rarius irregulariter vesiculoso-subcylindraceis vel late ventricoso-fusoideis, numerosis densisque et ex

eis acie lamellarum subheteromorpha (basidiis inter eis nullis), 45-95 × 9.5-20.5, plerumque cc. 65 × 15 μ; tramate hymenophorali admodum regulari, haud umquam ullo modo differentiato nec divergente, hyalino, ex hyphis subparallelis, mediocriter latis, multi-septatis, tenuitunicatis vel subtenuitunicatis consistente; epicute pilei ex hyphis filamentosis repentibus (raro hic illinc saccate dilatatis), numquam ascendentibus efformata; hypodermio ex hyphis magis pigmentatis latioribus efformatis, hyphis epicutis hypodermiique cutem efformantibus; hyphis omnibus inamyloideis, fibulatis.

Reactiones chimicae: NH_4OH ope in pileo exsiccato castaneo-tincto, guttula remota fuscata.

Ad truncum Araucariae brasilianae *in silva subtropicali, n° B 50, LIL.*

This is the first representative of the genus Tricholomopsis found South America.

Pleurotus ostreatus (Jacq. ex Fr.) Kummer

On a trunk of *Araucaria brasiliana,* B 51, LIL.

Panus rudis Fr. var **semirudis** Sing.

This grows on trunk of *Araucaria brasiliana,* and is identical with the material of the Rick Herbarium, called *Lentinus subglaber* Lloyd. The present collection is n° B 74, LIL.

Panus crinitus (L. ex Fr.) Sing.

These collections show transitions toward *P. schnyderi* (Speg.) Sing. B 77 and 78 are closer to *P. crinitus*, B 79 closer to *Panus schnyderi.*

Marasmiellus byssisedus (Bres.) Sing.

Pileus cinnamon (pl. 11, E-7) with light ochraceous center (pl. 10, E-5), but entirely white sericeous when young, and remaining white sericeous on the margin in adult caps, hygrophanous, white when dry, whitish in the center when dry, smooth, rarely transparently striate when wet, with involute margin, in age with lobed margin, convex with the center depressed since early youth, sometimes somewhat eccentric, 12-50 mm broad. Lamellae pure white at the zone of attachment to the stipe when young, otherwise cream color,

narrow (1-2 mm), irregularly deeply decurrent descendant, at times with some forked and anastomosing ones intermixed, close; spore print not obtained. Stipe initially pure white, then whitish to cream color, smooth, glabrous to slightly sericeous, subcartilaginous, stuffed, equal, ofen subeccentrically attached, 18-22 × 2-9 mm; basal tomentum forming a basal socle which is tomentose and pure white and the tomentum reaching to the middle of the stipe in many specimens. Context white unchanging; taste slightly bitterish; odor none.

Spores 4.2-5.5 × 2-4 μ, mostly about 5.2 × 2.8 μ, usually oblong to ellipsoid-subcylindrical, hyaline, smooth, with thin wall, with or without suprahilar applanation but without depression, nonamyloid, the broadest spores usually having their largest diameter near the lower third; basidia 17.5-22 × 3.5-6 μ, in this collection mostly 2-spored and one-spored, in the latter case the sterigma strongly elongated as in *Clitocybe aberrantissima* and *Omphalotus olearius,* and never seen to discharge spores; cystidia none; cheilocystidia basidiomorphous to filiform, very many of them with nodose outgrowths or diverticulate or ramified, rather fragile and densely packed and difficult to observe; subhymenium almost not differentiated; hymenophoral trama consisting of hyaline filamentous hyphae which have an axillar trend but are very strongly interwoven and thin-walled; epicutis of the pileus consisting of repent hyphae and their erect ramifications, all more or less diverticulate (but the diverticulation not quite easy to observe in some preparations), rather densely packed at least in the hypodermium where the hyphae are also horizontal-tangential and smooth; all hyphae with clamp connections and nonamyloid, with thin to somewhat thickened walls (up to 0.8 μ), 3-9 μ in diameter, not gelatinized.

Cespitosely on rotten roots and other woody matter in the forest, B 46, LIL.

This was compared with Rick, Fungi Austroamericani no. 47.

M. byssisedus is a good species of *Marasmiellus,* somewhat similar to *M. tropicalis* (Speg.) Sing. (with larger spores) and in habit recalling the species of *Trogia* which have different anatomical characters.

Marasmiellus incrustatus Sing.

This species which has also been observed in Argentina has been described by Singer & Digilio in *Lilloa* **25**: 153, 1951. The Brazilian material is no. B 60, LIL.

Marasmius silvicola Sing.

This species which has also been observed in Argentina, has been described by Singer & Digilio in *Lilloa* **25**: 199. 1951. The Brazilian material is n° B 53, LIL.

Marasmius fusicystis Sing.

This species which has also been observed in Argentina, has been described by Singer & Digilio in *Lilloa* **25**: 187. 1951. The Brazilian collection was on a dead branch of *Allophylus edulis*, B 54, LIL.

Hydropus riograndensis Sing. *spec. nov.*

Pileo sordide isabellino (« India buff » vel pl. 11 G-5), candido in margine extremo, fuligineo (« Santos », « biskra ») in centro, in juventute interdum toto albido-sordido, nigrescente, frequenter rugoso in parte centrali, levi in parte marginal sed transparenter striato in vetustis humidis, glabro, margine primum incurvato, convexo, obtuso, 8-22 mm lato. Lamellis albidis, saepe brunneolis (« tanbark ») versus trama pilei, demum pallide isabellinis (« Long Beach »), nigrescentibus, praesertim tactu, latiusculis vel latis (4 mm) subconfertis vel subdistantibus, saepe transversaliter venosis vel anastomosantibus, rotundato-adnexis ; sporis in cumulo haud visis. Stipite concolori centro pilei, nigrescente, ex toto subtiliter pruinosulo, levi, farcto demum cavo, aequali sed saepe curvato, centrali, 20-42 × 1.5-4 mm. Carne concolori superficiei, fractu nigrescente in stipite nec non in tramate lamellarum, succulento in his organis, odore fere nullo ; sapore miti.

Sporis hyalinis, levibus, amyloideis, ellipsoideis, membrana homogenea tenui et guttula centrali saepe amorpha instructis, 8-8.8 × 5.3-6.3 µ ; basidiis clavatis ; cheilocystidiis in parte inferiore ventricosis et in parte superiore subulatis, rarius filamentosis, apicem versus attenuatis sed rotundatis, hyalinis, numerosissimis in acie lamellarum sed basidiis perpaucis hinc inde interruptis, 45-52 × 7.5-9 µ, ad apicem tenuioribus ; pseudocystidiis cystidiis simillimis sed aut brunneis aut incrustatione amorpha praeditis et saepe in hyphas laticiferas prolongatis ; cystidiis ad latera lamellarum nullis sed prope aciem nonnullis cystidiis cheilocystidiformibus praesentibus ; tramate hymenophorali admodum regulari, ex hyphis filamentosis parallelis, hyalinis et ex hyphis laticiferis brunneis ramosis vel simplicibus distantibus sed numerosis efformato ; hyphis laticiferis in tramate numerosis, manifestis, vermiformibus, saepe furcatis, 5.5-8.5 µ latis, longissimis ; epicute pilei e dermatocystidiis subhymeniformiter dispositis versiformibus consistente ; dermatocystidiis plerumqueventricoso-saccatis, interdum ad apicem sinuatis vel mucronatis subampullaceisque, perpaucis filiformibus, semper levibus vel perpaucis excrescentiis irregularibus obtusis ornatis, haud diverticulatis, interdum spatium hypodermii nudi exponentibus, rarissime perpaucis dermatopseudocystidiis pseudocystidiis hymenii analogis in epicute pilei intrusis, dermatocystidiis typicis magnitudine variabilibus, e. gr. 34 × 16 µ ; hypodermio ex hyphis repentibus cutem efformantibus filamentosis consistente ; hyphis omnibus inamyloideis, fibulatis.

Ad truncum arboris dicotyledoneae in silva subtropicali gregatim, Rio Grande do Sul Brasiliae, B 68, LIL.

This species is closely related to *Hydropus fuliginarius* (Batsch ex Weinmann) Sing. It differs in the much larger spores. Rick knew it as *Collybia atramentosa*. The Rio Grande species differs from *Mycena umbrina* A. H. Smith by the cheilocystidia which are absent in Smith's species, and from *Mycena brevipes* (Murr.) Murr. by the absence of pleurocystidia, longer stipe, and less crowded lamellae. The rugose disc reminds one somewhat of *Hydropus marginellus* (Pers. ex. Fr.) Sing. var. *rugosidiscus* (Peck) Sing. and it is as inconstant, or more so, than in the northern species.

Polyporus dermoporus Fr.

This is my no. 62, on rotten wood, LIL.

Pseudofavolus cucullatus (Mont.) Pat.

This species, common from Florida to Argentina, grows on rotten wood of a dicotyledonous tree, B 63, LIL. The spores are about 13 × 5.5 µ, hyaline, smooth, nonamyloid; subhymenium conspicuous, somewhat gelatinized, seemingly cellular; hymenophoral trama subirregular with strongly interwoven hyphae which show no more than a vague axillar trend; hyphae thickwalled and occasionally solid, nonamyloid. The basidia are large and much like those of *Lentinus sulcatus* Berk.

Lepiota spec.

An undetermined species of this genus, B 66, LIL.

Agrocybe aegerita (Brig.) Sing.

Fasciculate specimens grew 3 m high on the trunk of a living *Cupania vernalis*. It differs from other specimens in being more white in the marginal two thirds of the pileus. The specimens need further study, B 55, LIL.

Deconica spec.

A very characteristic tubarioid *Deconica* on small chips on a very wet spot showing strikingly triangular spores was collected near the small cataract in deep shade, B 71, LIL.

Galerina arenaria Sing. spec. nov.

Pileo brunneo («burnt umber»), hygrophano, in siccis dilute ochraceo-brunneolo, rarius subolivaceo («fox») transparenter striato in humidis, estriato in siccis, glabro, convexo, dein applanato, semper papilla exigua sedprominente ornato, 7-12 mm lato. Lamellis brunneis («buckthorn br.» vel «chipmonk»), moderate confertis, latiusculis, adnatis; sporis in cumulo haud visis. Stipite pileo concolori, infra annulum sericeo, ad basin incrassato, superne aequali, 23 × 1.5 mm; annulo subdistante, subpersistente, subconcolori. Carne subconcolori, inodora, fragili.

Sporis grosse verrucosis, verrucis obscure ferrugineo-ochraceis supra episporium ochraceum, ellipsoideis, disco levi bene limitado suprahilari ornatis, 7.5-9.7 × 5.5-6.3 µ; basidiis (mono- vel) bisporis, clavatis, hyalinis, 19-26 × 6.8-7.8 µ; cystidiis ad latera nec non ad aciem lamellarum aequalibus, semper membrana tenuiuscula instructis, facile collabentibus, interdum incrustatione tenuissima ochracea vel subhyalina ad apicem obtectis, in parte infcriore ventricosis, in parte superiore plerumque late breviterque mucronatis, rarissime mucrone destitutis, raro anguste mucronatis, raro subcapitato-mucronatis, membrana hyalina instructis, moderate numerosis ad latera, numerosis ad aciem sed hic basidiis saepe interruptis, 27-54 × 11-13 µ; tramate hymenophorali regulari, ex hyphis elongatis sed latis, pigmento aliquantulum incrustatis consistente; hyphis epicutis pilei elongatis repentibus, pigmento aliquantulum incrustatis; hyphis hypodermii latioribus, magis pigmentatis, cutem formantibus; hyphis omnibus fibuligeris.

Ad terram arenosam, humidam fontis silvestris loco umbroso in silva subtropicali, gregatim, sed haud caespitose, Rio Grande do Sul, B 70, LIL.

This species differs from other species of Stirps Marginata of section Naucorioides Kühner in the combination of the following characters: Small pileus, well developed annulus, small spores, bisporous basidia, abrupt papilla, ventricose-mucronate cystidia, absence of pruinosity on the stipe, habitat on naked sandy soil. The veil is not greenish and the odor practically absent.

Galerina minor Sing. spec. nov.

Pileo ochraceobrunneo, hygrophano, glabro, substriato, pellucide striato in humidis, convexo vel conico, plerumque papilla manifesta praedito, 2-3 mm lato. Lamellis ochraceobrunneis, distantibus, ventricosis, adnatis; sporis in cumulo haud visis. Stipite ochraceobrunneo, appresse fibrilloso, exannulato, apice pallidiore in nonnullis carpophoris, subaequali, 7-8 × 0.5-0.7 mm. Carne exigua, subinodora, fragili.

Sporis amygdaliformibus vel amygdaliformi-ellipsoideis, bene coloratis, fortiter verrucosis, disco nudo bene circumscripto suprahilari praeditis, 8.2-9.5 × 5.5-6.6 µ; basidiis bisporis, rarius 1-3-4-sporis, clavatis, 26-27.5 × 6.8-7.5 µ; cystidiis ad latera et aciem lamellarum sparsis, plerumque apice capitatis, in parte centrali ventricosis, aliis ampullaceis pedicellatisque, tenuitunicatis, facile collabentibus, hyalinis, nonnullis hyalino-brunnescentibus, 28-44 × 8-15 µ, apice in ampullaceis 5.5-7 µ lato, capitulo in capitatis 6.8-11 µ diam; cheilocystidiis pedicellato-vesiculosis, sat numerosis marginem pilei versus; tramate hymenophorali regulari, ex hyphis elongatis, voluminosis, multis ex eis pigmento ochraceobrunneo incrustatis consistente; strato cuticulari pilei ex hyphis pigmento incrustatis cutem efformantibus consistente; hyphis omnibus fibulatis.

Ad lignum putridissimum inter Hepaticas *loco umbroso in silva subtropicali. Rio Grande do Sul, B 65, LIL.*

This differs from the preceding species in the absence of an annular veil, the presence of vesiculose cheilocystidia, smaller size of pileus and stipe, more distant lamellae and the habitat. It differs from *G. physophora* Sing. in much smaller size, more distant lamellae, absence of an annular veil.

The surprise of our collecting in Brazil, and for that matter in Argentina, was the large number of species of *Galerina*, many of them undescribed, which had escaped our predecessors. Not only do they occur in regions with a climate more reminiscent of the boreal climate of Northern North America and Europe where most of the species known until then occur, but they are likewise common,

especially in spring and fall, in the montane rain forests and in the subtropical rain forests both in North Argentina and South Brazil. One species was discovered in the barren soils of the Chaco formation after unusually heavy rains. All this seems to confirm our earlier statement that, of all the *Cortinariaceae, Galerina* seems to be the genus most highly developed, most adaptable to specific conditions, and showing the most striking variation in combinations of macro- and microscopical characters.

Crepidotus uber (Berk. & Curt.) Sacc.

Pileus whitish, then becoming stramineous and eventually ocher brown in the rear portion, also often with brown marginal zone, hygrophanous, white when dry and young, later paler stramineous respectively paler ocher brown than in the wet stage, glabrous or white-woolly at the rear base, transparently striate in the marginal zone when wet and striation often seen even in dried material, smooth otherwise, not viscid, ostreate to rarely subcircular, broader than long, 7-25 × 5-12 mm. Lamellae white then argillaceous, eventually color of the ordinary Crepidotus spore print, moderately broad to very broad (1.7-5 mm), moderately close, sometimes subdistant, frequently distinctly ventricose, concurrent towards a lateral point; spore print same color as in the entire Mollis-complex. Stipe none; there is a lateral extension of the pileus noticeable in some caps and this may appear stipe-like from above, but there never is any definite stipe when seen from below and the pileus is sessile to subsessile. Context watery-white, dry white, no definite gelatinous zone seen macroscopically; odor none; taste mild.

Spores 7.5-9 × 4.8-6.2 μ, rarely in some preparations spores up to 9.5 μ long and up to 7.5 μ broad observed, smooth, brown, ellipsoid to amygdaliform, without a mucro and without a germ pore, even without a callus; basidia mostly all 4-spored, more rarely (if there are very large spores intermixed) a few bisporous, not distinctly clavate, hyaline, 26-27 × 6.8-7.5 μ; cystidia none on the sides of the lamellae; cheilocystidia not clearly differentiated, the edge of the lamellae consisting of septate hyphal ends which are versiform but usually thin and inconspicuous; hymenophoral trama regular, somewhat (slightly) gelatinized; epicutis of the pileus hardly differentiated in some preparations, in others consisting of clearly differentiated clavate brownish hyphal ends forming a fragmentary trichodermium, evidently forming an intermittent and fugacious layer, beneath it a

hyphous zone which becomes gradually more and more gelatinized, the uppermost portion of this being the hypodermium, the gelatinized zone the infra-cuticular layer, the latter becoming gradually less gelatinized near the subhymenium of the lamellae (supralamellar layer) and the trama proper of the pileus is strongly reduced to absent; the dividing line between the non-gelatinized and the gelatinized zone of the pileus is absent and the transition is gradual; hyphae of the basal tomentum (where well developed) very slightly thicker-walled than in the trama, and also in comparison to the cuticular layer, hyaline or subhyaline, filamentous, with rather scattered septa, all without clamps; all hyphae nonamyloid without clamp connections.

On woody parts of plants, such as fallen branches of both mono- and dicotyledonous trees, on fallen palm sheaths, etc. but most frequentlly on wood of Nectandra, in the north also on *Quercus virginiana,* at times on Citrus, and more rarely on Ficus, only in the warmer regions of North America (Florida) through the West Indies and Northern, Central and Southern South America (to South Brazil). Our collection; B 47, LIL.

This was compared with fresh material collected by me in Florida, and with dried material of the type from the Bonin Islands and of various American collections. This is a thermophilous species, differing from most other species of the Mollis-complex in the characters of the lamellae, margin of the pileus, and most clearly the epicutis, and in the lack of sharply limited gelatinous zones in the context of the pileus as well as the wide extension of the gelatinization whereby the trama proper of the pileus is almost suppressed. Rick used to collect this under the name *Crepidotus brasiliensis.* Murrill called it *Crepidotus sulcatus.*

Crepidotus palmarum Sing.

This species which is described fully by Singer & Digilio in *Lilloa* **25**: 406. 1951, has thus far been observed only on petioles of *Arecastrum romanzoffianum;* being specialized on this single host, *C. palmarum* is apparently too strong a competition for the preceding species on this particular habitat, and therefore, *C. uber* never occurs on palms in Rio Grande do Sul, but rather exclusively on dicotyledonous wood. My collection in Brazil is no. B 48, LIL.

Clitopilus septicoides (Henn.) Sing.

This is one of the specimens with a slight grayish hue on the lamellae, the pileus being white. On mossy stones, on bark of *Trichilia elegans* and *Allophylus edulis,* B 69, LIL.

Rodophyllus squamifolius (Murr.) Sing.

A complete description of this species is being published in a forthcoming paper by Singer & Digilio. The species seems to be restricted to ferns. All collections (West Indies, Florida, Mexico, Argentina) have hitherto been on *Pteridophyta,* and the collection at Parecí, Rio Grande do Sul, is likewise on a Pteridophyte (*Blechnum* spec.), B 64, LIL. The fact that this species was found in one of the classical collecting places of Rick suggests that he may have known this characteristic species. Indeed, among the descriptions of his « Agarici Riograndenses » there is one that most certainly belongs here *(Inocybe megalospora* Rick), the leaves and sticks on which this has been found probably being of pteridophytous origin; *Leptonia brunneogrisea* Rick may also be this species. Murrill had misinterpreted it as a species of *Crinipellis.*

Gyrodon rompelii (Rick & Pat.) Sing.

Pileus « burnt umber », or « cowboy » mixed with « chukker br. » also merely « cowboy », subvelutinous, or subtomentose, glabrescent and giving the feeling of « kid », often finely and distantly granular, smooth, with acute margin, dry (not glutinous), pulvinate-convex, then convex-applanate, eventually sometimes with slightly depressed center, 32-108 mm broad. Hymenophore tubulose, the tubes concolorous or almost concolorous with the pores and usually more or less bluing when bruised, short (3-8 mm) attenuate gradually at the stipe and at the lower margin of the pileus where they are transformed into a fine network (but not always), arcuate or almost arcuate, decurrent to very deeply decurrent; pores wide and boletinoid, the tramal walls of the highest level always at least 1 mm apart, usually more, with lower anastomosing tramal walls, very compound, « light chrome yellow », « tennis », « old bronze » (depending on age), bluing where touched at least when young and fresh; spore print between « citrine » and « old bronze ». Stipe « light chrome y. » in the upper portion and as a ground color in the lower where it is beset with

extremely fine granules which are « pompeian r. » so that the entire lower portion of the young stipe gives the impression of being pink, later, because of darkening by autoxidation and by spore fall becoming « cowboy » in the upper and central portion, the pink eventually disappearing, and the very base often olive brown, originally with a very fine network in continuation of the spores in the upper (yellow) half of the stipe, but later the network becoming indistinct, subvelutinous or glabrescent in the lower portion after the granulation has become obsolete, and then the originally yellow and pink zones merely separated by a red (pl. 5, I-11 to « cauldron »), ring-like zone in the middle or on the apex of the stipe which is solid, equal, tapering downwards, or slightly tapering upwards, 32-100 × 11-33 mm. Context yellow (pl. 9, E-2 to F-2), bluing, in age often not bluing and whitish yellow, the upper portion of the context of the pileus often pinkish and unchanging in old specimens, the lower portion of the context of the stipe often light leather brown to cinnamon and unchanging to slowly bluing in old specimens, soft-fleshy; odor none; taste mild.

Chemical characters: KOH on context before autoxydation: alutaceous, afterwards: ocher brown; on surface of pileus: much deeper; on the pink portion of the surface of the stipe: bux yellow, then chestnut. NH_4OH similar color changes, and on pores becoming sordid or brownish.

Near *Sapindaceae* in subtropical forest on earth or on the ground of the trunks, singly or in small groups, spring and early summer, Brazil and Argentina, our Parecí collection no. B 41, LIL.

A comparison between this description and the description of *Gyrodon proximus* Sing. (see *Farlowia* **2**: 244. 1945) and *G. meruloides* (Schwein.) Sing. (see *l. c.* p. 247) shows clearly that the three species are different. The two last named species lack the pink of the young stipe and have evidently other mycorrhizal connections since in all of the localities where *G. rompelii* has been found thus far, *Fraxinus* or even related genera were absent. This statement can be made with confidence since at our locality in the Selva Tucumano-Boliviana, on the Sierra de San Javier, as well as in São Leopoldo and near Parecí the entire forest flora was analyzed, with the result that, among the traditional mycorrhizal families only once a tiliaceous species was represented (*Luehea divaricata*) while tiliaceous trees occured on San Javier outside a radius of 10 m around the carpophores, i. e. they could not possibly be responsible for the ocurrence

of this species. However, the trees always present at all localities were sapindaceous trees, *Allophylus edulis* and *Trichilia elegans,* the former being present in all localities, the latter in all but one. At Parecí, the carpophores grew attached to the ground of both the *Allophylus* and the *Trichilia,* and following the mycelium, it was obvious that this was attached to roots of *Allophylus edulis* and *Trichilia elegans.* A section of these roots still shows the presence of clamped basidiomycetous mycelium. Thus, field observations in subtropical South America reveal another, essentially new relation between *Boletaceae* and *Cormophyta,* a mycorrhizal relationship with a family thus far unknown as mycorrhiza-host of Basidiomycetes, the *Sapindaceae.* The observations are exact and specific enough to serve as basis for experimental studies on the subject.

Aside from the species mentioned above, the collecting at Parecí also included various Gastromycetes *(Lycoperdaceae),* Ascomycetes (Discomycetes), an immature species of *Hohenbuehelia* on Araucaria, and numerous polypores, including again the common *Polyporus tricholoma,* furthermore *Lachnocladium brasiliense* and two species of Hydnaceae and two Porias; *Pseudocoprinus disseminatus* (Pers. ex Fr.) Kühner was observed repeatedly.

ESTAÇÃO SÃO SALVADOR

At the Estação São Salvador, we visited the westernmost and at the same time most untouched sample of the original forest vegetation of this part of Rio Grande do Sul. One day of collecting there, in company of Father Rambo and Father Sehnem, 9th of November 1951, resulted in the listing of 24 species. In addition, a few specimens collected there before that date by Father Sehnem are included in the following account.

Collybia subfumosa Speg.

Pileus radially fibrillosely streaked with cinnamon fibrils which are innate, very little hygrophanous and merely slightly paler cinnamon when dry, never white at the margin, coarsely and irregularly but strongly furrowed or sulcate at the margin, otherwise smooth, convex, later depressed around a low umbo, usually up to 60 mm broad, but some smaller caps are observed in most groups.

Lamellae gilvous-whitish, eventually cinnamon, adnate, narrow, crowded or close, anastomosing, narrowly to broadly adnexed, inserted, didymous to tridymous; spore print not obtained. Stipe sordid-pallid velutinous on light fuscous ground, near the base coarsely cottony-woolly and soft-elastic, smooth or slightly furrowed above, equal or tapering upward, subcartilaginous and stuffed, 60-85 × 5-10 mm. Context paler than the surface, not very fragile, with odor of HCN, but soon inodorous.

Spores hyaline, nonamyloid, smooth ellipsoid, 7.4-7.7 × 4-4.3 μ; basidia 2-4-spored, 37 × 7 μ; cystidia none; subhymenial hyphae, where they are reaching the surface (at the edge and at places where the hymenium has disappeared) small and extremely irregular, sometimes slightly ramified or with short outgrowths, but not clearly diverticulate; epicutis of the pileus consisting of hyaline to brownish hyphae which are in general repent and smooth but some side branches of these hyphae suberect and sometimes somewhat diverticulate, or the repent hyphae directly but sparingly and irregularly diverticulate at places, these diverticulations less distinct in young and fresh material; hypodermium consisting of broader hyphae which are brownish with a membrana pigment which is pale brownish melleous but without distinct incrustation; all hyphae nonamyloid, with clamp connections.

On leafmold and very rotten wood in subtropical forest, B 115, LIL.

This collection, probably conspecific with *Collybia confluens* in the sense of Rick and perhaps with *Marasmius archyropus* var. *leopoldinus* Theissen is somewhat similar to *Marasmiellus fascicularis* Rick ex Sing. although it is markedly larger and more sulcate, more intensely colored, with a distinct odor of HCN, and without demonstrable pleurocystidia. The diverticulation of some cheilocystidia and some hyphae of the epicuticular layer seems to be characteristic of old specimens rather than of the species as such, and therefore, it has been left in *Collybia* although this species and *Marasmiellus fascicularis* seem to be the two points where *Collybia* and *Marasmiellus* come closest to each other. As for the specific name of the species, I accept Dennis' interpretation of the type of *Collybia subfumosa* Speg. (see *Trans. Brit. Myc. Soc.* 34: 448. 1951). Dennis has discovered the type of the species which I was, at the time, unable to find at LPS, and identifies it with material he has collected in Venezuela and Trinidad as well as with Jamaica material of Murrill's published as *Gymnopus monticola* Murr. (type). It is true that the spores obser-

ved by Dennis reach 9 μ in length and 5 μ in breadth, but it is quite probable that my species in carpophores with more abundant sporulation forms spores larger than those observed by us which still perfectly fit in the spore size given by Dennis. There is only one problem: Spegazzini finds the lamellae — as we do — «confertae»; Murrill says they are distant. Spegazzini gives them as 1 mm broad i. e. narrow (as in our material); Dennis indicates 7 mm wide.

Armillariella puiggarii (Speg.) Sing. forma **olivacea** (Rick) Sing.

Pileus olive melleous, tending to become rimose on the margin, distinctly squamulose, dry, convex, eventually depressed or subumbonate in the center, 16-30 mm broad. Lamellae creamy white, arcuate, decurrent, subclose to subdistant, broad (to 5 mm); spore print pire white. Stipe from base to apex gradually lighter, from black to cinnamon white, solid, flexuous, appressedly silky-fibrillose, equal, 35-50 × 2 4 mm; annulus persistent, well developed, apical, white or whitish, thick, smooth. Context pallid; odor none; taste slightly and slowly astringent, but decidedly not so mild as in the type form.

Microscopical and chemical characters as in the type form (see description by Singer, *Lilloa,* **23**: 171. 1950, and in Singer & Digilio, *Lilloa* **25**: 71. 1951, from Argentine material).

This form differs slightly from the smaller form of the type form in having a more olivaceous hue on the pileus and slightly astringent taste.

It was found growing fasciculately on the basis of frondose trees in subtropical forest, no. B 117, LIL.

Oudemansiella canarii (Junghuhn) Höhnel.

This is very common near São Salvador, no. B 114 on various dicotyledonous trees, varying from white to porphyry gray. See also note on this fungus on p. 67 and p. 113.

Heimiomyces tenuipes (Schwein.) Sing.

The form observed here corresponds partly to the form described from mainly Brazilian material in *Lloydia* (**5**: 127. 1942). This is our present collection B 113 *a,* LIL. Another collection differing mainly in the broad, distant lamellae is here described separately although

it is not felt that it is distinguishable on the specific level; however, further investigations might be desirable to prove this.

Pileus fulvous with a fine hyaline bloom, sulcate and besides transparently striate up to over four fifths of the radius, with rugose disc, convex, obtuse, sometimes umbonate, reaching 81 mm in diameter. Lamellae whitish yellow, more yellow at edge, reaching pl. 9, K-1 at the edge, the shades pl. 9, L-3, distant, with ladder-like venose anstomoses, up to 19 mm broad, i. e. very broad, broadly ventricose, intermixed with regnlarly interspersed lamellulae, rounded-adnexed; spore print pure white. Stipe chestnut brown to deep olive ferrugineous-fulvous, strongly velutinous, stuffed, becoming hollow, smooth, in age sulcate, tapering downward, up to 90 mm long and up to 19 mm broad, usually slightly eccentric. Context light yellow with a deep fulvous layer immediately underneath the center of the pileus, at insertion zone of stipe in pileus, as well as in the entire stipe, chestnut brown, unchanging, fleshy in the pileus; odor pleasant, apple-like as in *Flammulina velutipes* (Curt. ex Fr.) Karst.; taste mild.

Microscopical and chemical characters as in the form with narrower (up to 7 mm) closer lamellae, entirely yellow flesh, solid stipe and deeper colored pileus («Mandalay», reaching «cocoa» when mature).

On rotting wood in subtropical forest, no. B 113, LIL.

This form is suspected to be merely the old stage of the «normal» one, i. e. the one that is usually found in the herbaria. Rick distingnished the form with the broad lamellae, described above, as *Collybia rheicolor.*

Heimiomyces pruinatipes Sing. in Singer & Digilio in *Lilloa* **25**: 243. 1951.

This species was originally described from the Selva Tucumano-Boliviana in Argentina. The specimens collected at São Salvador could only be determined thanks to this previous experience with the species since all fruiting bodies were sterile. This is no. B 121 on dicotyledonous trunk in subtropical forest.

Mycena spec.

An undetermined species of *Mycena,* strictly omphalioid, and occurring in large numbers, B 120. LIL.

Filoboletus gracilis (Klotzsch in Berk.) Sing.

This species was described from material collected in Florida, with data also taken from Brazilian material collected by Rick and deposited at the Farlow Herbarium (see Singer, *The* Laschia-*complex (Basidiomycetes). Lloydia* **8**: 216. 1945). Fresh material was gathered here, no. 125, LIL.

The form with wider pores (in the typical form they are up to 0,7 mm. wide) and a more « boletinoid » arrangement also occurs in Rio Grande do Sul but was not observed here in fresh condition. It is what Hennings called *Favolaschia staudtii* Henn. It is not quite certain whether this is a separate species or merely a variety.

Polyporus aff. **brumalis** (Pers. ex) Fr.

On sticks from dicotyledonous trees, no. B 118, LIL.

Mycobonia flava (Berk.) Pat.

On trunks of dicotyledonous trees, no. B 135, LIL.

Panus crinitus (L. ex Fr.) Sing.

On fallen branches and dead wood of dicotyledonous trees, with transitions to *P. schnyderi* (Speg.) Sing., no. B 131, B 132.

Lepiota spec.

On dead trunk in subtropical forest, B 129. This is entirely white, with pseudoamyloid spores and the epicutis in form of a cutis; clamp connections none; hymenophoral trama irregular.

Coprinus spec.

An undetermined species of *Coprinus* on wood, B 130, LIL.

Pluteus umbrinoalbidus Sing. spec. nov.

Pileo fuligineo vel dilute sordide fusco, cuticula saepe minute rimulosa praedito vel unilateraliter paulumque radiato-rimosulo, interdum lenissime sulcatulo (independenter rimositate), velutino glabrescente et tunc pallidius colorato hygrophanuloque et in siccis umbrinopallido, convexo

margine subverticali, aetate convexo-subumbonato vel depresso-umbonato, 13-20 mm lato. Lamellis albis dein roseis, latis, confertis, liberis. Stipite albido vel albo, subtiliter fibrilloso dein sericeo, glabrescente, demum longitudinaliter striatulo, aequali vel apicem versus attenuato, 15-23 × 1-2.5 mm. Carne alba vel albida, immutabili, inodora.

Sporis subcrasse tunicatis, levibus, roseostramineis, brevissime ellipsoideis, 5.5-6.8 × 5-6 µ; cystidiis ad aciem lamellarum ventricoso-vesiculosis vel globuloso-vesiculosis vel clavato-vesiculosis, numerosis vel sparsis, ad latera lamellarum ventricoso-vesiculosis vel ampullaceo-vesiculosis, minus numerosis quam in acie, omnibus cystidiis hyalinis, levibus, subpedicellatis, excrescentiis destitutis, late rotundatis, 30-47 × 11-17 µ; tramate hymenophorali distincte manifesteque inverso; epicute pilei cellulari, ex elementis globosis vel clavato-vesiculosis stratum hymeniforme efformantibus consistente; pigmento intracellulari in multis elementis epicuticularibus praesente, dissoluto fuscidulo vel e corpusculis amorpho-subvermicularibus consistente; hyphis omnibus tramatis hyalinis, fibulis haud visis.

Ad lignum putridum arboris dicotyledoneae in silva densissima subtropicali, B 110 et B 124 (typus), LIL.

This species is closely related to *Pluteus tucumanus* Sing. in Singer & Digilio from which it differs in not having the margin regularly rimose and split all around in the Inocybe manner, in less ellipsoid (yet not globose) spores. It is very similar to young specimens of *P. tucumanus* and difficult to distinguish from it before the spores have been formed.

Pluteus viscidulus Sing.

This species, described from the province of Tucumán, also occurs in Rio Grande do Sul, no. B 111, LIL, on rotten wood in subtropical forest. A complete description is given in Singer & Digilio, *Lilloa* **25**: 253. 1951, Argentine Agaricales, It is almost certain that Rick determined this as *Pluteus pellitus*.

Agrocybe aegerita (Brig.) Sing.

This is again a more whitish form, otherwise quite typical, as it seems, growing on an undetermined dicotyledonous tree, B 109, LIL.

Crepidotus (?) spec.

This collection (B 127, LIL) lacks a spore print and was found

only in one carpophore. A safe determination cannot be given. It grew on an old log in subtropical forest and was macroscopically remarkable by a well developed eccentric stipe, thoroughly white color, and crowded free lamellae. The spores are remarkable by being extremely variable as well in ornamentation as in shape, and they are almost hyaline when seen separately, but distinctly light brownish when seen in accumulations. It is even possible that it is not a Crepidotus.

Crepidotus croceotinctus Peck

Pileus « light ochraceous buff » (Ridgway) with the dorsal portion often « ochraceous tawny » (Ridgway), or (in the Brazilian collection) « buff » with paler appressed fibrillosity all over, even vellereous, usually with yellowish white basal tomentum on the upper side of the basal portion, convex, 10-42 × 6-26 mm (in Brazil 10-19 mm in diameter). Lamellae yellow (pl. 9 K 7), then argillaceous, moderately broad (3.5 mm) to broad, moderately close to close, concurrent to the lateral base or to a rudimentary stipe; spore print not obtained. Stipe nome, or rudimentary, and than tiny and concolorous with the lamellae, or with the pileus. Context whitish, not gelatinized but with a watery line above the lamellae when wet, the cuticular layer also marked with a watery layer, snow white between the two watery layers, white to whitish when dry, inodorous.

Spores pale tan with bright rust colored spinules imbedded in the episporium, the spinules very short and making the spores appear punctate when they are focussed upon the upper side, instead of in optical section, somewhat roughish because the spinules project very slightly, shape of a droplet to broad-ellipsoid, with a slight suprahilar applanation or depression, 6.2-8 × 4.8-6 µ; basidia 31 × 8.8 µ, 4-spored; cystidia none; cheilocystidia rather bizarre in shape, usually filamentous or terete curved, but sometimes with a ventricose swelling, or with two swellings one in the middle and one at the apex, always curved underneath the apical swelling, the latter often making the cystidium capitate and mostly marking the broadest portion of its entire length, sometimes with strange excrescencies, hyaline, making the edge of the lamellae heteromorphous, 35-43 × 7.5-9 µ; hymenophoral trama hyaline, rather regular in a mature carpophore, consisting of two kinds of hyphae, one short and swollen, rather broad, the other thin and filamentous, somewhat interwoven;

epicutis of the pileus consisting of occasional tufts of inconspicuous versiform dermatocystidioid hyphal ends which are subhyaline under the microscope and form a fragmentary trichodermium; trama of the pileus hyaline, consisting of horizontal cylindrical hyphae which are never gelatinized; all hyphae with clamp connections.

On dead wood of a dicotyledonous tree in subtropical forest, B 122, LIL.

This was compared with material collected by me in Florida, USA (Highlands Hammock State Park, August 21, 1942 on dead dicotyledoneous tree — perhaps *Quercus* — FH) and with the type of the species (NYS).

Galerina subbullulifera Sing. spec. nov.

Pileo melleo (pl. 11, I-7), hygrophano, in siccis pallide flavido, in humidis transparenter striato et sulcato in zona angusta (2 mm) marginali, convexo, papillato, glabro, 13 mm lato. Lamellis luteobrunneis (« spruce y. »), magis flavis ad aciem, mediocriter confertis, mediocriter latis, adnatis. Stipite luteobrunneo (« spruce y. ») ad apicem, avellaneobrunneo (« hazel ») infra annulum, fibrillis pallidis applicatis subsericeis, aequali sed ad basin bulboso, 27 × 1 mm, ad basin 4 mm lato; annulo luteobrunneo (« spruce y. »), angusto, sat persistente. Carne subconcolori pallidiore, fragili, inodora.

Sporis bene pigmentatis, subtiliter punctulatis, disco levi suprahilari bene evoluto et delimitato ornatis, nonnullis interdum subauriculatis, subellipsoideis, 8.2-9 × 5-5.5 µ; basidiis tetrasporis, plerumque subclavatis, hyalinis, 23-23.5 × 6.8-8.2 µ; cystidiis ad latera atque in acie lamellarum praesentibus, globoso-vesiculosis et pedicellatis, ad aciem haud mucronatis, numerosis, 19-28 × 9.5-12.3 µ, ad latera minus numerosis, mucronatis et ex eo plerumque subampullaceis, tenuitunicatis hyalinis, 27-37 × 9.5-13.7 µ; tramate hymenophorali regulari, ex elementis hyphosis latiusculis breviusculisque sat crasse tunicatis, flavis, haud incrustatis consistente; epicute pilei hyalina, ex hyphis repentibus, tenuitunicatis, filamentosis, levibus consistente; hypodermio magis colorato (flavo) quam trama pilei, ex elementis latioribus haud incrustatis consistente; margine pilei extremo ex hyphis terminalibus tenuitunicatis, cystidioideis, hyalinis, clavatis consistente; tramate pilei ex hyphis radiatim dispositis subparallelis vel subirregularibus consistentibus, earumque elementis saepe breviusculis latiusculisque; praeparationibus hymenophoralibus semper omnino flavis (vel citrinis) ex pigmento dis-

soluto pigmentum multorum Gymnopilorum in mentem revocante; hyphis omnibus fibulatis.

Solitario ad lignum dicotyledoneum in silva subtropicali, B 126, LIL.

This species reminds one of *Galerina bullulifera* Sing. from which it differs in the presence of vesiculose mucronate to subampullaceous pleurocystidia and absence of pigment incrustation in the hyphae, in lighter colors, and other minor characters.

Rhodophyllus spec.

An undetermined species of this genus, no. 123, LIL, was found in subtropical forest.

Lentinus puiggarii Speg.

This species was collected by A. Sehnem n° 7966, July 8, 1946, det. R. Singer, LIL. It belongs in the section Squamosi where it is closely related to *L. cubensis* Berk. & Curt. A detailed description will be given in a forthcoming paper.

Pleurotus hirtus (Fr.) Sing.

This species was collected by Sehnem, n° 1976, February 2, 1946, det. R. Singer, LIL. The type of this species has been studied by Singer at Uppsala. It is common in Cuba and south to Brazil, Paraguay, Perú, and Chile.

Crinipellis macrosphaerigera Sing. spec. nov.

Pileo ochraceo-stramineo-brunneolo in siccis, subtiliter piloso crinibus appressis, centro punctiformi glabro nigro, 8-16 mm lato. Lamellis in siccis subconcolori pileo sed in vivis possibiliter albis, mediocriter latis, distantibus, anguste adnexis. Stipite concolori, piloso, centrali, aequali 10-25 × 1-1.3 mm. Carne albida.

Sporis globosis vel latissime ellipsoideis, membrana moderate tenui hyalina levi inamyloidea instructis, angulose collabentibus, 12.3-13.8 × 9.5-11.7 µ; basidiis voluminosis, clavatis, tetrasporis, 46-72 × 13.7-16.5 µ; basidiolis anguste clavato-subcylindraceis; cystidiis nullis in specimini-bus juvenilibus, demum sparsis cystidioliformibus, ventricosis, apice attenuatis, hyalinis, e. gr. 35 × 9.5 µ; cheilocystidiis melleis vel sub-hyalinis in siccis, arboriformibus, ramosis ad apicem tantum vel a media longitudine, ramis erectis duobus vel multis acutis vel frequentius

cylindraceis rotundatisque 4-15 µ longis ornatis, 34-71 µ longitudine et latitudine variabili; acie lamellarum e cheilocystidiis heteromorpha vel perpaucis basidiis intermixtis; hypotrichio ex hyphis ramosis inamyloi-deis multiseptato-fibulatis consistente; pilis pilei in parte marginali melleis, 4.2-7 µ crassis, interdum hyalinis, haud septatis, longissimis, apice rotundatis, crassotunicatis (pariete in pilis 4.2 µ crassis — 1.4 µ diam., in pilis 5.5 µ crassis — 1.7-2 µ diam., in pilis 7 µ crassis — 2-2.8 µ diam.), manifeste fortiterque pseudoamyloideis; hyphis omnibus hyalinis fibulatisque haud amyloideis.

Ad «arborem viridem» in silva subtropicali, 24-I-1946, leg. A. Sehnem no. 1917, LIL C 8339.

This species is remarkable for its spores. It belongs to the stirps *Stupparia*, sect. *Eu-Crinipellis*, subsection *Stipitarinae*.

Further collections at the Estação São Salvador include a rather poor specimen of *Crinipellis*, apparently *Crinipellis perpusilla* (Speg.) Sing. on *Bambusa* spec., and a cyphellaceous species. In addition many species observed before were also observed here.

TAIMBESINHO

The collections made at Taimbesinho, at about 1000 m elevation, must be considered in a different light than those at the localities indicated before. Rick has never collected there, nor has anyone else, at least as far as Fungi are concerned. The northern Serra is quite different from the subtropical-tropical localities in the rest of Southern Brazil, as the following, unfortunately very short, list of species will show. All collections were made the 5th of November 1951.

Collybia dryophila (Bull. ex Fr.) Kummer var. **oedipus** Quél.

Pileus «Titian gold» to «Alamo» with paler margin, hygrophanous, cinnamon palid when dry, glabrous, shining when wet but not viscid, glabrous, with short transparently striate margin when wet, smooth to slightly uneven-subsmooth when dry, convex, soon applanate with low obtuse umbo, more rarely obtuse, 13 mm broad, or broader. Lamellae never pure white, varying from pallid with a «cinnamon» shade to sordid ochraceous, with serrulate or denticulate edge, close, rather narrow (1.5 mm for 13 mm pileus diameter), irregularly adnexed to adnate; spore print not obtained, probably white. Stipe cinnamon

to pale ochraceous cinnamon and often more brownish below (mostly near pl. 12, F-8) with sordid-pallid (not white!) thinly strigose mycelial tomentum which is attached to the thallus of the moss, thickened at the base and sometimes strongly swollen there (not so in the Brazilian specimens) and often compressed longitudinally and therefore not terete at the base, vaguely subpruinose above the basal tomentum, or glabrous, hollow and tubulose, 25 mm long or longer, 1 mm thick at thick at the apex, or broader, 2.5 mm broad at the base or much broader. Contex whitish, unchanging, moderately fragile, rather subcartilaginous in the stipe; odor as in the type form, but rather weak.

Spores ellipsoid-subfusiform, smooth, hyaline, nonamyloid 5.5-6.8 × 2-3 μ; basidia about 24 × 5.5 μ, tetrasporous; cystidia none; cheilocystidia well developed, versiform, most of them basidiomorphous to vesiculose, pedicellate, others ventricose in the middle and somewhat ampullaceous, «empty», somewhat larger than the basidia, some with short nodose excrescencies or branchlets, but the majority entire and smooth, thin-walled, occasionally hyphous (cylindrical) and entire, making the edge of the lamellae almost heteromorphous, occasionally with amorphous incrustations especially those that are not entire and smooth, 25-26 × 3-12 μ; epicutis of the pileus pale brownish, consisting of appressed filamentous hyphae which are smooth, or rarely some with some isolated small indistinct nodules; hypodermium deeper chestnut to succineous-brown but without pigment incrustation, also forming a cutis; all hyphae nonamyloid, with clamp connections; hymenophoral trama regular of hyphae 4 μ broad.

In an open Sphagnetum outside the forest, and far from any trees, attached to Sphagnum on a very wet spot, solitary, B 105, LIL, or fasciculate.

Similar material has been studied by Singer in Europe, where it grows in summer and fall in the Sphagneta of Central and Northern Europe, often fasciculately and with much broader base, yet certainly identical with the Brazilian material. A good collection has been gathered by Vasilieva near Kazan, n° 5-342, LE, det. Singer. The form with the less thickened base, usually somewhat smaller, such as described here from Brazil, is also known as *Collybia aquosa* (Bull. ex Fr.) Gillet or *Collybia dryophila* var. *aquosa* (Fr.) Quél. or sp. *aquosa* (Bull. ex Fr.) Konrad & Maublanc. The description given by Fries in Systema Mycologicum (1821) fits our form rather well, but is it based

on prefriesian pictures, and Fries' own conception was modified later so as to include forms as decribed by Ricken under the name of *Collybia aquosa*. Since Quélet is the first to consider both var. *aquosa* and var. *oedipus* as varieties of *C. dryophila,* we prefer the varietal name less apt to cause controversy.

The occurrence of this boreal Sphagnum form in Brazil is interesting from a plant geographical point of view. Nevertheless, this being an adaptation to special conditions derived from the ordinary *Collybia dryophila* which has an enormous area, including Brazil, Argentina and Florida, USA, it is not necessarily a relict form.

Pleurothus araucariicola Sing. spec. nov.

Pileo biso-griseolo-fuscidulo, glabro, nitente in stato sicco, frequenter cuticula diffracta, versiformi, parte marginali subverticali, convexo vel applanato, interdum subdepresso, etc., crasso, lateratiter stipitato vel rarius circiter marginato, usque ad 45 mm lato. Lamellis albidogriseis, lamellulis ad basin lamellarum (i. e. prope carnem pilei) anastomosantibus cum lamellis integris, saepe crispis, crassiusculis, attenuatis vel decurrentibus; sporis in cumulo haud observatis. Stipite laterali vel sublaterali, albo, glabro, levi vel rugoso, obliquo vel subhorizontali, usque ad 19 × 11 mm. Carne alba, immutabili, crasa in pileo, odore fortiter anisato.

Sporis hyalinis, oblongis, lateraliter visis cylindraceis, levibus, guttulis amorphis olei impletis, inamyloideis, 10.2-11.7 × (3.5)-6-6.3 μ; basidiis clavatis tetrasporis, 23-30 × 5.5-7 μ; cystidiis nullis; cheilocystidiis basidiomorphis vel subcylindricis, apice rotundatis, hyalinis, «vacuis», numerosis, 22-32 × 5.5-7 μ; tramate hymenophorali hyalino, irregulari ex hyphis intertextis haud axialoter dispositis, subcrasse tunicatis in adultis, filamentosis, levibus consistente; subhymenio ben evoluto, lato, hyalino; epicute pilei et hypodermio paulum distinctis, ex hyphis filamentosis fuscidulis, densis, repentibus, intertextis, pigmento incrustante carentibus efformatis hyphis omnibus inamyloideis, fibulatis.

Ad truncos emortuos at haud putridos Araucariae brasilianae *in silva montana et in apricis frequenter saepeque caespitose crescens, B 89, LIL.*

This differs from *P. ostreatus* which is closest, by the color of the lamellae and several smaller characters.

Pleurotus ostreatus (Jacq. ex Fr.) Kummer

On dead wood in montane woods, especially on Araucaria, B 90, LIL.

Panus crinitus (L. ex Fr.) Sing.

On dead wood in montane woods, especially on Araucaria, also on Ilex, B 92, LIL.

Marasmius ilicis Sing. spec. nov.

Pileo ferrugineo («spice») margine subaureo (paulum pallidiore quam «saffron y.»), in zona angusta centralissima frequenter ochraceobrunneo («Titian»), in statu sicco omnino cinnamomeo, sulcato disco excepto, glabro, nec pruinoso nec setoso, campanulato, centro applanato vel truncato, 1-2 mm lato. Lamellis albis, acie alba integra praeditis, subdistantibus vel distantibus (± 10 lamellae et interdum paucae lamellulae praesentes in carpophoris maturis), haud intervenosis, haud collariatis, moderate latis, subliberis. Stipite umbrino, in immaturis semper et in maturis frequenter apice albo gaudente, filiformi-setoso, glabro, nudo, levi, nitente, insititio, 5-40 × 0.1 mm. Carne exigua, alba immutabili, inodora.

Sporis hyalinis, levibus, intus granulosis, tenuitunicatis, subfusoideis, inamyloideis, 7-9 × 3.5-3.8 µ; basidiis 22 × 7.5 µ; basidiolis fusoideis; cystidiolis «vacuis», in carpophoris immaturis numerosis, praesertim in acie, fusoideis sed ampullacee vel subcapitate elongatis, nonnihil projicientibus, hyalinis, levibus; cystidiis aliis haud praesentibus; epicute pilei ex strato hymeniformi elementis erectis apiculatis composito consistente; elementis hymeniformiter dispositishyalinis vel castaneis-rufis (pigmento membranae tinctis) interdum melleis, spinulis hyalinis vel plerumque castaneis regularissime obsitis, pedicellatis, vesiculosis, 12-21-(29) × 6.8-10.3-(15) µ, spinulis (0.7-1.2-1.4-(2) µ; hyphis pilei hyalinis, haud gelatinascentibus, inamyloideis, tenuitunicatis, filamentosis.

Ad folia dejecta Ilicis microdontae *(det. B. Rambo), gregatim in silva montana, B 88, B 88 a, LIL.*

This species differs from *Marasmius corbariensis* (Roumeguère) Sing. which is closely related, in being even smaller, having glabrous stipe, white lamellae, and different host.

Pluteus rimosellus Sing. in Singer & Digilio, *Lilloa* **25**: 262. 1951.

Sterile (young) carpophores of this species, on Araucaria trunk, B 96, LIL.

Polyporus tricholoma Mont.

Typical *P. tricholoma* on a new host: *Drymis* spec., in montane woods, on branches, B 93, LIL.

Psathyrella spec.

An undetermined species of *Psathyrella* was found among mosses in montane woods, B 95, LIL.

Psilocybe (?) spec.

An undetermined species of *Psilocybe* was found among *Sphagnum* in open bogs, B 104, LIL.

Psilocybe uda (Pers. ex Fr.) Gillet

Pileus rusty on the umbo («Arab») light yellow (pl. 9, G-3), not viscid, glabrous, smooth, not or slightly striate, convex and obtusely umbonate, 20-25 mm broad.; veil more sordid-pallid than the marginal zone of the cuticle, extremely fugacious and disappearing very early. Lamellae yellow, then umber, very broad and ventricose (4-6 mm broad), adnexed, subdistant to distant, ecentually dusted by the spores (becoming «caucasia»); spore print not obtained. Stipe rusty ocher brown («Arab»), sometimes with some «burnt umber», especially at the base, with coarse fibers which are pale tan colored and especially apparent at the apex, where they may be transversely connecting with each other and furfuraceous, but later entirely glabrescent in most stems, exannulate and without lower belts, generally without any trace of a veil, subequal to subfiliform, deep-rooting in the Sphagna, 60-70 × 2.5 mm (above : 1.5-2 mm diam.). Context yellowish, almost unchanging, taste mild or submild; odor almost as astringent as in the typical Naematolomas *(N. fasciculare* etc.) but weaker.

Spores of dried specimens fuscous to olive, olive brown, deeply colored, smooth, with thick compound wall, with granular contents, or

with a round oil droplet, or with several small round oil droplets and granular contents, rather narrow and boat shaped, with distinct germ pore but not distinctly truncate at the apex, 13.8-20.5 × 6.8-9.7 μ; basidia 1-2-3-4-spored, the tetrasporous ones quite normal and ventricose to clavate, the ones with one sterigma always having the latter strongly elongated (13.5-15 μ), those with two often having it elongated (8-14 μ), main body not appreciably different in size in the various types, hyaline, 26-32 × 9.5-9.7 μ; cheilocystidia hyaline, characteristically ventricose below, and ampullaceous, the « neck » nearly always capitately enlarged, generally as shown in Konrad & Maublanc under this name, 26-37 × 11-13.8 μ; pleurocystidia none, neither in form of chrysocystidia nor in any other form; there is always an olive yellow pigment in the NH_4OH preparations of the hymenophore, but this dissolves easily and disappears upon stronger pressure on the cover glass; epicutis of the pileus consisting of filamentous repent hyphae; hymenophoral trama regular, some hyphae somewhat thickened; all hyphae with clamp connections.

Chemical characters: $FeSO_4$: deep green olive in all parts.

Among *Sphagna* in a Sphagnetum, far from any trees, attached to the thallus of the *Sphagna,* in small groups, spring, B 103, LIL.

The determination of this species is at variance with that of A. H. Smith, *The North American Naematolomas, Mycologia* **43**: 483. 1951. Smith described there a species with equally large spores but with chrysocystidia under the name of *Naematoloma udum* (Pers. ex Fr.) Karst. while I put somewhat earlier in the same year *(Lilloa* **22**: 567. 1951) *Psilocybe uda* (Pers. ex Fr.) Gill. in *Psilocybe* saying « it is possible that (it) enters this genus but the author has not recently studied the cystidia ». Now, neither Konrad & Maublanc (with whose picture and description our collection from Brazil is in perfect agreement) nor Ricken have observed pleurocystidia, and this was also pointed out by Kühner who studied the cystidiate species of the *Strophariodeae (Naematoloma* called *Hypholoma* by him). As a result, we have the situation that there are two large-spored species, evidently none of them merely a two-spored form of *Naematoloma elongatipes* (Peck) Sing. *(N. elongatum* (Pers. ex Fr.) Konrad a later synonym of *Naematoloma elongatipes),* as was surmised by R. Maire. Whether A. H. Smith's *Naematoloma udum* or my *Psilocybe uda* are the real *Agaricus udus* of Persoon and Fries is difficult to tell if only the descriptions of these classical authors are compared. However, there should be a way to solve this question by revising all the

European material, particulary that from Sweden, an important job that could be done at Uppsala and in the Riksmuseet at Stockholm, with special emphasis on the presence and absence of chrysocystidia, and if only specimens without chrysocystidia are found, the epithet *uda* should be used exclusively for the *Psilocybe* described above. If only specimens with chrysocystidia are found, my species should be renamed. If both cystidiate and acystidiate forms are found, *Agaricus udus* should be considered as a nomen dubium and be discarded. In that case *Psilocybe squalidella* var. *macrosperna* Peck might be elevated to specific rank and the Brazilian species should be given a nomen novum.

I am convinced that a species corresponding in its characters to what is described above as *Psilocybe uda* exists in the northern hemisphere, and it would be very interesting to corroborate this since the Brazilian area of this species is necessarily quite isolated from any northern area of an indentical species. This would make our data more precise as far as the geographic disjunction is concerned. But even as it is, there exists geographic disjunction as far as the section Tenaces (Fr.) Sacc. em. Sing. of Psilocybe sensu str. is concerned, so that it even now serves as an example of continental disjunction of the area of a taxon.

Comparing our macroscopical description with that of Ricken, we notice only that our plant is not rugose in wet condition, merely short-furrowed in dry condition as also shown by Konrad & Maublanc. The veil is so fugacious is was never noticed by other authors, but since this species has obviously hemiangiocarpous development, the presence of a very fugacious marginal veil is not at all surprising and should be discovered in the European or North American counterpart just the same as it has been discovered in very well preserved young specimens of *Psilocybe semilanceata* (Fr.) Kummer by observation made in Europe by Singer.

Rick indicates *Psilocybe uda* from Rio Grande do Sul. Although the present collection of material determined so seems to corroborate his indication, it is almost certain that his determination was wrong. He never collected at the higher altitudes in the Sphagneta of the Serra, and the species is not expected to occur in quite different subtropical surroundings as offered in the subtropical vegetation of the classical collecting places visited by Rick.

Melanotus spec.

An undetermined species of this genus was observed on *Araucaria brasiliana*, B 94, LIL.

Galerina subtibiicystis Sing. spec. nov.

Pileo ochraceobrunneolo, hygrophano, glabro, nudo, convexo obtuso, demum margine recurvato, 10-15 mm lato. Lamellis ferrugineo-ochraceis, subhorizontalibus in maturis, adnatis, et dente subdecurrentibus, demum decurrentibus, latiusculis vel latis, mediocriter confertis, simplicibus; sporis in cumulo haud observatis. Stipite pallido, demum luteo, ad apicem subruguloso vel sublevi, sericeo-subpruinoso ad apicem, glabro in parte majore inferiore, velo fugaci pallido sparso ornato, subaequali, 60-65 × 1.5-3 mm. Carne subconcolori hygrophanaque, fragili, inodora.

Sporis 8.8-10.3-(11) × 5-5.5-(7.2) μ, subtiliter punctulatis, disco levi suprahilari destitutis, interdum (e basidiis bisporis natis) sensim elongatis (11.7 × 4.8 μ), bene coloratis, haud facile collabentibus, plerumque subellipsoideis; basidiis plerumque tetrasporis, sed bisporis haud raris, perpaucis interdum trisporis, 25-29 × 7.5-8.3 μ; cystidiis nullis; cheilocystidiis manifeste filamentosis apice capitatis, prope basin incrassatis (5.5-7 μ latis), 30-45 × 1.2-3.8 μ, capitulo 3.5-5.5 μ diam.; dermatocystidiis stipitis de apice ad ipsam tertiam inferiorem descendentibus, 33-70 × 6.5-7 μ; epicute pilei ex hyphis filamentosis levibus repentibus consistente; hyphis connectentibus tenuibus defibulatis (fibulis in epicute pilei et in strato superiore stipitis nullis) sed in hyphis fundamentalibus saepe voluminosis et interdum subglobose abreviatis saepe praesentibus; tramate hymenophorali regulari, haud vel perpaulum incrustatis hyphis parallelis consistente, multis hyphis fundamentalibus fibulatis voluminosis.

Ad Sphagna viva in Sphagneto aprico montano, vernalis, Rio Grande do Sul, Brasiliae, B 102, LIL.

This species is remarkable for the differentiation of the hyphae in correlation with the ocurrence of clamp connections. It differs from *G. tibiicystis* (Atk.) Kühner in the clamp-less hyphae of the epicutis of the pileus and the surface of the stipe as well as of all other connective hyphae, the broader spores, decurrent lamellae, shorter stipe, and the presence of numerous basidia with less than 4 sterigmata. It differs from *G. clavata* (Veln.) Kühner in larger spores and the presence of clamp connections in the fundamental hyphae, also in the sphagnophilous habitat. It differs from *G. graminea* (Veln.)

Kühner in its never collapsing spores which are also broader, and in its habitat.

This is the first of three species of *Galerina* found in the Sphagnum of the montane region of Rio Grande do Sul which are transitions between the hitherto extremely sharply separated sections of *Galerina* proposed by Kühner. This is interesting because of the isolation of these species from other sphagnophilous species, and they may be considered as less recent than the species known up until now, some of them theoretically difficult to distinguish from *Cortinarius* except by the supposed mycorrhizal connections of the latter genus and different physiological characters when grown in pure cultures. Nevertheless they are so closely related to the known Galerinas, that there can be no problem in their generic position. The only species which is fitting completely into the current sectional descriptions, is *Galerina sphagnorum*, and this cannot be taken to be a coincidence since it is likewise the only species which is not endemic as far as our present knowledge is concerned.

Galerina semiglobata Sing. spec. nov.

Pileo coloribus G. sphagnorum *gaudente: hygrophano, in humidis longe transparenter striato, glabro, convexo-semiglobato in juvenilibus et vetustis sed demum margine interdum reflexo-recurvaio, vel ut minimum minus declivi quam in parte centrali, cc. 10 mm lato. Lamellis brunneoluteis (inter « nugget » et « Antique gold », ceterum ut in* G. sphagnorum *sporis in cumulo haud observatis. Stipite pallido, demum luteolo et magis ochraceobrunneo in parte superiore quam in* G. sphagnorum, *haud pruinoso, velo fugaci albo praedito sed semper evelato in maturis, 35 × 1.5 mm. Carne superficiei subconcolori, hygrophana, fragili, inodora.*

Sporis 9-11.7 × 5.5-7.3 μ, raro usque ad 12 × 5 μ in sporis ebasidiis bisporis ortis, plerumque fusoideo-ellipsoideis, endo-, epi-, exosporio compositis et haud collabentibus, subtilissime punctulatis, interdum punctatione exosporali ex toto carentibus, disco levi suprahilari destitutis et limitatione nulla obvia; basidiis plerumque tetrasporis, paucis bisporis vel trisporis, 22.5-32 × 8-9 μ; cystidiis nullis; cheilocystidiis 28-44 × 5.5-9.7 μ, plerumque 8-8.5 μ latis ad basin, apice tenuiore, haud capitato vel subcapitato (rarius usque ad 7 μ lato), parte superiore saepissime cylindracea et 2.7-3.7 μ lata praeditis, eis G. tibiicystidis *haud similibus, hyalinis rarius ochraceobrunneolis; tramate hymenophorali regulari, melleo vel hyalino, ex hyphis paulum incrustatis consis-*

tente; epicute pilei ex hyphis eis hypodermii tenuioribus hyalinis vel subhyalinis repentibus, levibus consistente; hypodermio ex hyphis ochraceo-brunneo-incrustatis pigmenti epicellularis causa, crassis, cutem formantibus consistente; ihyphis omnibus (connectivis inclusis, etiam in epicute pilei) fibulatis.

In Sphagnetis, densius gregatim, ad thallus Sphagnorum, vernalis, Rio Grande do Sul, Brasiliae, B 100, LIL.

This species is closest to the following; it agrees with section *Tubariopsis* in the lack of a plage on the spores, but differs in the presence of clamp connections in all hyphae. It differs from *G. hypnorum* in having no plage on the spores (which are not provided with a persistent perisporium either), in glabrous (non-pruinose) stipe which is decidedly more brownish than usual in *G. hypnorum*, and in the sphagnophilous habitat. It differs from *G. taimbesinhoensis* in being larger, having more distinct veil, more ocher brown stipe, semiglobose pileus which is obtuse, and in the presence of completely non-ornamented spores.

Galerina taimbesinhoensis Sing. spec. nov.

Pileo magis flavo quam ochraceobrunneo in majoritate specimiņum sed interdum ex toto ochraceobrunneo, in multis carpophoris partim ochraceobrunneo ut in G. sphagnorum, *glabro, nudo, campanulato vel campanulato-papillato, demum late campanulato subumbonatoque, per medium radium pellucide strato in humidis, sed in nonnullis carpophoris minus, in aliis magis striato, 3.5-5 × 3.5-5.5 mm. Lamellis ferrugineo-ochraceis subdistantibus, mediocriter latis vel latis, subascendentibus ventricosisque, adnexis. Stipite flavido-pallido, demum interdum subbrunnescente, ad apicem pruinosulo, velo fibrillosulo, admodum sparso fugacissimo ornato, mox glaberrimo vel innate sericello, apice versus attenuato, 20-35 × 1 mm. Carne subconcolori, hygrophana, fragili.*

Sporis 8.2-11 × 5.2-6.2 μ, mediocriter bene coloratis, subtilissime punctatis, sublevibus in circumferentia, disco suprahilari levi destitutis, endo-, epi-, exosporio praesentibus sed membrana mediocriter crassa praeditis, applanatione vel depressione levissimis suprahilaribus praeditis, subfusoideo-ellipsoideis sed in sporis e basidiis bisporis ortis subcylindraceo-ellipsoideis (magis elongatis) et tunc 11.7 × 4.5 μ, sed plerumque ut descriptae sunt supra, saepe mucrone minimo calloque ad apicem ornatis; basidiis bi-tri-tetrasporis, plerumque tetrasporis, hyalinis vel melleis, plerumque clavatis, ad basin fibulatis, 20.5-25 × 6.8-9.7 μ;

cystidiis perpaucis prope ipsam aciem tantum visis, rarissimis et cheilocystidioideis; cheilocystidiis ad basin ventricosis, longe effilatis et cylindraceis in parte majore superiore et 2.3 μ crassis, raro in capitulum amorphum deformatum incrassatis et tunc usque ad 10.3 μ latis (ad apicem), sed plerumque aequalibus in parte superiore quae longitudine sua partem basalem ventricosam superat, hyalinis, haud incrustatis, numerosis, 31-51 × (7)-9.5-13.8 μ, basidiis paucis interdum interspersis; cheilocystidiis typi alteri paucis, ventricosis vel late fusoideis vel fusoideo-vesiculosis apice filiformi carentibus cheilocystidia marginantibus, frequenter brunneolis, possibiliter cheilocystidia immatura vel retardata repraesentantibus; tramate hymenophorali prope hymenium ex hyphis angustis, in centro ex hyphis latis incrustatisque melleis consistente; ceterum characteribus Galerinae hypnorum *gaudente.*

Ad Sphagna in Sphagneto aprico, sparse, vernalis, B 101, LIL.

This differs from *G. clavata* in broader spores, presence of clamp connections in the covering layers and connective hyphae as well as in the fundamental hyphae, in guttulate (inside) spores and a strongly developed endosporium, furthermore in the sphagnophilous habitat.

Galerina sphagnorum (Pers. ex Fr.) Kühner

Pileus in the center mostly « desert », i. e. paler than on the margin or assuming a tone like « sorrel », i. e. more intensely colored than on the margin where it is « raw sienna » to « mast color ». hygrophanous, paler (pl. 9, F-4 to pl. 10, F-5) when dry, glabrous, smooth, but transparently striate almost to the papilla when wet, naked, campanulate and umbonate, or convex and paillate, also convex and umbonate, or very rarely convex and umbilicate, 9-10 mm broad. Lamellae « saratoga » to « yucatan », ascendant, then subhorizontal, or quite horizontal, usually ventricose and broad, subclose to medium close, sometimes subdistant, up to 4 mm broad, simple or sometimes somewhat forked, varying from rounded-adnexed to planely adnexed or adnate, but never decurrent, not even with decurrent tooth; spore print not observed, apparently rusty. Stipe pallid, eventually yellow (« jonquil » or pl. 10, I-5) but the base remaining pallid where it is attached to the Sphagnum, above often uneven but otherwise smooth, glabrous except for the apex which is silky-subpruinose, but glabrescent, and a pallid veil which connects the apex of the stipe with the margin of the pileus, but not leaving any traces in mature material, not « chatoyé » or belted below, often curved, 55-72 × 1.5-3 mm;

veil in young specimens usually not forming anything like an annulus, rarely forming an extremely fugacious indistinct ring. Context subconcolorous, hygrophanous, becoming white in the apex of the stipe when dry (not dried); odor very weak, not farinaceous, or absent, if present rather raphanaceous; taste farinaceous, mild.

Spores finely and lowly marbled-verruculose, appearing smooth when the peripheric part is focussed upon in ammonia, with suprahilar plage which is indistinctly but definitely limited, melleous-ferruginous, bright and deeply ferruginous in KOH, almond-shaped, 9.5-10.3 × (4)-6.2-7 μ; basidia tetrasporous, hyaline, clavate, 26-33 × 10.3 μ; cystidia cheilocystidoid, only extremely close to the edge and very rare, practically absent; cheilocystidia hyaline to ocher, versiform, most frequently strongly broadened and subcapitate at the apex, without, more rarely with another thickening below, but also frequently clavate, rarely ventricose in the middle, 30-65 × 4.8-9.5 μ, most frequently 37-62 × 9-9.5 μ and often reaching 10.3 μ at the apex (if subcapitate); hymenophoral trama regular, its hyphae with clamp connections; base of cheilocystia with clamps.

Chemical characters: Everywhere slowly greenish black with $FeSO_4$.

On Sphagnum in Sphagneta, far away from any trees, spring, B 99, LIL.

This is the most common of the Sphagnum-Galerinas of Taimbesinho. It is at the same time the most typical Galerina of the type section, and without any doubt identical with the European and North American species. In Europe and North America, *G. sphagnorum* also reaches fairly far to the south and is one of the commonest of the sphagnophilous species. Larger than the Brazilian species in certain collections, it shows everywhere the same microscopical and chemical characters. A collection identical with the Brazilian one was gathered by Erdman West, « widely scattered in Sphagnum a few miles northwest of Gainesville, December 2, 1938 » and determined correctly *Galerina sphagnorum* (or rather *Galera sphagnorum*) by Murrill (FLAS), in Florida, USA. This species has, however, not been observed in the « turberas » of Tierra del Fuego (Fireland) where *Galerina paludicola* (Atk.) Sing. predominates.

Aside from the species indicated above, *Coriolus pinsitus* (Fr.) Pat. (on *Baccharis* spec.) and *Coriolus* spec. (on *Ilex microdonta*) was collected; furthermore *Schizophyllum commune* Fr. on *Araucaria brasiliana,* one Discomycete each on Dicksonia and on Ilex, *Pycnoporus*

cinnabarinus (Jacq. ex Fr.) Karst. on various hosts includin Araucaria, and various *Fungi Imperfecti,* Ascomycetes (on *Gomidesia sellowiana, Ilex microdonta,* etc.

III. THE AGARICALES FLORA OF RIO GRANDE DO SUL

The following list is a resumé of the preceding studies and is intended to show the present status of our actual knowledge of this group of Basidiomycetes and to serve as a basis for general conclusions. All dubious and unverified indications have been eliminated, and all species probably occurring because of their existence in neighboring territories (Misiones, Argentina, State of Santa Catarina; Uruguay) have been omitted unless indicated by Rick.

Hygrophoraceae:

Probably occurring, at least the genus *Hygrocybe,* but no data referable with absolute confidence.

Tricholomataceae:

Calocybe rubra Rick ex Sing.; Calocybe cyanea Sing.
Laccaria tetraspora Sing.
Clitocybe aberrantissima Sing.; Clitocybe basirosea (Rick) Sing.
Lepista glabella (Speg.) Sing.; Lepista sordida (Fr.) Sing; Lepista nuda (Bull. ex Fr.) W. G. Smith.
Tricholomopsis araucariae Sing.
Collybia dryophila (Bull. ex Fr.) Kummer and var. *oedipus* Quél; Collybia butyracea (Bull. ex Fr.) Kummer; Collybia subfumosa Speg.
Trogia cantharelloides (Mont.) Pat.
Armillariella puiggarii (Speg.) Sing. and forma olivacea (Rick) Sing.
Callistosporium luteofuscum Sing.
Cantharellula coprophila (Speg.) Sing.
Leucopaxillus rickii Sing.; Leucopaxillus brasiliensis (Rick) Sing. & Sm.; Leucopaxillus gracillimus Sing. & Sm.
Lentinellus angustifolius (Romell) Sing.
Melanoleuca spegazzinii (Sacc. & Syd.) Sing.
Resupinatus subrhacodium Sing.
Hohenbuehelia angustata (Berk.) Sing.
Dictyopanus pusillus (Lév.) Sing.

Schizophyllum commune Fr.

Pleurotus magnificus Rick; Pleurotus ostreatus (Jacq. ex Fr.) Kummer; Pleurotus spec. (Pleurotus cornucopioides sensu Rick); Pleurotus araucariicola Sing; Pleurotus hirtus (Fr.) Sing.

Panus crinitus (L. ex Fr.) Sing. with transitions to Panus schnyderi (Speg.) Sing.; Panus siparius (Berk. & Curt.) Sing.; Panus rudis Fr., var. rudis, var. semirudis (Sing.) Sing., var. strigellus (Berk.) Sing.

Lentinus puiggarii Speg.

Oudemansiella steffenii (Rick) Sing.; Oudemansiella canarii (Jungh) Höhnel.

Xerula pilosa (Rick) Sing.; Xerula chrysopepla (Berk. & Curt.) Sing.

Marasmiellus fascicularis Rick ex Sing; Marasmiellus nauseosus (Rick) Sing.; Marasmiellus icterinus Sing.; Marasmiellus pygmaeus (Rick) Sing.; Marasmiellus spec. (Clitocybe nivea Rick); Marasmiellus subpumilus (Rick) Sing.; Marasmiellus viridiluteus (Rick) Sing.; Marasmiellus irregularis (Rick) Sing.; Marasmiellus cupreovirens (Speg.) Sing.; Marasmiellus tropicalis (Speg.) Sing.; Marasmiellus byssisedus (Bres.) Sing.; Marasmiellus incrustatus Sing.

Marasmius echinatus Theissen ex Sing.; Marasmius ilicis Sing.; Marasmius silvicola Sing; Marasmius haematocephalus Mont.

Crinipellis stupparia (Berk. & Curt.) Pat.; Crinipellis macrosphaerigera Sing.

Crinipellis perpusilla (Speg.) Sing. (?).

Mycena sanguinolenta (A. & S. ex Fr.) Kummer; Mycena mucor (Batsch ex Fr.) Gillet; Mycena subtenerrima Rick; Mycena humilis Rick; Mycena aff. euspeirea (Berk.) Sacc. (Omphalia condiscipula sensu Rick); Mycena spec. (Mycena alcalina var. brasiliensis Rk).

Heimiomyces tenuipes (Schwein.) Sing.; Heimiomyces pruinatipes Sing.

Hydropus riograndensis Sing.

Filoboletus gracilis (Klotzsch ex Berk.) Sing.; Filoboletus staudtii (Henn.) Sing. comb. nov. (Favolaschia staudtii Henn).

Amanitaceae :

Amanita spec.

Limacella spec. (?).

Volvariella bombycina (Pers. ex Fr.) Sing.; Volvariella pusilla (Pers. ex Fr.) Sing.

Pluteus fibulatus Sing.; Pluteus phlebophorus (Ditm. ex Fr.) Gillet; Pluteus umbrinoalbidus Sing.; Pluteus rimosellus Sing.; Pluteus riograndensis Sing.; Pluteus viscidulus Sing. in Singer & Digilio.

Agaricaceae :

Lepiotella brunnea Rick.

Chlorophyllum molybdites (Meyer ex Fr.) Mass.

Macrolepiota bonaerensis (Speg.) Sing.

Leucoagaricus confusus (Rick) Sing.; Leucoagaricus rubrosquamosus (Rick) Sing.; Leucoagaricus olivaceomamillatus (Rick) ex Sing.

Leucocoprinus cepaestipes (Sow. ex Fr.) Pat.

Melanophyllum echinatum (Roth ex Fr.) Sing.

Lepiota crassior Sing.; Lepiota flavidula (Rick) Sing.; Lepiota spec. (Mycena viridiflava Rick); Lepiota spec. (Inocybe sublanuginosa Rick).

Cystolepiota spec. (Mycena violaccogrisea Rick).

Agaricus campestris L. ex Fr. or pampeanus (Speg.) Speg.; Agaricus spec. (see chapter I under Pholiotella).

Smithiomyces mexicanus (Murr.) Sing.

Ripartitella brasiliensis (Speg.) Sing.

Coprinaceae :

Coprinus comatus (Müller in Fl. Dan. ex Fr.) S. F. Gray.

Pseudocoprinus disseminatus (Pers. ex Fr.) Kühner.

Psathyrella candolleana (Fr.) A. H. Smith.

Panaeolus phalaenarum (Fr.) Quél.

Anellaria sepulchralis (Berk.) Sing.

Bolbitiaceae :

Bolbitius reticulatus (Pers. ex Fr.) Ricken.

Agrocybe fimicola (Speg.) Sing.; Agrocybe perfecta (Rick) Sing.; Agrocybe neocoprophila Sing.; Agrocybe puiggarii (Speg.) Sing.; Agrocybe aegerita (Brig.) Sing.

Strophariaceae :

Stropharia coronilla (Bull. ex Fr.) Quél.

Naematoloma subumbonatescens (Murr.) Sing.; Naematoloma spec. (Hebeloma miserum Rick, authentic).
Psilocybe uda (Pers. ex Fr.) Gillet; Psilocibe cubensis (Earle) Sing.
Deconica spec. (Naucoria albofimbriata Rick); Deconica spec. (see chapter III, n° B 21, Parecí).
Melanotus spec. (see chapter III, n° B 94, Taimbesinho).
Pholiota apiahyna (Speg.); Pholiota cf. polychroa (Berk.) Smith & Brodie (Pholiota olivaceocoriacea Rick, authentic).

Cortinariaceae :

Inocybe hyperythra Rick; Inocybe violaceolamellata Rick.
Gymnopilus peliolepis (Speg.) Sing.; Gymnopilus chrysopellus (Berk. & Curt.) Murr.
Galerina minor Sing.; Galerina arenaria Sing.; Galerina subbullulifera Sing.; Galerina sphagnorum (Pers. ex Fr.) Kühner; Galerina semiglobata Sing.; Galerina taimbesinhoensis Sing.; Galerina subtibiicystis Sing.

Crepidotaceae :

Crepidotus quitensis Pat.; Crepidotus palmarum Sing.; Crepidotus uber (Berk. & Curt.) Sacc.; Crepidotus croceotinctus Peck.

Rhodophyllaceae :

Clitopilus septicoides (Henn.) Sing.; Clitopilus rhodotrama Sing.; Clitopilus scyphoides var. submicropus (Rick) Sing.
Rhodocybe gilvoides (Rick) Sing.
Rhodophyllus squamifolius (Murr.) Sing.; Rhodophyllus anastomosans (Rick) Sing.; Rhodophyllus spec. (Pluteus leptonioides Rick).

Paxillaceae :

Paxillus panuoides (Fr. ex Fr.) Fr. (introduced species, according to Rick).
Neopaxillus echinospermus (Speg.) Sing.

Boletaceae :

Phaeogyroporus tropicus (Rick in Rehm & Rick) Sing.
Gyrodon rompelii (Pat. & Rick) Sing.
Xerocomus brasiliensis (Rick) Sing.

Russulaceae :

Russula puiggarii (Speg.) Sing.; Russula theissenii Rick; Russula riograndensis Sing.
Lactarius braunii Rick; Lactarius russula Rick.

The Family *Polyporaceae* in the narrower sense (genus *Polyporus* sensu str. etc.) has been left out here because it is traditionally treated with the Aphyllophorales.

Certain genera have also been omitted although their occurrence is highly probable, such as Gerronema (*Omphalia elastica* Rick!); *Anthracophyllum lateritium* (Berk. & Curt.) Sing. is probably what has been described as *Xerotus berterii* Mont. by Rick; *Paxillus minialus* Rick, type of the genus Phyllobolites is too striking a species to be merely another species of some defined genus, or a synonym, and may be re-collected in the future; *Chaetocalathus liliputianus* (Mont.) Sing. has been collected by Singer & Digilio in Misiones (Argentina), not far from the eastern part of the State of Rio Grande do Sul, and certainly occurs there, and various Conocybes — although not one determined species is known at present — are certain to occur in the State inasmuch as they occur both in Misiones and in the State of São Paulo. However, the list given above is bound to be incomplete, and it is too early to draw any conclusions from the fact that a given genus or species is absent from the list. However, even an incomplete list serves for comparison with other comparable regions if it is taken as a basis to determine the percentage of species in common with those regions provided that the latter are floristically well known. Such floral districts with well known mycoflora are the Selva Tucumano-Boliviana in its southern extension (on Argentine territory, Orán excluded) and the State of Florida, USA. The former represents the southwestern fringe of the American tropical-subtropical forest regions while Florida represents the northeastern one.

Analyzing the list of species given here for Rio Grande do Sul, one arrives at the following proportions:

Species ocurring in Rio Grande do Sul, and also in the Selva Tucumano-Boliviana	43 %
Species occurring in Rio Grande do Sul, and not occurring in the Selva Tucumano-Boliviana	57 %
	100 %

This proportion appears to be very high. In reality, since it includes those species that occur not only in the two subtropical regions mentioned but likewise species with wide distribution, e. gr. almost cosmopolitan species like *Schizophyllum commune* Fr., *Clitopilus septicoides* (Henn.) Sing., and the majority of the Coprinaceae, *Volvariella bombycina* (Pers. ex Fr.) Sing., and many others, we shall arrive at a more representative figure by excluding those species that have an area including the Eastern Hemisphere. We have then

American species occurring in both Rio Grande do Sul and Selva Tucumano-Boliviana	22.5 %
American species occurring in Rio Grande do Sul but not in the Selva Tucumano-Boliviana	77.5 %
	100 %

This means, in other words that, the pantropical species and those with continental area-disjunction excluded, and furthermore discounting the near-cosmopolitan species, nearly one quarter of the species occurring in Rio Grande do Sul also occurs in the Selva Tucumano-Boliviana. This result is a quantitative corroboration of our statement in the introduction regarding the desirability of a deeper knowledge of the fungi studied by Rick in order to name and compare the species of other South American floras, especially that of the Argentine Republic. It, furthermore, shows that the percentage of species absent in the West, justifies the mycogeographic separation of an eastern and a western subtropical fungus flora in Southern South America, both merging with more completely tropical regions (Orán and Santa Catarina, Coastal forest) but separated from each other by more xerophytic regions.

However, the number of endemics is not as high as 57 %. It is always very difficult to determine the number of endemics in a region surrounded by or neighboring with floristically poorly known regions, such as Central and Northern Brazil, Paraguay, and the Coastal forest of Santa Catarina in our case. It is even more difficult if the mycoflora of the region under consideration is only partly explored. Nevertheless, taking all this into consideration, we arrive at the following, probably rather inaccurate figures:

Rio Grande do Sul endemics	27 %
Occurring in other regions of South America	73 %
	100 %

Among these 73 %, we find included the 22.5 % which also occur in the Selva Tucumano-Boliviana. Furthermore, we find that 35 % of the entire number of species also occur in Florida, USA. Again, this figure appears rather high, and we subtract the species which, aside from occurring in Brazil and in Florida, also occur in the temperate regions of North America and / or in Europe, as well as the pantropical elements (such as *Panus crinitus, Panus siparius, Oudemansiella canarii,* etc.) and we arrive at the fellowing figures:

American subtropical and tropical species occurring both in Rio Grande do Sul and Florida	17 %
Others species	83 %
	100 %

Comparing these figures with those obtained by eliminating the species occurring in Tucumán province north to Salta, and at the same time in the State of Rio Grande do Sul, we find that the number of species having an area so large as to include both Rio Grande do Sul and Florida is much smaller than the number of those with an area including both southern fringes of the tropical-subtropical belt of South America. This result had to be expected, yet it is in contradiction with the erroneous belief shared by many botanists that fungi have no definite areas and depend merely on host and temperature differences

As we have pointed out before, Rick believed strongly in the similarity not merely of the various districts of the American thermophilous fungous flora but believed that the mycoflora of Rio Grande do Sul in particular, and that of the tropics in general consists merely of the same species plus local aberrations of European species such as enumerated in Fries, Hymenomycetes Europaei. Only few very strongly aberrant forms characteristic for the tropics can be termed, according to Rick, anything better than vicariating races. The following percentages based on our list of Rio Grande fungi and compared with the European and temperate North American mycoflora, will show that this view cannot stand up against the facts provided by a critical revision of the fungi of Rio Grande do Sul:

Species occurring in Rio Grande do Sul and in the cool temperate regions of North America and Europe	21 %
Species occurring in Rio Grande do Sul and not occurring in the temperate regions of the northern hemisphere	79 %
	100 %

Species occurring in Rio Grande do Sul and in the Eastern Hemisphere (European and pantropical species, cosmopolitans)	21 %
Species occurring in Rio Grande do Sul but not in the Eastern Hemisphere (American species)	79 %
	100 %

Even the view that all important genera of the Eastern hemisphere are also represented in Brazil and vice versa, cannot be maintained. This view was based on the artificial Saccardo scheme where exotic (from the European point of view) species were pressed into the genera separated exclusively according to a method not even easily applicable in Sweden, useless in North America, and completely misleading in the tropics. There is no doubt but that Rick had no other choice than to adhere to Saccardo's scheme since his library was too limited to make it possible for him to apply the methods of Patouillard and the modern taxonomists of Agaricales, nor did he have the equipment, or even the leaning toward anatomical and microchemical work with an emphasis on natural classification. In his last unpublished work, Rick describes as a new species of Favolus, which is actually a species of Agaricus with a teratological transformation of the hymenophore, one of those rare favoloid monstrosities, and he did this not because he was unaware of the origin of this form, but because of a different view on systematics. Rick was primarily a field mycologist and undoubtedly a good one. Yet, in order to keep the record straight, we add one more statistical fact: Out of 72 genera of Agaricales, known to occur in Brazil, there are 13, i. e. roughly one sixth, non-European genera, i. e. genera without a single European representative. This figure is probably too low, since, as we have already pointed out, such genera as Anthracophyllum, Gerronema, and Phyllobolites will soon be known as occurring with certainty in the State of Rio Grande do Sul, and the proportion of « European » genera, thus far not included in our list, will most certainly be smaller.

Consequently, we may say that the fungi, at least the Agaricales, obey the same empirical rules governing the phytogeography of flowering plants. « European » species observed in Brazil are either near-cosmopolitan species or species with continental area disjunction, or else introduced species (« adventive »), and altogether make up less than a fifth (18 %) of the entire Agaricales flora. There are genera with definitely restricted area, and European generic keys are next to useless in tropical America. If it is necessary to point

out a difference in the phytogeography of fungi and flowering plants, it may be said that the area of distribution of a genus is in an average — not consistently in all cases — smaller in the Angiosperms than in the Agaricales, unless it is limited by the host range (parasites and symbionts); likewise, the average area of a fungous species is larger than that of a phanerogamic species unless, again, it is restricted by selective parasitism or symbiosis. All these facts, hitherto obscured by lack of facts and by the application of the Saccardoan schematism, are neither revolutionary, nor unexpected.

Yet, they are important not only for theoretical reasons, but because of the logical consequence that they provide the basis for a useful cooperation of the mycologist in problems of general plant geography and floral history, in Brazil as well as elsewhere.

Fundación Miguel Lillo, Tucumán.