might be separated. Ricken has discovered two forms with different spore sizes, one which he calls the type has spores 13-15 x 7-8 micr.; the other, which he calls var. *repanda* has spores 11-13 x 6-7 micr. All collections examined by me, including two of Peck's and several from Ithaca, N. Y., yielded the spore-size given in my description. Two of Peck's collections, from Sand Lake and Catskill Mountains referred to in his 23rd Report, when examined had spores measuring 15-19 x 7-8.5 micr., and in other respects showed that they did not belong here, but are probably close to *C. muscigenus* Pk.

310. Cortinarius cylindripes Kauff.

Bull. Torr. Bot. Club, Vol. 32, p. 321, 1905.

Illustrations: Ibid, Fig. 2, p. 306.
Jour. of Mycology, Vol. 13, p. 36, Pl. 98, 1907.
Mycological Bull., Vol. V, Fig. 244, p. 318, 1907.
Plate LXIV of this Report.

PILEUS 3-7 cm. broad, *very glutinous at first* and shining, later opaque, at the very first lavender, then yellowish with a violaceous tinge, at length brownish-ochraceous, somewhat stained by these colors at various stages, obtusely orbicular when young, then campanulate and expanded, rather small in comparison with the length of the stem, margin incurved and pellucid-striate, surface smooth, *at length longitudinally wrinkled.* FLESH thick on disk, thin elsewhere, *violaceous,* soon sordid-white. GILLS rather broad, at length 5-8 mm., adnate, emarginate, not attenuate in front, *violaceous or lavender* when *young,* becoming pale cinnamon, not crowded, thin, edge serratulate-flocculose and paler, somewhat wrinkled at the sides but not veined. STEM 8-10 cm. long, 5-9 mm. thick, elastic, *remarkably equal, covered by a violaceous, glutinous, universal veil,* which remains as evanescent, adnate patches and at its junction with the partial veil as a slight annulus, smooth or fibrillose-striate at the apex, violaceous to dingy white within, solid stuffed. SPORES *almond-shaped,* rough-tuberculate, inequilateral-elliptic, 12-15 x 6.5-8 micr., dark brown. BASIDIA 40-45 x 10-13 micr., 4-spored, with sterigmata, 5-7 micr. long. ODOR and TASTE not specific.

Gregarious or subcaespitose. On low, rich ground or humus, conifer and frondose woods. Throughout the State. From late July to early October. Frequent.

C. cylindripes usually occurs in considerable numbers where found. Its cylindrical stem is at first a beautiful pale azure-blue, due to the thin universal veil, which fades and leaves whitish thin patches which sometimes disappear. The species corresponds to Fries' species, figured in his unpublished plates at Stockholm and named *C. collinitus.* (See notes under *C. mucifluus.*) Specimens of that species collected in Sweden are in my herbarium and have spores measuring 14-18 micr. long, much larger than in the American form. I consider that species, common around Stockholm, as Fries' original *C. collinitus.* Our species, described above, has violaceous or blue tints just like that one, and as Fries has described no other species to which the Stockholm plants could be referred, the indication is strong that he considered them *C. collinitus.* For the present the difference in the spore size will be sufficient to keep *C. cylindripes* distinct. The violaceous gills, etc., distinguish *C. cylindripes* from both Fries' and Ricken's conception of *C. mucosus,* and from the related species of Peck: *C. muscigenus* Pk., *C. splendidus* Pk., and *C. elatior pallidifolius* Pk.

311. Cortinarius muscigenus Pk.

N. Y. State Mus. Rep. 41, 1888.

"PILEUS 3-6 cm. broad, at first ovate, then convex, or concave from the recurving of the margin, subumbonate, glabrous, *viscose with a separable pellicle, tawny-orange* and widely striate on the margin when moist, tawny and shining when dry. FLESH dingy white, tinged with yellow. GILLS broad, ventricose, adnate, with a broad, shallow emargination, somewhat rugose on the sides, *yellowish,* becoming cinnamon. STEM 7-10 cm. long, 6-8 mm. thick, elongated, subequal, *viscid,* even, silky, solid, *white or whitish.*" SPORES almond-shaped, rough-tuberculate, 14-17 x 7-9 micr. (rarely up to 18.5 micr. long).

"Mossy ground under balsam trees. Wittenberg Mountains, New York. September."

This species appears to have the stature of *C. cylindripes,* but has larger spores and lacks the violaceous color entirely. The spores of the type specimens are larger than given by Peck in the original description. The color of the pileus is similar to that of *C. mucifluus* Fr.

Cortinarius splendidus Pk. (N. Y. State Mus. Rep. 29, 1878), differs from *C. muscigenus* in smaller size and *violaceous stem.* Its

spores are similar, 15-18 x 6-8 micr., larger than given by Peck. The dried type specimens indicate that they are closely allied, and that one is a variety of the other.

Cortinarius elatior pallidifolius Pk. is also probably a variety of *C. muscigenus* Pk. The spores are the same, 15-17.5 x 7.5-9 micr., but the *stem is tinged with lilac.* Both varieties have a shorter stem than *C. muscigenus,* and the caps are said to be pale fuscous, although in the dried specimens they have the same shining, tawny-tan color as in that species. The last variety is described and figured in N. Y. Mus. Rep. 54, 1901.

312. Cortinarius submarginalis Pk.

N. Y. State Mus. Bull. 54, 1902.

Illustrations: Ibid, Plate L, Fig. 6-10.

"PILEUS 5-10 cm. broad, firm, convex becoming nearly plane, concave by the elevation of the margin, viscid when moist, *yellowish-brown,* generally *a little paler on the rather definite and commonly fibrillose margin.* FLESH whitish. GILLS thin, close, rather broad, adnate, creamy-yellow when young, soon cinnamon. STEM 7-15 cm. long, 8-12 mm. thick, elongated, equal or slightly thickened at the base, solid, silky-fibrillose, *slightly viscid,* whitish or pallid." SPORES almond-shaped, slightly rough, 10-12.5 x 5-6 micr.

"Low moist places in Woods. Bolton, New York. August. The margin is separated from the rest by a definite line, is 6-12 mm. broad and conspicuously fibrillose." The description is adopted from that of Peck.

313. Cortinarius sphærosporus Pk.

N. Y. State Mus. Rep. 26, 1874.

Illustration: Plate LXV of this Report.

PILEUS 3-7 cm. broad, hemispherical-convex then expanded-plane, glabrous, even, *with a thick gelatinous straw-yellow pellicle,* which is glutinous when moist. FLESH thin on margin, *violaceous at first,* soon pallid. GILLS *violaceous at the very first, soon whitish* then cinnamon, adnate-subemarginate, close, rather broad. STEM 5-10 cm. long, 5-8 mm. thick, subclavate or tapering upward, equal above, spongy-stuffed, *glutinous when moist from the thin universal veil, which on drying leaves thin yellowish patches on the lower*

portion, apex at first pale violaceous, soon white. SPORES oval-subglobose, slightly rough-punctate, 6-7.5 x 5.5-6.5 micr.

In low, moist woods or swamps. August-September. Coniferous regions. Infrequent.

This species corresponds closely with the European *C. delibutus* Fr. which also has subglobose spores. In the American plant the spores are constantly a little smaller, as shown by two collections from Sweden. In that species the spores measure 7-8.5 x 6-7 micr. Britzelmayr reports under the name *C. delibutus,* a species with spores 14-16 x 6 micr. Such a plant, with all other characters similar to *C. delibutus* Fr., has been collected by me, but not sufficient data are at hand to describe it. It is possible that *C. berlesianus* (Pk.) Sacc. of which the spores of the type specimens measure 7-8 x 6-6.5 micr., is a form of the European *C. delibutus* Fr., but its stem has a rounded bulb.

314. Cortinarius vibratilis Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Plate 744.
Gillet, Champignons de France, No. 256.
Ricken, Blätterpilze, Pl. 35, Fig. 2.

PILEUS 2-5 cm. broad, *surface bitter to the taste,* convex, obtuse, gibbous, *with a glutinous pellicle,* hygrophanous, *yellow, ochre-yellow to fulvous-yellow,* paler when dry, glabrous, even. FLESH soft, thin except disk, white or whitish, *bitter.* GILLS *adnate to slightly subdecurrent* or subemarginate, thin, close, rather narrow, *pallid to pale ochraceous,* then pale ochraceous-cinnamon. STEM 3-7 cm. long, variable in length, 4-10 mm. thick, subclavate or tapering either way, *soft, pure white, clothed when young by a glutinous, hyaline, universal veil* which soon dries, often viscid only at base, soft-stuffed. SPORES narrowly elliptical, almost smooth, 6-7.5 x 4-5 micr. BASIDIA 26-28 x 7 micr., 4-spored. ODOR mild or subaromatic. TASTE of *every part intensely bitter.* CORTINA white.

In conifer and frondose woods, among leaves or humus. Throughout the State. August-September. Infrequent.

The American plant, named *C. amarus* by Peck, does not differ from *C. vibratilis* Fr. as it occurs around Stockholm. The spores, bitter taste of all parts and the hyaline gluten of the universal veil are the same. *C. amarus* Pk. was originally referred to the subgenus Phlegmacium (N. Y. State Mus. Rep. 32, p. 30, 1879) but

later, Dr. Peck referred it to its proper position. *C. vibratilis* is distinguished by its pure white stem, pallid gills and yellow cap; the last may take on fulvous or rufous brown hues on the disk. An occasional individual of larger dimensions occurs. The stem varies in length and shape, and in mossy wet places often becomes more elongated. The gluten often drips from the edge of the cap in moist weather and on drying the cap becomes shining. This species might be confused with *C. causticum* Fr., unreported in Michigan, in which only the viscid pellicle of the pileus is bitter. Two other European species, *C. emollitus* Fr. and *C. crystallinus* Fr. possess bitter flesh and somewhat similar colored caps, but they belong to the subgenus Phlegmacium and their stems are not pure white.

315. Cortinarius sterilis Kauff.

Torr. Bot. Club Bull., Vol. 32, 1905.

Illustrations: Ibid, Fig. 1, p. 304.
Jour. of Mycol., Vol. 13, Pl. 96, p. 36, 1907.
Mycol. Bull., Vol. 5, Fig. 242, p. 316, 1907.

PILEUS 1.5-4.5 cm. broad, suborbicular when young then convex-expanded, margin incurved, drab, *drab-gray to olive buff,* even, smooth, *viscid,* somewhat umbonate at times. FLESH white, soft, thin. GILLS relatively broad, 4-6 mm., drab-gray at first, then light-cinnamon, rounded behind, then emarginate, not at all ventricose, rather crowded, edge serratulate and white, later eroded, *provided with sterile cells.* STEM 4-8 cm. long, 4-6 mm. thick, at base up to 10 mm., clavate or tapering upward, solid, spongy, or tapering upward, dingy-white, tinged with light blue toward apex, clothed when fresh with the delicate patches of the *viscid,* universal veil, which is of the same color as the pileus, within pale bluish at apex, white below. SPORES subsphoeroid, almost smooth, 6-7 x 5-6.5 micr. CORTINA white or sordid.

Gregarious in swamps of cedar, etc. Bay View. August-September. Rare.

The spores and the peculiar color of cap and veil distinguish this species. It has been found only twice, in low, wet, sphagnous or mossy swamps. Its name refers to the sterile cells on the edge of the gills.

316. Cortinarius iodes B. & C.

PILEUS 2-6 cm. broad, campanulate-convex, glabrous, even, *with a tough, viscid, separable pellicle, dark violet to purplish,* at length often yellowish on the disk. FLESH thick on the disk, abruptly thin on the margin, violaceous then paler. GILLS adnate, close, moderately broad, *violaceous at first,* then gray-cinnamon. STEM 5-7 cm. long, equal or clavate-thickened or tapering to either end, 4-8 or 5-15 mm. thick, *viscid,* solid, subfibrillose. CORTINA pale violaceous. SPORES broadly-elliptical, minutely rough-punctate, 8-10 x 6-6.5 micr. TASTE *mild.* ODOR none.

Gregarious or subcaespitose. On the ground in low, wet places in woods. August. Detroit. Infrequent.

This is very similar in color and stature to *C. iodeoides* but lacks the bitter taste of the pellicle of the cap. The color is deeper and the spores are larger than in that species. It appears to be related to the European *C. salor* Fr. which has similar colors but whose spores are truly spherical. It has been received from the eastern part of the United States where it occurs more frequently.

317. Cortinarius iodeoides sp. nov.

Illustration: Plate LXVI of this Report.

PILEUS 2-5 cm. broad, convex then expanded, broadly umbonate to plane, *deep lavender-violet or bluish-violet when young or fresh,* fading to livid-ashy, sometimes faintly yellowish or buff-spotted, *with a bitter pellicle which is glutinous* when moist or young, glabrous, even. FLESH at first pale violaceous, soon white, thin on margin, thickish on disk. GILLS adnate then emarginate, rather narrow, close, pale violaceous, *soon whitish,* at length pale ochraceous-cinnamon. STEM 2-6.5 cm. long, clavate-thickened at base or variously thickened or subcompressed, 4-8 mm. thick, white but *covered when young by the thin, delicately violaceous, glutinous, universal veil,* stuffed, silky or glabrous. SPORES elliptical, almost smooth, 7-7.5 x 4-4.5 micr., pale ferruginous-cinnamon in mass. ODOR none or slight. TASTE of flesh mild, *of pellicle of pileus bitter.*

Subcaespitose or gregarious. Among leaf-mold, often hidden by leaves, in frondose woods of maple, oak, etc. August-October. Ann Arbor, New Richmond. More frequent than the preceding.

This species is easily confused with the preceding, but is clearly distinct because of the bitter surface of the cap which is quickly

recognized, and the different spores. A more careful comparison shows slight differences in the colors. It is often hidden by the leaves, especially in the late fall.

318. Cortinarius heliotropicus Pk.

N. Y. State Mus. Bull. 94, 1905.

Illustration: Ibid, Pl. P., Fig. 1-7.

"PILEUS 2.5-6.5 cm. broad, broadly campanulate, convex or nearly plane, fibrillose, *viscid, heliotrope-purple, generally spotted or variegated by yellowish-white spots.* FLESH whitish, thin. GILLS narrow, thin, close, rounded behind, adnexed, *concolorus with the pileus when young,* cinnamon when mature. STEM 3.5-7 cm. long, 4-8 mm. thick, *firm,* solid or spongy within, usually slightly thickened at base, silky-fibrillose, *viscid, whitish and spotted with purple or colored like the pileus,* white within. SPORES 10-12.5 x 5-6 micr., elliptic. TASTE mild or slightly acrid. ODOR slightly of radish.

"In woods. Smithtown, New York. August.

"This is one of the most beautiful species of Cortinarius. In some specimens the spots on the pileus are large or confluent, in others they are almost or entirely absent, but usually they are small and distinct. The purple color of the gills is persistent for some time. In large specimens the margin is sometimes adorned by fibrillose scales of the veil."

This and the two preceding are all of medium size and beautifully colored. The description and notes are adopted from Peck. This species seems to differ from *C. iodes* mainly in the larger spores and perhaps in taste and color.

SUBGENUS BULBOPODIUM: Stem dry, *at first hidden,* then usually stout, with a thick, abrupt, marginate-depressed bulb, to whose margin is attached the cortina; the universal veil is either manifest or lacking in the young stage. Pileus with a *viscid* pellicle; equally fleshy.

This is the section "Scauri" of Fries. The structure of the bulb and the development of the stem is unique among the Cortinarii, and the group deserves equal rank with the other subgenera. The "button" stage of the young plant consists only of pileus and bulb, the former smaller than and closely pressing on the bulb. The rest of the stem is invisible, since its beginnings are enclosed

undeveloped under the pileus. The margin of the pileus rests on the broad bulb and produces the typical, abruptly depressed edge of that body. The cortina extends from the margin of the pileus to the bulb, to whose upper surface it is attached and, during development, is carried up on the lower part of the elongating stem. The universal veil when present envelops the bulb and extends to the surface of the pileus in the form of a thin, slightly woven membrane, which breaks away in a circumscissile manner from the margin of the pileus at an early stage and is only noticeable, after the expansion of the plant, on the exterior of the bulb or where the torn fringes of its upper portion extend above the margin of the bulb and lie against the stem; it is usually of the same color as the surface of the pileus and this shows on the bulb and on the stem immediately above it. Sometimes this veil is slightly gelatinous. Species occur which are intermediate between this and the following subgenus, where the bulb is scarcely depressed or marginate, or where the margin of the pileus almost covers the slight bulb so that the latter is margined only about its base. The stem is never peronate nor annulate by the universal veil in this subgenus. The connection of the margin of the bulb with the cap and the circumscissile manner in which the universal veil breaks across are somewhat similar to the conditions in some Amanitas.

The species of this group are numerous, and many more will probably be found in Michigan. Fries appears to apologize for including and naming so many species under the section Scauri, as witness his remarks under that section in Epicrisis: "An astonishing number of closely related forms, which, although they were all constant, I was ashamed to separate in Sys. Myc., but published them under titles which were much broader. But I am compelled to recognize them lest the limits appear to be arbitrary, since their existence in nature has been verified many times." Not a few others have already been found in the State, but their identity is not yet established.

Section I. Universal veil present.

**Gills, flesh or stem at first violaceous, bluish, or purplish, rarely olivaceous or white.*

319. Cortinarius atkinsonianus Kauff. (EDIBLE)

Bull. Torr. Bot. Club, Vol. 32, p. 324, 1905.

Illustrations: Ibid, Fig. 6, p. 316.
Jour. of Mycol., Vol. 13, Plate 99, p. 36, 1907.
Plate LXVII of this Report.

PILEUS 6-9 cm. broad, convex then expanded, *wax-yellow or flavus at first,* tinted with olivaceous, then alutaceous or reddish-tawny in places, with a *viscid separable pellicle,* glabrous, even. FLESH thick, rather soft, *at first deep violet* or lavender, slowly fading. GILLS adnate becoming slightly sinuate, rather narrow, width uniform, *deep violet or purplish at first,* edge sometimes olivaceous-yellowish, at length cinnamon. STEM 6-8 cm. long, stout, 12-18 mm. thick, *deep violet or violaceous blue,* concolor within, solid, dry, equal or tapering upward from a rather thick, marginate, broadly turbinate *bulb* up to 3 cm. thick, and externally clothed by the *olivaceous-yellow universal veil,* apex of stem fibrillose, elsewhere hung with the fibrillose remains of the *olivaceous-yellow cortina.* SPORES almond-shaped, elliptical, *very tuberculate,* 13-15 (rarely 16) x 7-8.5 micr., rusty-cinnamon in mass.

Gregarious. In leaf-mould or among fallen leaves, in rich, mixed or frondose woods. Ann Arbor, Detroit, New Richmond. September-October. Infrequent.

This noble species is the prince of known American Cortinarii. Several collections in all stages of development have made it possible to emend the original description and refer it to its proper place in the genus. The colors of the fresh plants are vivid and most beautiful. The flesh is at first intense violet, and by peeling the pileus this color is at once exposed under the yellow pellicle. There is an olivaceous tinge in the yellow color of the pileus, cortina and universal veil in the young plant, and the edge of the gills may also be laved with the olivaceous-yellow coloring. The taste and odor are mild. It seems closely related to *C. arquatus* Fr. in the sense of Ricken, from which it differs mainly in its intensely violet or purplish flesh. The figure of Ricken (Blätterpilze, Pl. 36, Fig. 4) however, gives a very inadequate conception of our plant. It is barely possible that this is the American form of that species.

320. Cortinarius calochrous Fr.

Syst. Myc., 1821 (segregated, Epicrisis, 1836-8).

Illustrations: Gillet, Champignons de France, No. 200.
Plate LXVIII of this Report.

PILEUS 3-6 cm. broad, *not large,* convex, soon expanded-plane, *bright ochre-yellow to citron-yellow,* fulvous on disk, *with a viscid pellicle,* glabrous, even. FLESH thickish, rather compact, whitish. GILLS emarginate-adnexed, crowded, thin, rather narrow, *rosy-violet to violaceous-purple at first,* at length pale clay-cinnamon, *edge serratulate.* STEM 3-5 cm. long, 5-9 mm. thick, solid, pale violaceous or whitish at first, soon becoming dingy yellowish, equal above the *rather small, abrupt, marginate-depressed, shallow bulb,* which is clothed at first by the *yellow universal veil.* SPORES subinequilateral, elliptical, 8-9 (rarely 10) x 4-5.5 micr., cinnamon in mass. BASIDIA 28-30 x 7-8 micr., 4-spored. ODOR and TASTE mild.

Solitary or scattered. In low, rich woods of maple, beech, etc. Ann Arbor. September-October. Infrequent.

A medium-sized plant, never becoming large. Known by its peculiar bulb which, in the typical condition, has the shape of a small porcelain evaporating disk with a rim, into which the stem appears inserted. Shreds of the yellow universal veil cling to the rim and the base of the stem. The plant is excellently figured by Fries in the unpublished plate in the Royal Museum at Stockholm, showing the remains of the universal veil. Gillet's figure is also accurate as to color and shape. Cooke's figure (Ill., Plate 713) cannot apply to our plant. Ricken, Saccardo and Britzelmayr give spore-measurements which indicate a related species with much larger spores.

321. Cortinarius velicopia sp. nov.

PILEUS 6-9 cm. broad, convex at first, soon broadly expanded to plane, *violet to buff at first, becoming dingy yellowish-ochraceous* as if stained, with a viscid, separable pellicle, even, glabrous, margin incurved and at first appendiculate from the copious cortina. FLESH pale blue-violaceous, *soon white,* thick, moderately compact.

GILLS narrowed behind, narrowly adnate, moderately broad, close, at length dingy yellowish or pallid, hung with the fibrillose remains then cinereous, finally rusty-cinnamon, *edge minutely fimbriate.* STEM 6-8 cm. long, 8-18 mm. thick, *violaceous-blue, fading to bluish,* at length dingy yellowish or pallid, hung with the fibrilllose remains of the cortina, dry, equal, solid, *with a marginate, subdepressed, hemispherical bulb,* which is clothed by a thin, ochraceous-buff, universal veil. CORTINA very copious, white or faintly bluish. SPORES ventricose-elliptical, *with a prominent, papillate apiculus, very tuberculate,* rather symmetrical, 9-12 x 6-7 micr. Edge of gills provided with inflated, sterile cells. ODOR and TASTE mild.

Gregarious or subcaespitose. Among fallen leaves in mixed or frondose woods. Ann Arbor, New Richmond. September-October. Infrequent.

This may be considered a segregate of *C. caerulescens,* and corresponds to Ricken's description of that species (Blätterpilze, p. 129), but is different from the conception of Maire (Bull. d. la. Soc. Myc. de France, Vol. 27, p. 426) and that shown by the Friesian unpublished plates. The spores of our plant, as well as the very abundant cortina, are quite distinguishing. The colors of the gills and stem incline to blue. Several collections show that the pileus may be deep violet at first in some forms, but eventually the ochraceous-buff color of the universal veil pervades also the surface of the pileus. The universal veil is less manifest and less persistent than in the preceding species.

322. Cortinarius herpeticus Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 849.
Ricken, Die Blätterpilze, Pl. 37, Fig. 4.

PILEUS 3-10 cm. broad, convex, subexpanded, firm, smoky-olive or *olivaceous,* tinged brownish on disk, fading, *with a viscid, separable pellicle,* even, glabrous, margin at first incurved, thin. FLESH thickish, firm, abruptly thin on margin, evanescently violaceous, then whitish. GILLS rounded behind, adnexed-emarginate, close, moderately broad, smoky-violet or *olivaceous* at first, smoky-brown at length clay-color (Ridg.), then smoky-cinnamon. STEM 3-5 cm. long, 8-18 mm. thick, solid, *violaceous-blue at first,* fibrillose by the *whitish cortina,* equal above the marginate-depressed bulb, which

is covered by the remains of a greenish or whitish, thin, universal veil, bulb 1-2 cm. thick. SPORES broadly elliptical, rough, 8-10 x 5-6 micr. ODOR and TASTE mild.

Gregarious. Among mosses in cedar and balsam swamps. Bay View, Michigan, and North Elba, New York. August. Rare.

This was considerd a new species in the "Key" (Jour. of Mycol. 13, p. 35, 1907) as *C. olivaceoides.* It agrees well with the Friesian species as characterized in Monographia. In the 11th Report of the Mich. Acad. Sci., p. 32, it is reported as *C. olivaceus* Pk. *C. olivaceus* Pk. has larger spores and belongs to the section Phlegmacium. *C. herpeticus* appears to be close to *C. scaurus* Fr.

323. Cortinarius olivaceo-stramineus Kauff.

Bull. Torr. Bot. Club, Vol. 32, 1905.

Illustrations: Ibid, Fig. 3, p. 309.
Jour. of Mycol., Vol. 13, Pl. 95, 1907.
Mycological Bull., Vol 5, Fig. 243, p. 317, 1907.

PILEUS 4-7 cm. broad, broadly convex, slightly depressed in the center when expanded, *pale straw-yellow with an olivaceous tinge,* slightly rufous-tinged in age, glabrous or silky-fibrillose, disk sometimes covered with minute scales, *viscid from a gelatinous pellicle,* margin incurved at first, shreds of the cortina attached to it on expanding. FLESH very thick, abruptly thin on margin, *white,* dingy-yellowish in age, *soon soft and spongy.* GILLS sinuate-adnexed, rather narrow, crowded, *whitish at first,* then pale cinnamon, edge serratulate and paler. STEM 6-8 cm. long, 5-18 mm. thick, spongy and soft within, sometimes becoming hollow, white and pruinate above the fibrillose remains of the cortina, *with a slight, subobsolete, submarginate* bulb from whose margin arises the copious white CORTINA; bulb when young covered by a thin universal veil of the same color as the pileus. SPORES ventricose-elliptical, with stout apiculus, almost smooth, granular within, 10-12 x 5.5-6.5 micr. BASIDIA about 38 x 9 micr. ODOR and TASTE mild.

Subcaespitose. On the ground in mixed and frondose woods. August-September. Ann Arbor. Rather rare.

It is with some hesitation placed in this section, as the universal veil is not well developed. The bulb is at first slightly marginate and the cortina is attached to it; later the bulb almost disappears

at times. The plants are sometimes deformed by a fungous parasite, *Mycogone rosea,* causing the gills to remain sterile. It has been found in several states, but is apparently rare.

324. **Cortinarius cæsiocyaneus** Britz. (Edible)

Bot. Centralbl., 1895, p. 10, 1899, p. 58.
Maire, Bull. de la. Soc. Myc. de France, 26, 1910.

Illustrations: Maire, Bull. de. la. Soc. Myc. de France, Vol. 26, Pl. 8, Fig. 1-2.

PILEUS 5-12 cm. broad, convex then expanded-plane, sometimes depressed on the center, *bluish-violaceous-white to silvery-violaceous,* glabrous, even, *with a viscid, separable pellicle,* silky-shining when dry, margin becoming silky and at first incurved. FLESH pale violet, fading slowly, thick. GILLS rather *narrow, adnexed,* rounded behind then sinuate, thin, *pale violaceous, soon pale alutaceous,* then cinnamon, crowded, edge even or becoming eroded. STEM stout, 4-7 cm. long, 1-2 cm. thick, solid, pale violaceous-white, concolor within, equal above *the large, flattened, marginate-depressed bulb,* which is white on the surface from the *white universal veil,* attached to white mycelium. CORTINA *violaceous-white.* Spores 10-12 (rarely 13) x 6-7 micr., almond-shaped, elliptical, tuberculate, cinnamon in mass. ODOR and TASTE mild.

Gregarious or subcaespitose. On the ground among leaves in frondose woods of oak, maple, etc. Ann Arbor. September-October. Infrequent.

This is a segregate of *C. caerulescens* Fr. The whole plant has a rather uniform pale violaceous-whitish color almost exactly like *C. michiganensis.* As in that species, the gills are not at first intensely colored nor at all purple or rosy. It has the large size of *C. atkinsonianus* with which it sometimes occurs. The flattened bulb is white below and on the sides, where it is clothed by the white subgelatinous veil. The spores are larger than in *C. michiganensis* with which it is easily confused and which belongs to another section. Cooke's figures of *C. caerulescens* (Ill., Pl. 721) show the stature and color, but not the characteristic bulb and spores; that plate is referred by Maire (Bull. de la Soc. Myc. de France, Vol. 26, p. 18) to *C. caesiocyaneus* Britz. Ricken places this plant under *C. camphoratus* Fr. but without any good grounds.

325. **Cortinarius rubens** sp. nov.

PILEUS 3-7 cm. broad, hemispherical then convex-expanded, *vermillion-red to orange-fulvous,* unicolorous, *with a viscid, separable, toughish pellicle,* glabrous, even, shining when dry. FLESH thick, whitish. GILLS adnexed, becoming emarginate, rather broad, close, caesious or pale drab at first, then argillaceous-cinnamon, edge entire and tinged dull citron-yellowish. STEM 4-7 cm. long, 1-1.5 cm. thick, solid, dry, *pale straw-yellow to whitish,* citron-yellowish within, fimbriate from the cortina, equal above the *rounded, marginate-depressed bulb* which is clothed by the *vermillion-red universal veil* except below where it is white and attached to white mycelium. SPORES almond-shaped, very inequilateral, tuberculate, 15-18 x 7-8.5 micr. BASIDIA 45 x 13-15 micr., stout, 4-spored. CORTINA white or tinged with red. ODOR faintly aromatic. TASTE of flesh bitterish-disagreeable, slowly more intense.

Gregarious or subcaespitose. On the ground among leaves in frondose woods of oak, maple, etc., its mycelium attached to *mycorhiza* of undetermined roots. Ann Arbor. October. Rare.

The bright red color of the pileus and the universal veil is striking and is rarely seen in this subgenus. The veil is very evident on the fresh plants and shows on the margin of the bulb as a bright red to orange-red decoration, and in the button stage is continuous with the pellicle of the pileus, breaking in a circumscissile manner like the yellow veil of *C. atkinsonianus.* There is no violet or purple present in the cap although the young gills have a dull violaceous-gray tint called "caesious." The edge of the gills is citron-straw-yellow and, when seen from below, gives the impression of that color to the rest of the gills. It differs from *C. sublateritius* Pk. in its much larger spores and the distinct universal veil. It agrees closely with the description of *C. testaceus* Cke., except in details. Maire, however, says Cooke's plant is identical with *C. rufo-olivaceous* Fr. to which our plant cannot be referred, although related to it. Specimens of our species have also been received from Madison, Wisconsin.

***Gills, flesh and stem yellow at first.*

326. Cortinarius elegantioides sp. nov.

Illustration: Plate LXIX of this Report.

PILEUS 4-7 cm. broad, convex then expanded-plane, *cadmium-yellow, orange-fulvous on disk,* becoming fulvous-ferruginous in age, glabrous, even, *with a glutinous separable pellicle.* FLESH thick, whitish or tinged greenish-yellow. GILLS adnate, becoming deeply emarginate and uncinate, close, *rather broad, varying pale yellowish-white, bright citron-yellow or sulphur-yellow,* at length ferruginous, thin, edge minutely crenulate. STEM 5-8.5 cm. long, rather stout, subequal, 10-18 mm. thick, dry, spongy-stuffed, yellowish-white or citron-yellow, *flesh tinged greenish-yellow,* with a marginate, subdepressed, subturbinate *bulb, which is clothed on the surface by the yellow to subferruginous, subgelatinous universal veil.* CORTINA slight, fugacious. SPORES almond-shaped, elliptical, very tuberculate, 15-18 (rarely 19-20) x 7-9 micr. BASIDIA 48 x 12-13 micr., 4-spored. TASTE of flesh tardily but distinctly *bitter.* ODOR mild.

Solitary or subcaespitose. On the ground in frondose woods of oak, maple, etc. Ann Arbor, Detroit, New Richmond. September-October. Infrequent.

Nearly always solitary or of few individuals. Known by its large spores, bitter taste of the flesh and the tinge of green in the yellow color of the flesh, etc. It has the stature of *C. multiformis* of Cooke (Ill., Pl. 708 and 709), but the spores are distinctive. The bulb is not very broad as compared with that of *C. fulgens* Fr.; it is rather soft and decays early. The stem is narrower upwards at first and colors of the stem. It is closer to *C. sulfurinus* Quel. (sense of Ricken) but differs in its spores, less abundant cortina and the colors of the stem. It is closer to *C. sulfurinus* Quel. (sense of Ricken), but neither Quelet nor Ricken mention the bitter taste nor the universal veil.

Section II. Universal veil not manifest.

**Gills, flesh or stem at first caesious, violaceous, bluish or purplish.*

327. Cortinarius purpurascens Fr. (Edible)

Epicrisis, 1836-38. Obs. 2, 1818.

Illustrations: Cooke, Ill., Pl. 723.
Gillet, Champignons de France, No. 224.
Plate LXXI of this Report.

PILEUS 5-8 cm. broad, broadly convex to subexpanded, *dark purplish-umber or entirely violet-purple when young,* soon discolored and variegated with clay-color or brown, opaque, glabrous, even, *with a viscid, separable pellicle.* FLESH thick, compact, tinged azure or purplish, fading to whitish in age, *but changing rapidly to deep purple when bruised.* GILLS adnexed and rounded behind, then emarginate, rather narrow, close, at first azure-blue or darker, *changing to deep purple when bruised.* STEM usually short, stout, 2-5 cm. long, 10-20 mm. thick, *solid,* subequal, fibrillose from the cortina, *bulb not large, subemarginate* to distinctly marginate, scarcely ever depressed, soon oval, purplish, *flesh quickly deeper-colored when bruised.* SPORES 8-9.5 (rarely 10) x 5-5.5 micr. elliptic-ovate, rough-echinulate, dark in mass. BASIDIA 40-45 x 8-9 micr., 4-spored. ODOR and TASTE mild.

Gregarious, solitary or subcaespitose. On the ground in open woods, sometimes in bare, exposed places where soil is hard. Ann Arbor, Detroit. September-October. Infrequent.

The American plant has more purple in the pileus than shown in my collection from Sweden and as given by European authors. In all other respects it agrees with that of Europe. This is *C. subpurpurascens* in the sense of Ricken. The spore-measurements as given by Massee are too large. We have three related species which might be easily confused by not taking account of the spores: *C. aggregatus* has smaller spores and its flesh and gills do not change to purple when bruised. *C. sphaerosperma* is a much larger plant, with almost spherical spores. The common form of *C. purpurascens* is small, stout and squatty, although more luxuriant specimens occur in favorable weather.

328. Cortinarius subpurpurascens Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 725.
Ricken, Blätterpilze, Pl. 36, Fig. 3. (As *C. purpurascens.*)

PILEUS 5-10 cm. broad, firm, campanulate, discoid or gibbous, then expanded, at length depressed, *viscid, tinged* purple at first, yellow-ochre to ochraceous tawny with smoky-brown stains, scarcely virgate, glabrous, *zoned by the decurved margin.* FLESH soon whitish, *not changing* to purple when bruised, compact. GILLS adnexed-emarginate, crowded, rather narrow, purplish at first then pecan-brown (Ridg.), *becoming purplish when bruised,* edge entire. STEM 5-7 cm. long, 10-15 mm. thick, subequal above the rather small depressed-marginate flattened bulb, pale violaceous, *purplish where bruised,* violaceous within, cortinate-fibrillose, *stuffed then tubular.* SPORES elliptical-oval, 8-9 x 5-6 micr., rough. ODOR slightly of radish after picking, somewhat pungent. TASTE mild.

Gregarious to subcaespitose. On the ground under balsam and spruce. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Infrequent.

This species differs from *C. purpurascens* in its habit, its stuffed to hollow stem and the almost immutable color of the flesh. The gills and stem, however, change to purplish where bruised. It is *C. purpurascens* in the sense of Ricken who seems to have exchanged the Friesian names. It seems to be a species of the higher mountains, and perhaps of the northern forests.

329. Cortinarius aggregatus sp. nov.

PILEUS 5-12 cm. broad, convex then subexpanded, obtuse and usually irregular from crowding, at length undulate, glabrous or white-pruinose when young, *at first bright purple-blue* to purplish-gray, at maturity *becoming smoky olive-gray and streaked,* with a viscid pellicle, margin at first incurved. FLESH thick, *violaceous* then faintly olivaceous-gray to dingy white, *not turning purple when bruised.* GILLS adnexed and rounded behind, then emarginate, close, moderately broad, *violet-purple at first,* then gray to cinnamon. STEM 4-7 cm. long, 10-20 mm. thick, rather short, solid, dry, purplish, darker at base, *the small bulb at the very first subemarginate,* not depressed, disappearing during development. CORTINA *deep violaceous,* rather copious, *attached to bulblet at first,* collapsing on the stem. SPORES narrowly elliptical, 7-8 x 4-4.5 micr. ODOR and TASTE mild.

Caespitose, often in troops forming arcs of scores of individuals. In frondose woods of oak, maple, etc., in the late fall after heavy rains, half hidden by the leaves.

September-November. Ann Arbor. Infrequent, in very wet seasons.

This species is usually quite abundant in its particular woods. As the clusters or closely crowded rows of the fruit-bodies develop, they push up the thick mat of leaves in humps, an appearance which is very commonly produced in frondose woods by the late-growing mushrooms. The young clusters may be so thoroughly hidden by the leaves that they are usually not found till more or less expanded and the changes in color by that time are often extremely confusing. In that case the deep bluish-purple color of the young cap is lost and in the expanded state its surface assumes a distinct olive-gray color and is then often markedly streaked with darker shades. The bulb becomes soft, is often infested by grubs and stained yellowish. It differs from *C. purpurascens* in habit, in different shade of blue on the cap and stem, in the flesh not changing to darker purple when bruised and in the smaller spores. A vigorous cluster of young plants are intensely colored, and often silvery as if covered with hoar-frost. It is related to *C. cyanopus* Fr.

330. Cortinarius sphaerosperma sp. nov. (Edible)

Illustration: Plate LXX of this Report.

PILEUS 8-16 cm. broad, *large,* broadly convex-expanded, with a *very viscid,* separable pellicle, glabrous, even, *deep violet-purple,* micaceous-shining when dry. FLESH soon whitish, *changing* to *purple when bruised,* thick, compact. GILLS adnate *then sinuate-subdecurrent,* crowded, not broad, *purple at first,* then rusty-umber. STEM 6-9 cm. long, 15-20 mm. thick, solid, stout, dry, hung with the dense, spore-stained fibrils of a very copious, purplish CORTINA, *deep purple* like the cap, *the rather small bulb subemarginate and disappearing,* at length clavate-bulbous, whitish within, becoming purple when bruised. SPORES spherical or subsphoeroid, very tuberculate-rough, 7-8.5 x 6-7.5 micr., dark ferruginous in mass. BASIDIA 30 x 9 micr., 4-spored, the slender sterigmata 3-4 micr. long. ODOR slightly of radish. TASTE mild.

Solitary or scattered. On the ground in frondose woods of oak,

maple, etc. August-September. Ann Arbor, Detroit. Rather rare.

This magnificent species has only been seen thrice. It was at first passed by as *C. purpurascens* but a careful examination revealed important differences. It may be considered as a segregate of that species, although very likely it is a native of this country. No European author seems to have referred spherical spores to *C. purpurascens* or *C. subpurpurascens,* and in the European plants, both of these species entirely or partly lack the purple color of the cap. No very young specimens were found, and it needs further study. Both this species and the preceding approach the next subgenus in the scarcely marginate bulb.

331. Cortinarius purpureophyllus sp. nov.

PILEUS 5-8 cm. broad, convex-expanded, *dull tawny-red,* fading to ochraceous-fulvous, glabrous, even, *with a viscid,* separable pellicle, margin incurved. FLESH whitish, thick, compact. GILLS rounded behind and adnexed, deep *lilac-purple, color persistent,* narrow, crowded, thin, edge entire or suberoded. STEM 4-6 cm. long, 12-18 mm. thick, equal or slightly narrower upwards, *pallid or slightly tinged* lilac-violaceous at first, spongy-stuffed or solid, fibrillose from cortina, apex violaceous within, *with a marginate-depressed, flattish bulb,* which is white throughout, attached to a white mycelium. CORTINA copious, whitish (?). SPORES almond-shaped, elliptical, tuberculate, 10-12 x 6-7 micr., rusty-cinnamon in mass. BASIDIA 36-42 x 8-9 micr., 4-spored. ODOR slight or none. TASTE slowly disagreeable, somewhat bitter.

Gregarious. Among fallen leaves in frondose woods of maple, oak, etc. Ann Arbor. October-November. Infrequent.

Known by the contrasting colors of pileus, gills and stem, and the size of the spores. The flesh is scarcely tinged with violaceous except at the apex of the stem. The young gills have a deep color as in *C. purpurascens,* but the flesh has none of the characteristics of that species.

332. Cortinarius cærulescens Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 722.
Quelet, Grevillea, Vol. VI, Pl. 105, Fig. 3.
Maire, Bull. de la Soc. Myc. de France, Vol. 26, Pl. 8, Fig. 3-5.

"PILEUS 3-6 cm. broad, convex then convex-plane, quite thick, *with separable, viscid pellicle,* glabrous, even, *violaceous-blue, tinged ochraceous on disk,* sometimes entirely ochraceous-yellow, not hygrophanous, margin at first incurved pubescent and white, then spreading and violaceous. FLESH *pale violaceous-blue,* especially under the cuticle, then whitish, at length ochraceous-stained. GILLS arcuate, then plane or slightly ventricose, attenuate in front, rounded behind, thin, *broad,* rather broadly adnate, *violet-amethyst or violet-blue at first,* then rusty-brown, edge serratulate. STEM 3-5 cm. long, 10 mm. thick, cylindric-conic, *with a marginate bulb,* fibrous-fleshy, dry, silky-fibrillose, *violaceous-blue to amethyst-blue,* bulb white, solid. CORTINA violaceous at first. Universal veil rapidly evanescent. SPORES 12-14 x 6-7 micr., subamygdaliform, elliptic, tuberculate. ODOR feeble, like that of *C. purpurascens.* TASTE mild or slightly bitterish."

The description has been adopted from that of Prof. Maire (Bull. de la Soc. Myc. de France, Vol. 27, p. 424, 1911). In America I have seen specimens of this species only from Tennessee. The species stands out from the segregates of the old species as it was variously interpreted, by its large spores. In specimens from Sweden, I find the same sized spores. In size, color of the young gills and in stature it is much like *C. calochrous.* Cooke's figures (Ill., Pl. 721) and Gillet's figures (Champignons de France, No. 208) are referred by Maire to *C. caesiocyaneus,* which they illustrate fairly well. As Fries did not give spore-measurements, I prefer to follow the decision reached by Maire after he had compared the species which occurs near Stockholm, with those of France. Our American references to this plant must be considered as usually, if not always, based on collections of *C. caesiocyaneus, C. michiganensis* or perhaps *C. calochrous.* It is possible that a number of intermediate forms also occur as I have some collections which apparently support such a conclusion.

333. **Cortinarius michiganensis** Kauff. (EDIBLE)

Jour. of Mycology, Vol. 13, p. 35, 1907 (synopsis).

PILEUS 8-14 cm. broad, compact, firm, broadly convex then slowly expanded, *pale violaceous to lilac,* unicolor, *color persistent,* glabrous, even, *glutinous when moist or young,* then viscid, margin persistently inrolled and tomentose-silky. FLESH very thick, white or tinged with lilac, not changed by bruising. GILLS rounded behind and adnexed, or almost free, *narrow, crowded, thin,* acuminate in front, *pale violaceous-white at first,* then pale ashy, finally ochraceous-cinnamon, *edge serratulate from the first.* STEM stout, 3-6 cm. long, 18-30 mm. thick, solid, *pale violaceous-lilac* to whitish, fibrillose from cortina, *marginate-bulbous,* bulb large, up to 4 cm. broad, white beneath, flesh white except the violaceous apex. CORTINA bluish-white, at first attached to the bulb, evanescent, not copious. SPORES narrowly elliptic-ovate, almost smooth, 8-10.5 x 4.5-5.5 micr., pale ochraceous-cinnamon in mass. ODOR and TASTE mild.

Caespitose, in small clusters of large individuals. On the ground, among grass or leaves, in low, rich, frondose woods of beech, maple, etc. Ann Arbor, Detroit, New Richmond. August-October. Infrequent.

This species is known by its large size, caespitose habit, pale gills of which the spores mature slowly, and by the lilaceous color of cap and stem. When fresh or young a clear gluten covers the pileus and sometimes the base of the young bulb, as if by a universal veil. It is very like *C. caesiocyaneus* in size and shape, but has a different habit, different color and spores and lacks the white universal veil of that species. It is doubtless in part the *C. caerulescens* of some American lists. *C. caesius* Clem. according to the description, approaches it, differing in its scarcely viscid pileus, the much thicker spores and the white gills.

334. **Cortinarius cæsius** Clements.

Bot. Surv. of Nebraska, IV, 1896.

"PILEUS 4-8 cm. broad, campanulate-convex, then expanded, fleshy, glabrous, *not or scarcely viscid,* obscurely *dark blue-violaceous,* finally brown-punctate, margin involute. FLESH *bluish-gray,* unchangeable. GILLS adnate, subdistant, *white then cinnamon,* not

violaceous. STEM 1-5 cm. long, 10-15 mm. thick, fleshy-fibrous, solid, violaceous above, *bright yellow below,* turbinate-bulbous, subglobose-when old, bulb 3-4 cm. high and 4 cm. broad, violaceous. CORTINA bluish-gray. SPORES subelliptical or globose, 8-10 x 7-8 micr., verrucose, tawny-brown.

"Related to *C. glaucopus* Schaeff."

The description is adopted from the original. The plant was found in Nebraska and I have not seen it.

335. **Cortinarius aleuriosmus** Maire var.

Bull. de la Soc. Myc. de France, Vol. 26, p. 22, 1910.

Illustrations: Ibid, Pl. 7, Fig. 4-5.
Ricken, Die Blätterpilze, Pl. 39, Fig. 4.

PILEUS 5-10 cm. broad, very compact, firm, broadly convex *alutaceous-whitish at first, soon dingy ochraceous-tan to russet-tan,* sometimes sordid tawny-yellowish in age, glabrous, *with a glutinous pellicle* when moist or young, surface becoming reticulate-rivulose from the drying gluten, margin inrolled at first. FLESH thick, white or with an evanescent violaceous tinge. GILLS adnexed, *narrow,* crowded, *caesious at first* (i. e., pale livid-grayish), sometimes pallid, then rusty-cinnamon, edge erose-serratulate. STEM 4-6 cm. long, *stout, short,* 10-20 mm. thick, solid, compact, *white or scarcely violaceous-tinged,* fibrillose from the cortina, *with a thick, turbinate, marginate bulb,* bulb not depressed, white below and arising from white mycelium. SPORES elliptical-almond-shaped, minutely tuberculate, 10-12 x 5-6 micr. BASIDIA 30-35 x 7 micr., 4-spored. ODOR and TASTE mild or slight.

Subcaespitose or gregarious. On the ground in frondose woods of oak, maple, etc. Ann Arbor. August-September. Infrequent.

This is doubtless the species reported by Ricken under *C. aleuriosmus* Maire. (See Blätterpilze, p. 136, No. 428). Both Ricken's and my collections seem to be the same species, but differ from the description of the type, given by Maire, in lacking the "bitter taste" in the pellicle of the pileus, and in the slightly smaller spores. Maire's species also had a distinct farinaceous odor and no violaceous nor blue tints in the flesh and stem. The latter point, however, is a variation easily overlooked. There is evidently a series of closely related forms, differing slightly in the amount of violet present and the presence or absence of a slight odor and

taste. However, I suspect the species with the bitter pellicle should be kept distinct. Some of my collections had caps which were more tawny or rusty-ochraceous than the descriptions allow. The fundamental characters are the caesious or pale gray-drab young gills, the white flesh of the stem and mostly of the cap, and the spores. This species is a segregate of *C. glaucopus* Fr. and some of my collections agree well with the color, size and shape of the Friesian plates at Stockholm, but the flesh, especially of the stem, does not turn yellowish. The European authors agree that the spores of *C. glaucopus* measure 8-9 x 5-6 micr. Forms occur which have a subaromatic odor, resembling ripe pears. As is often the case in this subgenus, when the plant develops during heavy rains, the glutinous pellicle dissolves away in part, and the pileus is later merely subviscid.

336. Cortinarius glaucopus Fr.

Syst. Myc., 1821.

Illustration: Ricken, Die Blätterpilze, Pl. 35, Fig. 7.

PILEUS 5-12 cm. broad, convex, then expanded-plane, firm, rigid, *often wavy on the geniculate margin,* viscid or glutinous, *variegate fulvous-streaked* on a slate-gray or steel-gray ground-color, *margin greenish-gray,* at first inflexed, disk fulvous. FLESH whitish then yellowish-tinged, thick, compact. GILLS adnexed then emarginate, moderately broad, close to crowded, *at first violaceous-blue,* then clay-cinnamon. STEM 5-10 cm. long (sometimes shorter), 15-25 mm. thick, rigid, pallid with a pale violaceous-blue tinge, *becoming yellowish in age,* flesh violaceous-bluish to whitish then sordid yellowish, solid, almost equal above *the abrupt, marginate, scarcely bulbous base,* attached to a white mycelium. SPORES almond-shaped, subinequilateral, slightly rough-punctate, 8-9 x 4-5 micr. BASIDIA 28-30 x 7 micr., 4-spored. ODOR and TASTE mild.

In dense, caespitose troops. On the ground, under or among leaves, in frondose woods of oak, maple, etc. Ann Arbor. September-October. Abundant locally, but infrequent; after heavy rains.

Only the luxuriant form of this species is known to me. A squatty form is said to occur, probably in dry weather. The colors are difficult to describe and vary during development. The fresh, mature pileus usually has a steel-gray metallic lustre in wet weather, its margin is bent down forming a faint zone, and fulvous shades radiate in streaks from the fulvous center. The bulb is narrow, somewhat thicker than the stem, and scarcely depressed. Its caespitose habit is very marked. No good plate seems to exist. Cooke's figure (Ill., Pl. 712) is entirely misleading, and Gillet's figure (Champignons de France, No. 224), doubtless illustrates another species. It is not at all commmon in the regions I have visited.

***Gills, flesh or stem at first green.*

337. Cortinarius virentophyllus sp. nov.

PILEUS 5-8 cm. broad, convex, expanded-plane, regular, *viscid,* glabrous, *green to olivaceous-yellowish, fading* to pale ochraceous or straw-yellow, sometimes tinged fulvous, slightly streaked by the drying gluten. FLESH thickish on disk, very thin on margin, pallid-greenish, fading, subhygrophanous, with dark watery-green border along the gills. GILLS adnexed-emarginate, thin, close, somewhat narrow, *gray-olive or green at first, becoming deep green,* edge entire. STEM 5-7 cm. long, 10-15 mm. thick, silky-fibrillose at length, *stuffed* by a fibrous pith, becoming hollow, *distinctly cyaneous or pale blue,* fading to violaceous-whitish, bluish within but fading, equal along *the subemarginate bulb,* which becomes oval or subobsolete. SPORES almond-shaped, broadly elliptical, distinctly tuberculate, 9-11 x 6-7 micr. BASIDIA 36 x 9 micr., 4-spored. ODOR mild. TASTE of flesh and pellicle of cap mild.

Subcaespitose in clusters of few individuals. On the ground, among grass in frondose woods of oak, maple, etc. Ann Arbor. October-November. Rare.

This attractive species was found only twice. The cap and gills are deep green when fresh, while the stem is pale blue. The color of the cap and flesh soon fades to pale yellowish except near the gills. The axis of the stem is composed of softer, paler, fibrous tissue which fades quickly and disappears in part leaving the stem tubular. The bulb is not truly depressed-marginate unless in the button stage which was not seen. The species is related to *C. scaurus,* but the pileus is differently colored, not "tiger-spotted," and the stem not solid. The gills and stem are also more brightly colored than in that species. It may be an American variety. The spores agree closely with the measurements given by Ricken for *C. scaurus.* It differs from *C. prasinus* in the glabrous pileus, in stature, and in the spores, which according to Ricken are 13-16 x 6-7 micr. in size. Specimens were seen from Madison, Wisconsin.

****Gills, flesh or stem yellow, fulvescent, or ferruginous.*

338. Cortinarius fulgens Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 716 (doubtful).
Gillet, Champignons de France, No. 223 (doubtful).

PILEUS 6-15 cm. or more broad, firm, broadly convex to plane, bright orange to *orange-fulvous,* disk orange-ferruginous, *somewhat virgate streaked,* very viscid when moist, margin incurved at first. FLESH thick, yellowish then alutaceous. GILLS dilute yellow then *deep ferruginous-orange,* emarginate, *broad,* close, *edge entire.* STEM 4-7 cm. long, 15-25 mm. thick, firm, solid, yellow, *covered by the dense rusty-stained fibrils* of the cortina, equal or subequal above *the large, depressed-marginate bulb.* SPORES almond-shaped, abruptly apiculate, 9-12 x 6-7 micr. ODOR and TASTE mild.

Solitary or subgregarious. On the ground in open beech woods. Ann Arbor. September. Infrequent.

This large species is here interpreted in the sense of Fries as expressed in his unpublished plates at Stockholm. Authors are not agreed as to its identity as shown by their plates, different spore-measurements, etc. Fries' plates show larger plants than indicated in his description, although he says they are "showy, robust and golden." His figures of this and the following species show that the virgate appearance of the pileus of *C. fulgens* was to his mind one of the essential differences. The microscope has shown that probably several species are included under the old ones. Specimens from Bresadola with spores 15-18 x 9-10 illustrate this view. *C. phyllophilus* Pk. (N. Y. State Mus. Bull., 157, 1912), seems to approach our specimens rather closely.

339. Cortinarius fulmineus Fr. var. sulphureus var. nov.

Epicrisis, 1836-38.

Illustration: Plate LXXI of this Report.

PILEUS 5-10 cm. broad, convex then plane, *sulphur-yellow,* scarcely changing to darker, sometimes with spot-like scales on the disk, *viscid,* even, glabrous. FLESH thick on disk, yellow or yellowish-white, rather soft. GILLS adnate, then emarginate, moderately

broad, close, *sulphur-yellow at first,* finally ochraceous-cinnamon, edge becoming eroded. STEM *short,* 3-5 cm. long, 8-18 mm. thick, dry, *pale, sulphur-yellow,* sometimes merely yellowish-white, yellowish within, sometimes compressed, subfibrillose then glabrescent and shining, equal above *the shallow, marginate-depressed bulb* which is yellowish beneath and attached to a yellow mycelium. CORTINA scanty, whitish. SPORES almond-shaped, slightly rough, ventricose, 8-10 x 4-5.5 micr. BASIDIA 30 x 7-8 micr., 4-spored. ODOR none. TASTE mild, of pellicle not bitter.

Solitary or gregarious. On the ground among humus, in frondose or mixed woods. Ann Arbor, Bay View, New Richmond. September-October. Infrequent.

When young the whole plant is pale sulphur-yellow, sometimes paler but uniform in color. In this respect it differs markedly from *C. fulmineus* as described. The figures of the unpublished plates of Fries, however, show a much less orange or fulvous plant than is indicated by the descriptions. It is paler than *C. elegantioides* and lacks the bitterish taste of the pellicle. In the list of the 9th Mich. Acad. Rep. it was referred to *C. sulphurinus* Quel., which differs, in the sense of Ricken, in having much larger spores. Our variety agrees quite closely in the size of the spores with the European *C. fulmineus* as given by Ricken and Saccardo.

340. Cortinarius elegantior Fr. var.

Epicrisis, 1836-38.

Illustration: Ricken, Die Blätterpilze, Pl. 38, Fig. 2.

PILEUS 7-15 cm. broad, compact, firm, convex then expanded, at length wavy and depressed, *tawny-yellow to ferruginous,* glabrous, even, *with a very viscid, separable pellicle.* FLESH whitish or tinged ochraceous, thick. GILLS adnate becoming emarginate, close, rather broad, *yellowish-pallid at first, at length rusty-cinnamon,* edge serrate-eroded. STEM 4-6 cm. long, 10-25 mm. thick, solid, pallid, *becoming rusty-yellow,* fibrillose from the abundant cortina, equal above *the marginate bulb* which is scarcely depressed, *becomes rusty-yellow* and is attached to a yellowish mycelium which forms *mycorhiza.* SPORES almond-shaped, elliptical, tuberculate, 12-14 x 7-8 micr. ODOR and TASTE mild.

Subcaespitose or gregarious. On the ground, among leaves, in frondose woods. Ann Arbor. October. Rare.

This species forms mycorhiza on the red oak; the yellow mycelium was found connecting the mushrooms and the rootlets of the tree and on examination the latter were found to be ectotrophic mycorhiza. Our plants depart somewhat from the descriptions of the European *C. elegantior,* but the spores and color and other major characters are the same. It may be considered as a variety until more extensively collected. It differs from *C. fulgens* in its large spores, the pallid color of the very young gills and stem and the serrate edge of the gills. The color changes markedly to rusty or fulvous as the plant becomes mature. The bulb is not as large and depressed as in *C. fulgens.* In the European plant the color shades slightly into olive, as in our *C. elegantioides.*

341. Cortinarius corrugatus Pk.

N. Y. State Mus. Rep. 24, 1872.

Illustrations: N. Y. State Mus. Mem. 4, Pl. 58, Fig. 8-15, 1900.
White, Conn. State Geol. & Nat. Hist. Surv., Bull. 15, Pl. 21, 1910.

PILEUS 5-10 cm. broad, broadly campanulate, obtuse, *viscid* when moist, coarsely and radiately corrugate or reticulate, *tawny or yellowish-ferruginous,* varying to yellow or ochraceous. FLESH white, thin on margin. GILLS adnate, rather broad, close, *transversely striate,* pallid or obscurely purplish-tinged at first, *soon ferruginous-cinnamon,* edge eroded at length. STEM 7-12 cm. long, 6-16 mm. thick, *long cylindrical,* often fibrillose, spongy-stuffed, often hollowed by grubs, scurfy at apex, yellowish or tawny-yellow, *with a rather small, rounded-oval bulb* which is clothed when fresh by the thin, tawny, adnate and viscid remains of a *universal veil,* pallid or concolor within. CORTINA almost lacking, evanescent. SPORES broadly elliptical, very rough-tuberculate, variable in size 10-15 x 7-10 micr. (usually 12-13 x 8-9 micr.). BASIDIA clavate, 45-48 x 12 micr., 4-spored. ODOR rather pleasant. TASTE mild.

Gregarious or subcaespitose. On mossy or moist ground in low or swampy, frondose woods. Vicinity of Detroit; but probably throughout the State. July-October. Not infrequent in appropriate habitats.

This is a curious species whose early button stage alone shows its relation to the subgenus Bulbopodium. Later there is no margin noticeable on the bulb, and no sign of the early attachment of the cortina. The cortina, in fact, disappears very early, if present at all. In the young stage, however, the cap has a much smaller width than the bulb, and appears to rest upon it in the way characteristic for this sub-genus. The species is easily known by its corrugated cap, the peculiar yellow or tawny-yellow color of the long stem and the large spores. Saccardo quotes the size of spores incorrectly. Peck has named a form with "appressed spot-light scales" on the pileus, var. *subsquamosus.*

*****Gills, flesh and stem at first white, pallid or pale alutaceous.*

342. Cortinarius sublateritius Pk.

N. Y. State Mus. Rep. 54, 1901.

"PILEUS 5-7.5 cm. broad, broadly convex or nearly plane, glabrous, *viscid, light red,* margin incurved. FLESH white. GILLS adnexed, emarginate, close, thin, plane, *pallid at first,* becoming *cinnamon.* STEM short, 3-6 cm. long, 6-10 mm. thick, equal or slightly tapering upward, stuffed, silky, *whitish, abruptly bulbous.* SPORES ventricose-elliptic, abruptly-short, pointed at each end, rough-tuberculate, 10-12.5 x 5-6.5 micr.

"Woods. Westport, N. Y. October."

The description is adopted from that of Peck who says it is apparently related to *C. testaceus* Cke. which, according to Maire is *C. rufo-olivaceus* Fr., but from which it differs in its smaller size, stuffed stem and smaller even spores. It also differs from *C. rubens* in the spore character, as I satisfied myself by a study of the type specimens at Albany, N. Y.

343. Cortinarius multiformis Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 708, 709.
Quelet, in Grevillea, VI, Pl. 104, Fig. 4.
Ricken, Die Blätterpilze, Pl. 39, Fig. 1.
Plate LXXII of this Report.

PILEUS 5-10 cm. broad, soon convex then expanded-plane, regular, *canescent-white-hoary when young, viscid,* soon ochraceous-buff, *becoming pale ferruginous-orange,* with a separable pellicle, at

length somewhat dry and subshining, sometimes wrinkled in age from the drying gluten, margin inrolled. FLESH pallid-white at first, at length somewhat discolored, sublutescent. GILLS attenuate-adnate, then emarginate, close, not broad, *at first whitish, then alutaceous-cinnamon,* edge eroded at maturity. STEM 4-9 cm. long, 10-20 mm. thick, spongy-solid, subfibrillose, *white at first* then alutaceous, equal above the *marginate or sometimes scarcely marginate bulb,* which becomes oval at length. CORTINA *white,* scanty, *fugacious.* SPORES subfusiform-elliptical, scarcely at all rough, 7-9 x 4-5.5 micr., pale, *not becoming rusty.* BASIDIA 25-30 x 7-8 micr. ODOR and TASTE mild.

Gregarious. On the ground, in mixed woods, so far only collected in the conifer regions of the State. Bay View, New Richmond, September. Infrequent.

The button stage is white or whitish throughout, but during development it discolors more or less, assuming yellowish or rusty-ochraceous shades. Our plants never become as deep orange-rusty, so far as I have seen, as do the European plants. Specimens collected near Stockholm, showed a tendency to change from white in the button to tawny-orange in age. The species is distinct from others in the peculiar delicate hoary-white covering of the young plant, which sometimes remains on the surface of the pileus as hoary spots even after expansion. This may be considered as a form of universal veil, but is quite different in texture from the universal veil of the first section. This hoariness is best seen when plants are growing in dry weather, and reminds one of that of *Pholiota caperata.* The spores and gills are rather pale for a Cortinarius, and the species therefore approaches Hebeloma.

344. Cortinarius intrusus Pk. (Edible)

Bull. Torr. Bot. Club, Vol. 23, p. 416, 1896.

Illustration: Plate LXXIII of this Report.

PILEUS 2.5-6 cm. broad, convex-expanded, *soon plane* and subdepressed, glabrous, *whitish to dull clay-color,* sometimes tinged tawny-ochraceous or reddish, *viscid when moist,* even or radiately wrinkled. FLESH whitish, *thin.* GILLS rounded behind, adnexed or almost free, thin, close, not broad, *whitish at the very first,* soon creamy-yellowish to tawny-ochraceous, *finally umber-brown,* edge subcrenulate. STEM 3-6 cm. long, 4-10 mm. thick, *stuffed to hollow,*

whitish, at length stained by the spores, even or striate above, minutely floccose at first, glabrescent, equal or tapering, *more or less abruptly bulbous.* SPORES elliptic-oval, smooth, 6-7.5 x 4-5 micr., brownish-cinnamon in mass. BASIDIA 25-26 x 5-7 micr., 4-spored. Sterile cells on edge of gills, small, capitate, as in Galera. ODOR and TASTE slightly of radish.

Singly or in small clusters in mushroom beds, in flower beds in conservatories, plant pots, etc.

In the winter months. Received from green-houses in Michigan; reported from various points in New York, New Jersey and Massachusetts.

To quote from Dr. Peck, "Its habitat is peculiar, but it possibly finds its way into conservatories and mushroom beds through the introduction of manure or soil or of leafmould from the woods. It seems strange that it has not been detected growing in the woods or fields." McIlvaine says, "Several pints of it were collected in February—usually a famine month for the mycophagist. The crop continued well into the spring. They grew on the ground, in beds among plants, and with potted plants in a hot-house. The species is delicate, savory and a most accommodating renegade of its kind."

This species is not only unusual in its selection of a place to fruit but also departs somewhat from the usual generic characters of the genus Cortinarius. Its spores are of a peculiar color and in some respects it resembles the genus Hebeloma, and may yet be referred to that genus. Its development has not been sufficiently studied.

345. Cortinarius albidus Pk.

N. Y. State Museum, Rep. 44, 1891.

Illustration: Ibid, Pl. 3, Fig. 1-4.

PILEUS 5-10 cm. broad, convex, then expanded, *white or whitish,* even, glabrous, *with a separable, viscid pellicle,* shining when dry. FLESH thick, white. GILLS adnexed-emarginate, moderately broad, close, thin, *white at first,* then pale alutaceous to cinnamon, edge even. STEM 5-8 cm. long, 8-16 mm. thick, solid, *white,* fibrillose from the cortina, *with an oblique, marginate-depressed bulb,* attached to white mycelium. CORTINA white, copious. SPORES elliptical, scarcely rough, 9-11 x 5-6.5 micr. ODOR and TASTE mild.

Gregarious. On the ground in low, frondose woods. Ann Arbor. September-October. Infrequent.

Known by the white color of all its parts, although the pileus may become buff in age and sometimes the bulb is discolored somewhat by rusty hues. It differs from pallid forms of *C. multiformis* in its spores and larger bulb.

SUBGENUS PHLEGMACIUM: Stem dry, firm, *exposed from the beginning,* becoming clavate-bulbous to equal, never marginate-bulbous; cortina superior, collapsing on the upper or medium portion of the stem. Pileus with a *viscid* pellicle.

This includes the sections "Cliduchii" and "Elastici" of Fries. The development from the "button" stage is very different from that of the subgenus Bulbopodium. The stem is evident from the first, and the cortina is necessarily attached differently, connecting stem and margin of pileus. A universal veil, similar in structure to that of the preceding subgenus, may be present in the young stage and in such cases persists under favorable conditions as delicate shreds or as a closely adnate sheath to the lower part of the elongated stem. Of the European species which have this veil, e. g. *C. cumatilis* Fr., *C. varicolor* Fr., *C. triumphans* Fr., etc., only one has been with certainty observed in this country. Details on this point, with respect to American species, are also not at hand, so that I am compelled to arrange our species on a merely temporary basis. The number of Michigan species which belong to this subgenus that have so far been observed are relatively few, and, except for the type specimens of Peck's species which have been examined, I have seen few collections that can be placed here.

Section I. Universal veil clearly manifest.

346. Cortinarius triumphans Fr.

Epicrisis, 1836-38.

Illustrations: Fries, Icones, Pl. 141, Fig. 1.
Gillet, Champignons de France, No. 252.
Cooke, Ill., Pl. 692.
Ricken, Blätterpilze, Pl. 41, Fig. 2.

PILEUS 5-10 cm. broad, convex-plane, obtuse, viscid, spotted with superficial patches of the veil, or glabrous and appressed-subtomentose on drying especially on disk, even, *apricot-yellow to ochraceous-orange* (Ridg.), finally becoming tawny. FLESH soft, white, thick on disk. GILLS at first adnate-subdecurrent then sinuate to emarginate, close, moderately broad, *at first caesius-whitish,* then ochraceous-buff to argillaceous, edge entire. STEM 8-12 cm. long, 1-2 cm. thick above, clavate-bulbous or rounded-bulbous, solid, at first sheathed by a whitish universal veil which is *at length broken into yellowish-ochraceous annular patches terminating above in a ring.* SPORES elliptical, almond-shaped, 12-15 x 6-7.5 micr., tuberculate, rusty-yellow. ODOR and TASTE slightly of coal-tar or radish.

Gregarious to subcaespitose. On the ground in forests of balsam-fir. Adirondack Mountains, North Elba, New York. Collection Kauffman. September, 1914. Rare.

A large, northern species agreeing in all respects with specimens which I collected at Stockholm, Sweden. The collapsed cortina unites with the upper portion of the universal veil to form a band-like annulus. It was reported from New York by Peck in N. Y. State Mus. Bull. 150, 1910. Not yet found in Michigan.

347. Cortinarius maculipes Pk.

N. Y. State Mus. Rep. 54, 1901.

"Pileus 3-6 cm. broad, convex, becoming nearly plane, glabrous, but *covered with a tenacious gluten, bay-red,* becoming paler with age. FLESH whitish. GILLS thin, close, rounded behind, slightly adnexed, *whitish at first,* becoming brownish-cinnamon. STEM 5-7.5 cm. long, 6-12 mm. thick, equal or slightly tapering upward, *subradicating,* solid or stuffed, silky-fibrillose, scaly-spotted, sometimes slightly annulate. SPORES elliptical, scarcely rough, 7.5-9 x 5-6 micr."

The pileus of dried specimens is chestnut-brown and shining. Saccardo gives the spore-measurements much larger, which is clearly an error. Peck says "its prominent characters are the dark-colored pileus smeared with tenacious gluten, the pale young gills and the spotted stem. The spots are formed by the brown fibrils that at first coat the stem, and resemble those of *Armillaria megalopus* Bres." as shown in Fung. Trid., Pl. 47. These scaly spots are clearly the remains of a universal veil. The type specimens are of moderate size.

Section II. Universal veil not manifest.

**Gills at first violet, bluish, purplish or caesious.*

348. Cortinarius sphagnophilus Pk.

N. Y. State Mus. Rep. 29, 1878.

"PILEUS 5-7.5 cm. broad, convex to expanded, glabrous, *viscid, pale brown,* marked *with dark watery spots* especially on the margin. GILLS moderately broad, *subdistant,* transversely rugulose, *at first violaceous* then cinnamon. STEM 10-15 cm. long, silky, striate, *violaceous-white,* then cinnamon, *with an oval bulb at base.* SPORES oblong-elliptical, slightly rough, 10-11.5 (rarely 12.5 micr.) x 5.5-6 micr."

Found in sphagnous marshes, New York. The description is adapted from that of Peck and from his drawings. The pileus is represented as pale smoky brown, the stem almost white and with an oval bulb. "The spotted pileus is a distinctive feature."

349. Cortinarius lanatipes Pk.

N. Y. State Mus. Rep. 42, 1889.

"PILEUS 2.5-7.5 cm. broad, broadly convex or nearly plane, *viscid, grayish,* often tinged with yellow, becoming yellowish or subfulvous and *virgate* with innate tawny fibrils when old. FLESH whitish. Gills adnexed, narrow, close, *pale violaceous at first.* STEM short, 3-5 cm. long, 6-10 mm. thick, *equal or tapering upward above the oval bulb,* solid, subannulate, silky above the annulus, loosely fibrillose-tomentose below, white. CORTINA white. SPORES elliptical, 7.8.5 x 4-5 micr."

In spruce groves, New York. September. The cortina is probably very copious, although it is possible that a white universal veil is also somewhat in evidence. The virgate pileus which changes color in age and the "woolly" covering of the stem are, according to Peck, the distinguishing marks. The type-specimens show that its place is in this group. The plants are not large. This approaches *C. glaucopus* Fr. in some respects.

350. Cortinarius claricolor Fr.

Epicrisis, 1836-38.

Illustrations: Fries, Icones, Pl. 142, Fig. 2.
Gillet, Champignons de France, No. 205.
Cooke, Ill., Pl. 693.
Ricken, Blätterpilze, Pl. 41, Fig. 1.
Quelet, Grevillea, Vol. VI., Pl. 102, Fig. 1.

PILEUS 5-10 cm. broad, firm, obtusely convex, at length broadly convex to plane, subdiscoid, glutinous when moist, shining when dry, even, glabrous, raw-sienna color to *orange-buff* (Ridg.), *unicolorous,* not virgate, margin incurved and cortinate. FLESH compact, *white,* thick on disk. GILLS emarginate-adnexed, *rather narrow,* close, *at first caesious to pale brownish-drab* (Ridg.), finally clay-color, *edge erose-serrate.* STEM 5-8 cm. long, round-bulbous to clavate-bulbous, 12-15 mm. thick above, bulb up to 2 cm. thick, *white,* firm, solid, fibrillose or floccose-fibrillose. SPORES almond-shaped, 8-10 x 5-6 micr., punctate-rough, pale rusty-ochraceous. ODOR and TASTE mild.

Gregarious or subcaespitose. On the ground among spruce and white pine needles. Adirondack Mountains, North Elba, N. Y. September, 1915. Collection Kauffman. Infrequent.

The cracked surface of the pileus and the densely floccose stem, said to be characteristic of the species in Europe, were not characters of the North Elba plants. The stems however, were quite silky-fibrillose with white fibrils. The universal veil is lacking. The spores agree only with the measurements of Britzelmayr. Other authors give larger spores, 10-12 x 7-8 micr., and segregation may become necessary. The bulb may be subemarginate at first, but it is not depressed and the cortina is superior.

351. Cortinarius lapidophilus Pk.

N. Y. State Mus. Rep. 31, 1879.

"PILEUS 5-7.5 cm. broad, at first hemispherical, then convex-expanded, *at first cinereous,* becoming ochre-tinged, often crowded and irregular, *virgate* with appressed fibrils. FLESH whitish. GILLS crowded, *dark-violaceous at first,* then argillaceous-cinnamon. STEM 5-10 cm. long, 6-10 mm. thick, solid, *equal or slightly thick-*

ened at base, whitish." SPORES (of type specimens) broadly elliptic-oval to *subglobose,* rough-punctate, 7-8-x 6 micr.

Subcaespitose. Rocky soil in woods, New York. August.

The pileus of the dried type specimens is dark cinereous. It appears to approach *C. infractus* Fr. in some of its forms and especially as to its spores.

352. Cortinarius copakensis Pk.

N. Y. State Mus. Rep. 31, 1879.

"PILEUS 3-7.5 cm. broad, convex then expanded, often crowded and irregular, *viscid, corrugated, pale ochre* slightly tinged red. GILLS broad behind, subdistant, *violaceous at first,* the interspaces veiny, edge eroded. STEM 5-7 cm. long, rather slender, 4-8 mm. thick, *equal or tapering upwards,* stuffed, silky, whitish." SPORES broadly elliptical to *subglobose,* rough-punctate, 7-9.5 x 7 micr.

"*Subcaespitose.* On the ground in woods. New York. October."

The plants are not large, and the pileus is said to be glabrous and shining when dry. The gills are alutaceous-cinnamon in the dried type-specimens.

353. Cortinarius albidipes Pk.

N. Y. State Mus. Bull. 157, 1912.

Illustrations: Ibid, Pl. 128, Fig. 1-6.

"PILEUS 5-10 cm. broad, compact, hemispheric then broadly convex, obtuse or subumbonate, *viscid,* glabrous and shining when dry, *buff color.* Flesh white. GILLS 4-6 mm. broad, moderately close, *pale violaceous at first,* cinnamon when mature. STEM 5-8 cm. long, 10-15 mm. thick above, *clavate-bulbous and tapering upward,* firm, solid, silky-fibrillose, *white.* SPORES subglobose, 8-10 x 7-9 micr. TASTE mild.

"Among fallen leaves in woods. New York. September.

"A fine, large species, easily recognized by its buff, viscid cap, its violaceous young gills and its white stem thickened or bulbous at the base." As in most of this subgenus, the spores are said to lodge on the remains of the white webby cortina, and form a conspicuous rusty or cinnamon-colored ring near the top of the white stem.

354. Cortinarius decoloratus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 729.
Quelet, in Grevillea, Vol. 7, Pl. 107, Fig. 4.

PILEUS 3-7 cm. broad, convex then expanded, *buff or pallid clay-color,* regular, *viscid,* slightly corrugate when dry. FLESH thin, watery, *soft,* white. GILLS adnate, sometimes subdecurrent, sinuate, close, moderately broad, *caesious or pallid-gray at first* then pale cinnamon. STEM 5-7 cm. long, 3-8 mm. thick, equal or tapering upward, stuffed then hollow, *whitish,* sometimes striate above, obscurely spotted with ochraceous shreds of the veil. SPORES subglobose to oval, almost smooth, 8-9 x 6-7.5 micr.

Gregarious or scattered. In moist places in frondose woods. Ann Arbor. September. Infrequent.

A closely related form has a bitter taste according to some authors. The caesious color of the gills is soon obscure or lacking. It has not been found in quantity and the spores of our plants are slightly too large.

***Gills at first olivaceous or sooty-olivaceous.*

355. Cortinarius infractus Bres. (ex. Pers.)

Fung. Trid., Vol. 2, 1892.

Illustrations: Ibid, Pl. 163.
Cooke, Ill., Pl. 704 (Pl. 705 as *C. anfractus* Fr.).
Quelet, in Grevillea, Vol. 6, Pl. 104, Fig. 3 (as *C. anfractus*).
Ricken, Die Blätterpilze, Plate 43, Fig. 2, et. al.
Plate LXXIII of this Report.

PILEUS 5-10 cm. broad, convex then expanded, *viscid,* glabrous, even, *dark olive or sooty-olive* then tinged fulvous, *margin broadly incurved,* then spreading and often with a broad zone. FLESH whitish or slightly violaceous-tinged, firm, thick except on margin. GILLS narrowed-adnate, sometimes emarginate or spuriously subdecurrent, crowded to almost subdistant, rather narrow, sometimes broader, *dark olive or sooty-olive,* at length umber, edge crenulate-eroded. STEM 5-9 cm. long, 8-15 mm. thick, solid, clavate or with oval bulb, fibrillose, *dull violaceous above,* dingy whitish to olivace-

ous below. SPORES subglobose to oval, rough-punctate, 7-8 x 5-6.5 micr. BASIDIA 30 x 7 micr., 4-spored. ODOR slight. TASTE of pellicle or pileus *bitter*.

Gregarious. On the ground in mixed and frondose woods. August-October. Ann Arbor, Marquette, New Richmond. Infrequent.

This is a variable species, and was placed by Fries under two names: *C. infractus* and *C. anfractus*. Bresadola combined these and gives an excellent description. Ricken (Blätterpilze, p. 144) has again attempted to segregate them. There is no doubt that forms occur which might be kept apart on the basis of different shades of color, stature, etc. Our plants often have narrow adnate gills but luxuriant specimens occur with broad gills. In all forms which seemed to belong here, the pellicle of the pileus was bitter. According to Ricken this would be *C. subsimile* (Pers), but the colors do not agree with that. In all these forms the spores are said to be practically of the same size and shape. Further study on our plant is necessary if they represent different species.

356. Cortinarius olivaceus Pk.

N. Y. State Mus. Rep. 24, 1872.

"PILEUS 3-5 cm. broad, convex then expanded, glabrous, *viscid*, dark brown with a greenish or olivaceous tinge. FLESH *grayish*. GILLS close, rather broad, at length ventricose, *dark olivaceous at first*, then cinnamon. STEM 6-8 cm. long, 6-10 mm. thick, equal, stuffed to hollow, *white-violaceous*, thickened below *with an oval bulb*." SPORES elliptical, very rough, tuberculate, 10-12.5 x 6-7.5 micr.

On the ground, in woods. New York. September. A study of the type-specimens and accompanying drawings show that this species is to be placed in the present subgenus. The spores differ markedly from those of *C. infractus* and *C. herpeticus*, both in size and shape. It approaches *C. luteofuscus* more closely.

357. Cortinarius longipes Pk.

N. Y. State Mus. Rep. 26, 1874.

"PILEUS 5-8 cm. broad, convex to expanded, slightly fibrillose, *viscid, yellowish or pale ochraceous*. GILLS close, plane, *brownish-olivaceous at first*, then cinnamon. STEM *elongated*, 10-15 cm. long, 6-8 mm. thick, *tapering upward*, slightly fibrillose, whitish." SPORES broadly elliptical to subglobose, slightly rough, 6-7.5 x 5-6 micr.

Ground in woods. New York. September.

Related to *C. anfractus* by the spore-characters, but it differs much in the elongated stem and color of pileus. In statue it is more like *C. ophiopus* Pk.

358. Cortinarius glutinosus Pk.

N. Y. State Mus. Rep. 43, 1890.

"PILEUS 2.5-7 cm. broad, convex, *glutinous, brownish-ochraceous*, margin narrowly involute. FLESH yellowish. GILLS adnexed, rather broad, *olivaceous*. STEM 3-7 cm. long, 6-10 mm. thick, solid, whitish or pallid, thickened at the base, *scarcely bulbous*." SPORES broadly elliptical to subglobose, minutely rough, 7-8 x 5.5-6.5 micr.

On mossy ground, Adirondack Mountains, New York. July.

The type-specimens show a rather medium-sized plant; the pileus is dark, dull, rufous-brown when dried, the gills rather broad and not crowded. "The prominent features," says Peck, are "the dull ochraceous pileus, olivaceous gills and pallid stem. The margin of the pileus is sometimes rimose." It seems related to *C. infractus* by its spores and gills, but is apparently distinct because of the change of color of the pileus on drying.

****Gills at first yellow.*

359. Cortinarius luteo-fuscous Pk.

N. Y. State Cab. Rep. 23, 1872.

"PILEUS 5-6 cm. broad, broadly convex, even, glabrous, *viscid, pale fuscous to smoky-brown*. GILLS deeply emarginate, rather broad, rather close, *yellow at first*, at length cinnamon. STEM 9-10 cm. long, 6-8 mm. thick, equal above, *with a rounded-oval bulb* below, solid, silky-striate, *whitish*." SPORES broadly elliptical, obtuse, somewhat rough, 12-13 x 6-7.5 micr.

On the ground in woods. New York. October.

This species is closely related to *C. olivaceus* Pk. both in stature, habit and spore-size. The colors differ somewhat and it needs fur-

ther study. The spores are given too large in the original description. The measurements given above were made from the type specimens.

****Gills at first white or pallid.*

360. Cortinarius coloratus Pk.

N. Y. State Cab. Rep. 23, 1872.

Illustration: Plate LXXIV of this Report.

PILEUS 5-10 cm. broad, convex then broadly campanulate and discoid, *bright reddish-yellow to tawny-orange and shining,* becoming dull testaceous, glabrous, even, sometimes radially cracked on drying, *with a viscid pellicle,* margin at first incurved. FLESH whitish, thick except margin, firm, compact. GILLS adnate at first, becoming emarginate, *rather broad,* close, rigid becoming crisped on drying, thin, *whitish or pallid at first,* then pale clay-color to cinnamon-brown, *not reaching the margin of the pileus,* edge paler. STEM 5-12 cm. long, *clavate-bulbous,* 8-12 mm. thick above, 20-30 mm. thick at bulb, solid, firm, at first white and silky-fibrillose from the cortina, *white within, slightly* lutescent, marked at times by the thin remains of an evanescent, yellowish-tawny universal veil, attached at base to delicate *white* mycelioid strands. CORTINA white, cobwebby, not very copious. SPORES almond-shaped, elliptical, distinctly rough, 9-11 x 6-7 micr. BASIDIA 35-40 x 8-9 micr., 4-spored. ODOR and TASTE slight.

Gregarious. On the ground among fallen leaves in frondose woods of oak, maple, etc. Ann Arbor. September-October. Infrequent.

This is a noble species, well-marked and brightly colored when fresh. It seems closely related to *C. saginus* Fr. and may be the American form of that species. See figures of *C. saginus* (Cooke, Ill., Pl. 703, and Quelet, in Grevillea, Pl. 92), which show a much stockier plant without the reddish color which pervades the pileus of our species. The universal veil is almost obsolete and leaves only one or a few very narrow yellow-tawny marks across the stem. The bulb varies from heavy clavate to rounded-oval, depending on the amount of elongation of the stem. When crushed the flesh sometimes gives forth a slight aromatic-radishy odor. It has been collected in several states.

361. Cortinarius ophiopus Pk.

N. Y. State Mus. Rep. 30, 1878.

"PILEUS 5-10 cm. broad, convex or subcampanulate, then expanded, sometimes irregular, *viscid,* glabrous, *reddish-yellow,* the paler margin sometimes roughened by adhering patches of the whitish veil. FLESH white. GILLS close, rather broad, *brownish-cinnamon,* edge often eroded. STEM 10-15 cm. long, 8-12 mm. thick, equal, *long* and usually much bent or variously curved, at first shaggy-scaly from the subconcentrically arranged fragments of the copious veil, *white or yellowish.* SPORES elliptical, inequilateral, 11-12 x 6-7 micr.

On the ground, among leaves in woods. Maryland. September.

The dried type-specimens have much the appearance of *C. corrugatus* in stature and colors, with a yellowish stem; the spores, however, are smaller, and the bulb seems to be lacking.

362. Cortinarius communis Pk.

N. Y. State Cab. Rep. 23, 1872.

PILEUS 2-6 cm. broad, convex-expanded, obtuse, *whitish with a gray tinge at first,* becoming yellowish or brown in age, *subviscid,* sometimes reddish, *glabrous,* margin decorated at first by white fibrils of the cortina. GILLS emarginate, at length subdecurrent by tooth, medium broad, close, *white to pallid at first,* then pale ochraceous-cinnamon. STEM 4-6 cm. long, 4-6 mm. thick, stuffed to hollow, *equal* or nearly so, curved at base, mealy at apex, subfibrillose, *white* then yellowish-stained. SPORES ventricose-elliptical, 9-10.5 x 5-6 micr. Smooth. TASTE slightly bitterish. CORTINA white.

Gregarious. On grassy ground, in frondose woods. May. Ann Arbor. Infrequent.

The spores and gills are pale brown at maturity, and in this respect depart from the characters of the genus. As Peck has pointed out (N. Y. State Mus. Rep. 30) it is much like Pholiota in these characters. The cortina, however, forms no annulus. The plants appear early with us, while Peck reports it for September-October.

SUBGENUS INOLOMA: Pileus and stem *neither viscid nor hyproghanous.* Pileus at first innately scaly, fibrillose or silky; flesh rather thick. STEM stout, the base enlarged and tapering upward, i. e., clavate-bulbous. Universal veil present or lacking.

This subgenus is composed of species which have the stature of the larger Telamoniae but in that sugbenus the pileus is hygrophanous and subglabrous and when silky or fibrillose the fibrils are superficial. A few species are included here which have a slight hygrophanous character. A few more are added which have a rather equal stem, but show their affinity by the stout habit. One group possesses a universal veil which persists on the stem in the form of an adnate sheath or annulus. In my paper (Bull. Torr. Bot. Club., Vol. 32, p. 305, 1905) this group was eliminated from the diagnosis of this subgenus as there given, but further study has convinced me that a more consistent and natural arrangement would be the recognition of the universal veil under it. The smaller Inolomas gradually approach the subgenus Dermocybe, so that the species of these two groups cannot always be readily distinguished. The stout clavate stem and scaly pileus throw a plant into the Inoloma group, while the small size, the thin flesh of the pileus and the more slender, equal stem indicate a Dermocybe.

Section I. Universal veil manifest on the stem in the form of an appressed sheath.

**Gills at first violaceous, lilac or purplish.*

363. Cortinarius alboviolaceus Fr. (EDIBLE)

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 151, Fig. 3.
Cooke, Ill., Pl. 747 (faded).
Gillet, Champignons de France, No. 191.
Marshall, The Mushroom Book, Pl. 14 op. p. 65, 1905.
Hard, Mushrooms, Fig. 237, p. 295, 1908.
Ricken, Die Blätterpilze, Pl. 44, Fig. 5.

PILEUS 3-6 cm. broad, companulate at first, then convex and broadly umbonate, dry, beautifully appressed silky, *shining,* varying pale violaceous to caesious-buff, *soon silvery-white and scarcely violaceous-tinged,* even, margin persistently decurved. FLESH thin on margin, *caesious or tinged violet,* surface differentiated into a thin layer, up to 15 micr. thick, composed of narrow, horizontal hyphae about 3 micr. in diam. GILLS at first adnate, then emarginate or slightly subdecurrent, close, moderately broad, varying *pale violet to ashy-purplish at first,* soon paler, at length cinnamon-brown, edge eroded-crenulate. STEM 4-8 cm. long, *clavate-thickened at or near the base, narrowed* upwards, 5-9 mm. thick above, up to 20 mm. below, spongy-stuffed, *usually peronate by thin, white, appressed, silky-interwoven, soft universal veil,* violaceous above and beneath the veil. CORTINA white. SPORES 6.5-9 x 4-5 (rarely 10 x 5.5), elliptic-oval to narrow-elliptical, scarcely rough, *variable in size.* BASIDIA 30 x 6-7 micr., 4-spored. ODOR and TASTE mild. MYCELIUM white.

Gregarious. Among leaves or in deep humus of hemlock, mixed or frondose woods. Throughout the State. August-October. Scarcely infrequent.

It is possible that this species may be composed of an aggregation of several forms. One form has more uniform and smaller spores and the surface layer of the pileus becomes subgelatinous in wet weather. I would call this forma *pulchripes,* since the stem is beautifully marked by the violaceous color above the white sheath. Its spores measure 6-7.5 x 4-5 micr. In all other respects it shows the characteristics of *C. alboviolaceus.* All forms have the same development. In the young plant, the stem is relatively stout and clavate-subconic, with a more or less helmet-shaped young cap, scarcely broader than the stem, mounted on its apex. The mature stem is somewhat irregularly ventricose-thickened, sometimes above the base, sometimes truly clavate-bulbous. The color is typically violaceous-white but varies to deeper violaceous in the gills and flesh and the very young button is deeper violet in the interior. The color fades somewhat, but dried specimens always show the gray or violet tints. I have not been able to distinguish *C. malachius* Fr., an European plant, in this region. The nearest relative of *C. malachius* with us seems to be *C. obliquus* Pk.

364. Cortinarius subpulchrifolius sp. nov.

Illustration: Plate LXXV of this Report.

PILEUS 4-10 cm. broad, firm, subhemispherical at first, then broadly convex to expanded, often gibbous, obtuse, *not hygrophanous, innately silky-tomentose,* glabrescent, even, *grayish-buff,* becoming ochraceous or rusty stained in age, margin at first incurved, then spreading and whitened by the veil. FLESH *thick,* compact, pale caesious then whitish. GILLS adnate at first, becoming sinuate-subdecurrent, *broad,* subventricose, *subdistant, at first dull*

purple, color subpersisting, at length cinnamon-umber, thickish, edge entire. STEM stout, 5-10 cm. long (often of medium length), 10-15 mm. thick, equal or slightly enlarged below, *firm,* solid, *sheathed by the distinct, appressed, dingy-white universal veil,* which terminates at or above the middle in an evanescent floccose-fibrillose ring, sometimes only marked by the thin subannular patches of this veil, apex violaceous or pale drab, whitish to drab within. CORTINA white, rather copious. SPORES broadly elliptical, distinctly rough-punctate, maturing slowly, 9-10.5 x 5-6.5 micr., rusty-umber in mass. BASIDIA 36-40 x 9, 4-spored. ODOR slightly of humus. TASTE mild.

Gregarious or subcaespitose. On the ground, among fallen leaves, in frondose and mixed woods. September-October. Ann Arbor, New Richmond. Rather frequent.

This species approaches *C. pulchrifolius* in possessing purple gills which remind one of *Clitocybe ochrapurpurea* except that they are not as bright as in that species. An examination of the type-specimens of *C. pulchrifolius* showed that our plant is distinct. The spores never come within the sizes of Peck's species, and the pileus has no reddish shades. The dried plants are also different. In spite of these things the two species are close together. Except for its lack of the hygrophanous flesh, and the character of the surface of the cap it also approaches *C. impennis* Fr. and *C. torvus nobilis* Pk. The universal veil is usually well-developed, but sometimes the remnants show only as thin patches on the mature stem. The purplish color of the gills is retained to late maturity. The spores mature slowly and the measurements must be made from mature plants. It must not be mistaken for either *C. torvus* Fr. nor *C. impennis* Fr.

365. Cortinarius pholideus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 761.
Quelet, in Grevillea, Vol. VII, Pl. 117, Fig. 1.
Ricken, Die Blätterpilze, Pl. 46, Fig. 4.
Plate LXXVI of this Report.

PILEUS 4-8 cm. broad, hemispherical-campanulate at first, then expanded, broadly umbonate, *surface covered by dense, innate, erect or squarrose, dark, cinnamon-brown or blackish-pointed hairy scales,* fawn-color at first, not hygrophanous. FLESH thin, slightly violaceous, soon whitish or sordid brownish, usually infested with larvae. GILLS narrowly adnexed, medium broad, close, lilaceous at first, soon clay color to brown, edge entire. STEM 4-8 cm. long (sometimes longer), 5-12 mm. thick, spongy-stuffed and tunneled by larvae, slightly narrowed upwards, violaceous or lilac-tinged above the concentric, squarrose, brown scales which represent the sheathing universal veil. CORTINA sparse, fibrillose. SPORES oval, rough-punctate, 6-7.5 x 5-5.5 micr. BASIDIA 27 x 6 micr. ODOR and TASTE mild.

Gregarious or caespitose. In moist forests, near decaying debris or on very rotten logs, in the conifer regions of the State. Bay View, Marquette. August-September. Infrequent.

This well-marked species is probably frequent enough in its particular localities. I have collected it a number of times on much decayed wood in wet places, a preference which authors do not appear to have noticed for it elsewhere. The color varies somewhat as to the shade of brown which the veil and the pileus possess, but the characteristic scales of the cap and stem serve for easy identification. Two European species approach it closely. *C. arenatus* Fr. differs in its entire lack of violaceous hues. This has been reported in the state list, but it is probable that it was confused with a Pholiota. *C. penicillatus* is said to lack the squarrose scales, as well as the violaceous tints of the gills and flesh. *C. asper* Pk. may be only a variety of this species.

366. Cortinarius squamulosus Pk.

N. Y. State Cab. Rep. 23, 1872.

Illustrations: Ibid, Pl. 3, Fig. 1-3.

PILEUS 4-10 cm. broad, semiglobose at first, then convex to subexpanded and broadly umbonate, surface densely appressed-tomentose at first, *soon broken up into dense, rather large, fibrillose scales,* sometimes warty on disk, brown and purplish-tinged at first, *soon chocolate-brown.* FLESH thick on disk, abruptly thin toward margin, watery-spongy, pinkish-white to grayish-white at first. GILLS adnate then deeply emarginate, rather broad, close, *purplish at first, soon dark cinnamon to chocolate-brown,* edge minutely flocculose. STEM 8-15 cm. long, stout, *swollen near the base into a large, ventricose-clavate bulb,* tapering below the bulb, 10-20 mm.

thick at apex, bulb 2 to 3 times as thick, watery-spongy within, at first purplish, *soon chocolate-brown,* sometimes subscaly, sometimes fibrillose, *annulate above by a definite band-like collar.* CORTINA pallid to brownish, closely woven. SPORES 6.5-8.5 x 6-6.5 micr., broadly elliptical to subsphoeroid, distinctly rough, dark rusty-brown in mass. BASIDIA 33 x 6 micr., 4-spored. ODOR somewhat spicy when fresh becoming strong on drying. TASTE at first mild.

Gregarious, sometimes in troops. On the ground, in low, moist, frondose woods or swamps of maple, beech, etc. Detroit, Ann Arbor. August-September. Infrequent.

Easily known by its entirely chocolate color when mature, the ventricose, pointed bulb and the band-like annulus. It absorbs water in rainy weather and becomes watery-spongy, but on drying out it takes on a tough consistency. It can scarcely be confused with any other species. Sterile outgrowths border the edge of the gills so that they appear flocculose.

367. Cortinarius erraticus Pk.

N. Y. State Mus. Rep. 42, 1889.

"PILEUS 5-7.5 cm. broad, firm, subcampanulate or convex, obtuse, dry, silky or obscurely scaly with innate fibrils, *canescent, often becoming grayish-tawny.* FLESH dingy white. GILLS adnexed, subdistant, pale tawny, becoming darker with age. STEM 5-10 cm. long, 6-12 mm. thick, firm, solid, *thickened toward the base,* white and tomentose below, *violaceous above.* UNIVERSAL VEIL *violaceous,* often forming an imperfect annulus and sometimes remaining in fragments or floccose scales on the margin of the pileus." SPORES elliptical, scarcely rough, 7.5-10 x 5-6 micr.

On the ground in groves of balsam. New York. September.

A study of the type-specimens showed that it has a universal veil, and that the spores average larger than the size given by Peck. The color of the gills when young is not certain. It would be a rather unusual relation to find the apex of the stem violaceous while the young gills are "pale tawny." For this reason, I have included it under the present section, where it probably belongs.

***Gills without violaceous or purple tints at the first.* (Likewise pileus, flesh and stem.)

368. Cortinarius bolaris Fr,

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 760.
Gillet, Champignons de France, No. 199.
Quelet, in Grevillea, Vol. V, Pl. 79.
Ricken, Die Blätterpilze, Pl. 46, Fig. 2.
Plate LXXVII of this Report.

PILEUS 3-6 cm. broad, convex-expanded, obsoletely umbonate, *variegated by appressed, pink-red, saffron-red or cinnabar red, hairy scales* on a white ground, dry, fading, the thin incurved margin surpassing the gills. FLESH white, tinged creamy-yellow, thin. GILLS adnate, close, medium broad, distinct, pallid, *soon pale cinnamon.* STEM 5-6 cm. long, 5-10 mm. thick, tapering upward and *subequal,* stuffed then hollow, *covered like the pileus by red, fibrillose-hairy, appressed scales,* sometimes subglabrescent, *flesh becoming saffron or reddish when bruised.* CORTINA white. SPORES broadly oval to subsphoeroid, scarcely rough, 6-7 x 5-5.5 micr. BASIDIA 30 x 6 micr., 4-spored. ODOR and TASTE none. MYCELIUM red.

Gregarious or subcaespitose. In the conifer regions of the State, in mixed woods of hemlock and beech. Bay View, New Richmond. August-September. Infrequent.

This Cortinarius is known by its delicate hairy-fibrillose ornamentations on the cap and stem; these are saffron-red or darker in contrast with the whitish or yellowish flesh beneath. The cap is dry, not hygrophanous, but the fibrillose scales appear as if glued thereon. This must not be confused with *C. rubripes* which is markedly different, usually very glabrous on the pileus and much larger. The figures referred to above illustrate our plant well, except that of Ricken which emphasizes the scales and shows a stem tapering downwards. The decoration on the stem apparently represents the remnants of a universal veil.

369. Cortinarius annulatus Pk.

N. Y. State Mus. Rep. 43, 1890.

Illustrations: Ibid, Pl. 2, Figs. 1-4.
Plate LXXVIII of this Report.

PILEUS 3-9 cm. broad, broadly convex at first, then subexpanded, obtuse, dry, disk or entire surface usually *covered with innumerable, minute, pointed, erect floccose and tawny scales,* sometimes smooth, ground color, golden-tawny or tawny yellow, with a bronze lustre, margin at first incurved. FLESH thick, whitish, scarcely or not at all hygrophanous. GILLS adnate, becoming emarginate, *rather narrow,* 4-9 mm. subdistant, distinct, *at first pallid ochraceous,* then rusty-cinnamon, rather rigid, edge paler. STEM 4-8 cm. long, apex 8-15 mm. thick, *clavate,* twice as thick below, sometimes subequal, *peronate three-fourths to apex by the thin, silky-woven,* appressed, *pale tawny or yellowish universal veil,* which terminates above in an obscure ring, solid, yellowish within, whitish and fibrillose above the veil from the *white* CORTINA, base whitish, arising from a *white mycelium.* SPORES *globose,* distinctly rough, 6-7 x 5-6 micr., dark rusty-brown in microscope. ODOR of radish. TASTE mild or slightly astringent.

Gregarious, or scattered, sometimes in troops. On the ground in frondose or mixed, rich woods. August-October, usually rather early. Ann Arbor, Detroit. Not infrequent.

This species seems to represent the American form of *C. tophaceus* Fr., but the figures of that species as given by Fries, Cooke and Quelet do not remind one at all of our species. It is not easy to bring out in a figure the metallic, somewhat glittering, luster shown by a typical pileus of this plant. Ricken's figure of *C. tophaceus* comes nearer to the exact color, but he describes that species with the edge of the gills bright yellow. *C. annulatus* differs from *C. flavifolius* in the color of the universal veil and the scaly pileus. Specimens have been seen, however, in which the color of the pileus varied to ochraceous or clay-color, with brown scales. The scales, when well-developed, radiate in a star-like or bird-foot manner connecting with one another and raised in the center to a needle-like point. In the very young plant the surface of the cap is merely densely and finely tomentose, this layer connecting with the veil on the stem. Sometimes the scales are almost entirely lacking except on the center of the disk. *C. lutescens* Pk. seems to represent the latter condition. (N. Y. State Mus. Rep. 42, 1889.)

370. Cortinarius flavifolius Pk.

N. Y. State Mus. Rep. 41, 1888.

Illustrations: Atkinson, Mushrooms, Plates 45 and 46, Figs. 152 and 153, 1900 (as *Cortinarius ochroleucus*).
Plates LXXIX, LXXX of this Report.

PILEUS 4-15 cm. broad, (usually 4-8 cm.), convex then expanded, almost plane, *creamy-buff at first,* sordid, buff to ochraceous, or pale tawny-yellowish in age, *appressed tomentose or minutely fibrillose-scaly,* sometimes only silky-tomentulose, margin at first incurved. FLESH thick, abruptly thin toward the margin, whitish, scarcely hygrophanous but moist. GILLS adnate then emarginate, *subdistant,* broad, *dull pale yellowish at first,* then *ochre-yellow,* finally yellowish-cinnamon or rusty. STEM 4-12 cm. long, *clavate or clavate-bulbous,* 6-18 mm. thick above, 15-30 mm. below, sometimes subequal, spongy-solid, *covered at first by a thin, silky-woven, appressed whitish universal veil, at length peronate* or becoming naked. CORTINA white, silky, copious, sometimes forming a rusty-stained ring above the veil. SPORES sphoeroid to oval-elliptical, minutely but distinctly rough, with an abrupt, long apiculus (as in species of Russula), 6-9 x 5-6 (incl. apiculus). BASIDIA 36-40 x 6-7 micr., 4-spored.

Gregarious. On the ground in rich humus or among fallen leaves, in frondose woods of oak, maple, etc. Throughout the State. August-October. Frequent.

A well-marked plant, often of large size and distinguished by the white universal veil which forms a very thin sheath on the stem, by the prevailing silky-tomentulose pileus and rather broad gills. It was referred by Peck to the subgenus Telamonia, but the flesh is scarcely hygrophanous, and the pileus not glabrescent. The gills are rarely "rich sulphur-yellow" as described by Peck, but the spores of the type-specimens are described above and are quite distinct. It differs from *C. annulatus* and *C. croceocolor* in the pale, delicate yellowish-white colors of cap and stem. It is apparently a native American species. *C. newfieldiensis* Ellis of the N. A. F. exsiccati No. 3052 is identical.

371. Cortinarius croceocolor Kauff.

Bull. Torr. Bot. Club, Vol. 32, 1905.

Illustrations: Ibid, Fig. 5, p. 314.
Jour. of Mycology, Vol. 13, Pl. 93, 1907.
Mycological Bull., Vol. 5, Fig. 240, p. 314, 1907.
Plate LXXXI of this Report.

PILEUS 3-7 cm. broad, convex then expanded, *saffron-yellow, with dense, minute, dark-brown, erect squamules on disk,* scarcely hygrophanous, not striate. FLESH yellowish-white, thick on disk, thin toward margin, slightly hygrophanous, scissile. GILLS cadmium-yellow, scarcely subdistant, rather thick, emarginate, rather broad, width uniform. STEM 4-8 cm. long, clavate or clavate-bulbous, 9-15 mm. thick below, *peronate three-fourths of its length by the chrome-yellow to saffron-yellow universal veil,* paler at apex, solid, saffron-colored within, soon dingy, attached to strands of yellowish mycelium. SPORES subsphoeroid to short-elliptical, 6.5-8 x 5.5-6.5 micr., echinulate.

Gregarious or solitary in mixed woods, Ithaca, N. Y. Not yet found within the borders of the State. Probably to be looked for in the north. The whole surface of the pileus has a velvety appearance and feel. The entire plant is often saffron-colored. It approaches *C. callisteus* Fr. on the one side and *C. limoneus* Fr. on the other. It was originally placed under the subgenus Telamonia, but the present characterization of Inoloma admits it here. *C. croceofolius* Pk. seems to be somewhat related, but averages much smaller and its pileus is more brown and lacks the scales, and the stem is not peronate.

372. Cortinarius ochraceous Pk.

N. Y. State Cab. Report 23, 1872.

PILEUS 5-8 cm. broad, convex, *broadly subumbonate* or gibbous, glabrous, *pale ochraceous,* even or obscurely wrinkled. FLESH thick, whitish. GILLS emarginate, rather broad, subdistant, *pallid to pale ochraceous at first,* then rusty-cinnamon. STEM 5-10 cm. long, rather stout, 8-12 mm. thick at apex, *clavate or clavate-bulbous,* bulb 20-38 mm. thick, fibrillose, ochraceous above *the white, appressed, sheath of the universal veil.* SPORES broadly elliptical, slightly rough, obtuse at ends, 9-11.5 x 6-7.5 micr.

Under balsam trees. New York. October.

The original description has been completed by a study of the type specimens and of the drawings made by Dr. Peck. The sheath on the stem is white and much as in *C. flavifolius,* but the spores are much larger.

373. Cortinarius canescens Pk.

N. Y. State Rep. 42, 1889.

"PILEUS 5-7.5 cm. broad, subcampanulate or convex, obtuse or somewhat umbonate, *silky or scaly with innate grayish fibrils, whitish gray when young,* tinged with yellow or rufous hues when old. GILLS thin, subdistant, rounded behind and adnexed, *pallid at first.* STEM 5-10 cm. long, 8-12 mm. thick, solid, *white,* equal or tapering upward from a large, soft, spongy, *clavate-thickened base, peronate and subannulate by the silky-fibrillose, white veil.*" SPORES elliptical, subinequilateral, slightly rough, 10-12 x 5.5-6.5 micr. ODOR not marked. TASTE unpleasant."

Gregarious. In spruce groves. New York. September.

Peck states that it is distinct from its allies by the absence of violaceous hues in the young gills. The pileus of the dried type specimens is of a dark smoky-gray color.

374. Cortinarius squarrosus Clements

Botanical Survey of Neb., 1901.

"PILEUS 2.5-3 cm. broad, campanulate then convex, dry, subumbonate, *clothed on disk by dense, squarrose, umber scales,* fasciculate-fibrillose on the margin, pallid umber. GILLS slightly adnate, ventricose, sometimes uncinate, *fulvous to umber.* STEM 3-4 cm. long, 5 mm. thick, subequal, hollow, fibrous-fleshy, clothed with fulvous-umber, subsquarrose fibrils. CORTINA fibrillose, umber, fugacious. SPORES irregularly elliptical, smooth, 12 x 6 micr.

"Among vegetation on the ground in woods. Nebraska."

This species approaches *C. pholideus* and *C. squammulosus,* but the spores are larger and the gills are not described with any purplish tint when young. It is a rather small Inoloma.

Section II. Universal veil lacking or obsolete.

**Gills at first violaceous, purple, lilac or caesious.*

375. Cortinarius violaceus Fr. (Edible)

Syst. Myc., 1821.

Illustrations: Gillet, Champignons de France, No. 257.
Fries, Sveriges ätlig. o. gift, Pl. 58.
Peck, N. Y. State Mus. Rep. 48, Pl. 12, 1894.
Cooke, Ill., Pl. 770 (deceptive).
Patouillard, Tab. Analyt., No. 127. (Immature.)
White, Conn. State Geol. and Nat. Hist. Surv., Bull. 15, Pl. 23.
Ricken, Die Blätterpilze, Pl. 44, Fig. 4.

PILEUS 5-12 cm. broad, convex, obtuse, subexpanded, *dry, dark violet, covered with villose, minute suberect tufts or scales,* at length metallic-shining. FLESH rather thick, varying gray to dark violet, not becoming purple when bruised. GILLS adnate, becoming sinuate or emarginate, thick, *broad, subdistant, very dark violet,* becoming ashy-cinnamon. STEM 7-12 cm. long, *long and stout,* clavate or clavate-bulbous, 10-15 mm. thick above, *dark violet,* fibrillose, spongy in the rounded bulb, violaceous within, bulb large. SPORES *large,* rough, broadly elliptical, 12-16 x 7-9 micr. (often 16-18 micr. long, then smoother and more elongated). ODOR and TASTE mild.

Solitary or scattered. Among mosses, fallen leaves and debris of conifer woods. Found only once in Michigan; Isle Royale, Lake Superior. Frequent at North Elba, Adirondack Mountains, New York. August-October.

A striking species, not to be confused with dry specimens of the viscid-capped species, such as *C. purpurascens, C. sphaerosperma,* etc. The stem is usually long as compared with these, and the cap correspondingly smaller. The peculiar metallic luster of the dry mature pileus was observed in both our native collection and in Sweden. Both also had the characteristic fine-hairy-scaly surface not easily shown in figures but approached by Fries. No photographs exist which show this character well. The abnormally large spores were present in both our own and the Swedish plants. The whole plant is at first dark deep violet with an indigo tinge. Although nearly always mentioned in the "lists" of various American writers, its local or northern distribution leads me to suspect that other species have been mistaken for it. It seems to be more frequent in the east.

376. Cortinarius lilacinus Pk. (Edible)

N. Y. State Mus. Rep. 26, 1874.

Illustration: Plate LXXXII of this Report.

PILEUS 5-9 cm. broad, firm, hemispherical, then convex, *minutely silky* or glabrous, *lilac-colored,* margin at first incurved. FLESH very thick on disk, compact and firm, tinged with lilac. GILLS adnexed, rounded behind, rather broad, thick, close to subdistant, sometimes transversely rivulose, *lilac at first,* then cinnamon, edge entire. STEM *stout,* 6-12 cm. long, *with a very large clavate bulb,* 15-20 mm. thick above, bulb 2-4 cm. thick, solid, compact, bulb spongy, fibrillose, lilaceous. SPORES broadly elliptical, rather obtuse, scarcely rough, 8-10 x 4.5-6.5 micr.

Gregarious. In low, moist swampy places in mixed or frondose woods. Detroit, Marquette. August-September. Infrequent.

The lilac color persists in the dried specimens. The bulb is much broader in the young plant than the unexpanded pileus. It is quite distinct from *C. alboviolaceus* in habit and stature, as well as color. The color of the pileus is like that of the European *C. traganus* Fr., and so is the general shape of the plant, but that species is quite distinct by a strong odor and by its ochre-yellow gills at the first. More slender plants have been found which apparently belong here and these are not easily distinguished from the related species such as *C. argentatus, C. obliquus,* etc., except by the color.

377. Cortinarius argentatus Fr. var.

Syst. Myc., 1821.

Illustrations: (Fries, Icones, Pl. 152, Fig. 2 of *C. camphoratus.*)
Cooke, Ill., Pl. 745 (771 of *C. camphoratus*).
Gillet, Champignons de France, No. 194.

PILEUS 5-9 cm. broad, convex to almost plane, *silvery-violaceous-whitish,* sometimes with a lilac or amethystine tinge, *dry,* beauti-

fully appressed silky, even, not umbonate. FLESH whitish or at first tinged violaceous, thick on disk, abruptly thin on margin. GILLS narrowly sinuate-adnate, narrow, *close, pale violaceous,* rarely deep violaceous at first, soon pale alutaceous-cinnamon, edge minutely eroded-crenulate. STEM 5-8 cm. long, 10-20 mm. thick, solid, subequal *above the oval-bulbous or rounded-bulbous base,* bulb sometimes subemarginate, not depressed, sometimes subobsolete, *soon silvery-violaceous-whitish,* at first somewhat deeper violet at apex, concolor within, at first subfibrillose from the *violaceous-white* CORTINA, then innately silky, not at all peronate. SPORES elliptical, slightly rough, 7-9.5 x 5-6 micr. BASIDIA 30 x 9 micr., 4-spored. ODOR mild. TASTE slight.

Solitary or scattered. On the ground in woods of white pine and beach or in low frondose woods. Detroit, New Richmond. September. Infrequent.

This seems to be intermediate between *C. argentatus* and *C. camphoratus,* and differs from both in the more abrupt bulb than is shown by the figures of those plants. On the other hand, variations occur in the same collections in which the clavate-bulbous condition is present. On several occasions single plants were found, which agreed with the others except that there was present a distinct, penetrating odor, of an earthy-radishy nature. I have here considered them all the same. The narrow gills are always close, sometimes crowded, and this distinguishes it from the preceding. The surface of the pileus is scarcely or not at all differentiated into a pellicle or other layer although a very slight viscidity develops if the plant is kept enclosed for a time in a tight receptacle. In habit, size and paler gills it differs markedly from *C. obliquus.* There is no universal veil.

378. Cortinarius obliquus Pk.

N. Y. State Mus. Bull. 54, 1902.

Illustrations: Ibid, Pl. L, Figs. 1-5.

PILEUS 3-6 cm. broad, broadly convex, subexpanded, dry, silky-fibrillose, *violaceous-white or grayish-white,* margin at first incurved. FLESH thickish on disk, concolor. GILLS adnate, thickish, *narrow, heliotrope-purple to deep lavender at first,* at length cinnamon-brown, close, obscurely transversely rivulose, edge minutely crenulate. STEM 3-6 cm. long, short and rather stout, 6-12 mm.

thick above, solid, silky-fibrillose, *whitish,* violet-tinged within and without, *equal above the abrupt, depressed-marginate, oblique bulb.* SPORES narrowly elliptical, slightly rough, 7-9.5 x 4.5-5.5 micr., rather variable. ODOR and TASTE mild.

Gregarious. On the ground in frondose or mixed woods. August-September. Detroit, New Richmond, Marquette. Infrequent.

Well marked by the white or grayish-white pileus, the deep violet or almost amethystine or heliotrope color of the young gills and the oblique, flattened bulb of the stem. It has a dry pileus, without a viscid pellicle and must not be confused with the species of the subgenus Bulbopodium. When young, the color of the gills is in sharp contrast with that of the cap and stem. *C. brevipes* Pk. (41 st. Rep. N. Y. State Mus.) cannot be placed without further study.

379. Cortinarius pulchrifolius Pk.

N. Y. State Mus. Rep. 33, 1880.

"PILEUS 5-10 cm. broad, convex or expanded, obtuse, silky-fibrillose, *whitish or reddish-gray,* the margin whitened by the veil. GILLS emarginate, *broad, subdistant, bright purple or violet-purple,* then umber. STEM 5-10 cm. long, 6-10 mm. thick, solid, *cylindrical above the clavate or oval bulb,* silky-fibrillose, white, often tinged violet, violaceous within. CORTINA copious. SPORES elliptical, rough, 10-12.5 x 6.5-7.5 micr."

Oak woods. September. New York. Rare.

"This rare species is well-marked by the peculiar color of the young gills, which resembles that of the gills of *Clitocybe ochropurpurea.*" A study of the type showed the spores to be markedly larger than in my *C. subpulchrifolius,* and without the peronate stem. I have not collected it.

380. Cortinarius rimosus Pk.

N. Y. State Mus. Rep. 48, 1896.

"PILEUS 5-10 cm. broad, firm, convex or plane, glabrous, *at first pale grayish-violaceous,* then tinged reddish-brown, the surface cracking into appressed scales or *becoming variously rimose.* FLESH whitish. GILLS emarginate, *rather broad, distant,* subventricose, *violaceous at first,* becoming brownish-ochraceous. STEM

4-8 cm. long, 8-12 mm. thick, *equal to slightly* enlarged at base, white and silky with the white veil, tinged violaceous within." SPORES elliptical, rough, obtuse at ends, 9-12 x 5.5-6.5 micr.

"Grassy ground in open places, thin woods. New York. September. A rather large and stout plant, remarkable for the tendency of the epidermis to crack in areas. The thin margin is often split." Peck considered it to be near *C. caninus* Fr. and *C. azureus* Fr., but its stout habit seems to bring it closer to this group. It must be remembered that other species often have a rimose pileus under certain weather conditions.

381. Cortinarius braendlei Pk.

Bull. Torr. Bot. Club, Vol. 32, 1905.

"PILEUS 7-12 cm. broad, firm, convex, silky, *brownish-lilac,* often varied by yellowish-brown stains, margin at first incurved and covered by the grayish-white silky cortina. FLESH lilac, especially in the young plant. GILLS adnate, slightly rounded behind, narrow, close, eroded on the edge, *grayish tinged with lilac.* STEM 5-7 cm. long, 10-15 mm. thick, stout, solid, silky-fibrillose, *bulbous,* white or whitish, bulb often pointed below. SPORES oblong-elliptic, obscurely granular, 12-15 x 7-8 micr. ODOR of radish.

"Among fallen leaves in woods. Washington, D. C. October. Sometimes the pileus loses all its lilac color and becomes wholly yellowish-brown."

383. Cortinarius rubrocinereus Pk.

N. Y. State Mus. Rep. 33, 1880.

"PILEUS 5-7 cm. broad, convex then expanded, silky-fibrillose, *reddish-cinereous.* FLESH at first violaceous. GILLS emarginate, rounded behind, subdistant, *dingy violaceous* at first, soon pale cinnamon. STEM 4-5 cm. long, 8-12 mm. thick, *short,* solid, *oval-bulbous,* silky-fibrillose, whitish tinged with violet." SPORES 8.5-11.5 (a few up to 14) x 6-7.5 micr., variable in size, broadly elliptical, obtuse at ends.

"Gregarious. On sandy soil. New York. September. Closely related to *C. pulchrifolius,* from which it is separated by its darker colored pileus and differently colored gills. CORTINA whitish-cinereous."

383. Cortinarius clintonianus Pk.

N. Y. State Mus. Rep. 26, 1874.

"PILEUS 2-5 cm. broad, convex to expanded, with a few appressed silky fibrils (*pale dingy brownish-tan*), more or less tinged with gray. GILLS close, moderately broad, *dull-violaceous at first,* then cinnamon. STEM 5-7 cm. long, *rather slender,* 4-6 mm. thick, tapering upward from a subclavate base, *violaceous above,* silky fibrillose. SPORES broadly elliptical to *subglobose,* rough-punctate, 7-8 x 6-7 micr."

Ground in woods. New York State. September-October. A revised description is given above, from the study of the type-specimens and the accompanying colored figures. The cap is said to be "reddish-brown," but if so, the colors of the drawing are very pale.

***Gills at first yellow, clay-yellow, or pale cinnamon.* (Becoming rusty-cinnamon or watery-cinnamon in age.)

384. Cortinarius callisteus Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 153, Fig. 2.
Cooke, Ill., Pl. 774 and 864.

PILEUS 4-8 cm. broad, convex to subcampanulate, subumbonate, moist but not hygrophanous, *deep chrome-yellow to ochraceous-fulvous,* not fading, innately silky, glabrescent, margin at first incurved and silky. FLESH thick, thin on margin, whitish or tinged yellowish. GILLS adnate, subdistant, moderately broad, *yellow at first* then argillaceous to rusty-cinnamon, edge entire. STEM 4-9 cm. long, *clavate-bulbous,* 8-10 mm. thick above, 2 to 3 times as thick below, tapering upward, firm, solid, *yellow* (luteus) within and without, *streaked longtitudinally with fulvous innate fibrils.* CORTINA fugacious, sometimes adhering at first to the margin of the pileus, yellowish-white. SPORES elliptical-oval, 7-8.5 x 5-5.5 micr., rough. ODOR weak, subnitrous.

Gregarious. On the ground in mixed hemlock, pine and oak woods. Ithaca, New York. September. Rare.

This species differs from the yellow-gilled group of the preceding section in the obsolete or absent sheath on the stem. Ricken has described and figured a species under this name with a minutely squarrose-scaly pileus and a differently shaped stem. Our plant seems to fit the Friesian species more closely than his, and the spores agree with those of specimens from Stockholm. Its colors and shapely form make it an attractive species. It does not appear to occur often. The colors become deeper in age.

385. Cortinarius autumnalis Pk.

N. Y. State Cab. Rep. 23, 1872.

Illustration: Hard, Mushrooms, Fig. 236, p. 294, 1908.

"PILEUS 5-9 cm. broad, convex to expanded, *dull rusty-yellow,* variegated or streaked with innate ferruginous fibrils. GILLS moderately broad, close, with a wide, shallow emargination, *at length rusty-yellow.* STEM 6-10 cm. long, 10-12 mm. thick, *equal above the oval bulb,* pale rusty-yellow, solid, firm. FLESH white." SPORES elliptical, slightly rough, 7.5-9 x 4-5 micr.

"Pine woods. Bethlehem, Pennsylvania. November."

This is a somewhat confusing species. Including the type, I have seen specimens from several sources so named, but have not been able to refer any of my collections to it. The description as given by Peck is incomplete and although I have amended it so far as the type-specimens and an accompanying drawing permits, it remains uncertain as to the color of the young gills. The specimens of Peck show that it changes markedly towards rusty colors in age. The photograph of Hard represents a plant which appears familiar but as he omits a description of his own no certainty can be felt about it.

386. Cortinarius catskillensis Pk.

N. Y. State Cab. Rep. 23, 1872.

"PILEUS 5-8 cm. broad, convex or subcampanulate, then subexpanded, even, *grayish-drab,* (pale ferruginous?) variegated with minute, scattered white fibrils. GILLS deeply emarginate, close to subdistant, rather broad, *watery cinnamon at first,* becoming darker with age. STEM 6-9 cm. long, 10-20 mm. thick, *stout,* solid, fibrillose, whitish, *clavate-bulbous,* tapering upward." SPORES narrowly elliptical, somewhat pointed at one end, 7-8 x 4-4.5 micr.

On the ground in open places. Catskill Mountains, New York. October.

The colored drawing accompanying the type-specimens shows a stout, clavate-bulbous plant with a grayish-drab pileus. Dr. Peck told me the pileus never had any reddish hues and the original description of a "pale ferruginous" pileus also is not borne out by the appearance of the dried specimens. A plant, apparently intermediate between this and the preceding occurs in Michigan. *Cortinarius robustus* Pk. belongs under this division but like that of the preceding two species, the description is insufficient.

387. Cortinarius whitei Pk.

Bull. Torr. Bot. Club, Vol. 29, p. 560, 1902.

"PILEUS 6-12 cm. broad, hemispherical at first, then nearly plane, with a lobed, wavy or irregular margin, dry, glabrous, *subpruinose, reddish or brownish-orange,* verging to tawny. GILLS deeply and broadly emarginate, subdistant, reddish-brown (?) at first, then brownish-cinnamon. STEM 7-12 cm. long, 15-20 mm. thick, *long, equal,* solid, fibrous, colored like the pileus, adorned with darker, fibrous lines or striations. SPORES subglobose, 7-8 x 7 micr.

"Woods. Mt. Desert Island, Maine. August.

"A large species, intermediate between Dermocybe and Telamonia, related to the former by its dry pileus, to the latter by its general aspect and stout, solid stem." It is placed here for want of necessary additional data on its development. Specimens at the New York Botanical Garden have every appearance of belonging to Telamonia.

******Gills at first white or whitish.***

388. Cortinarius cæspitosus Pk.

N. Y. State Mus. Rep. 42, 1889.

"PILEUS 5-10 cm. broad, firm, convex, often irregular from its crowded mode of growth, *pale yellow or buff,* a little darker on disk,

margin silky-fibrillose. FLESH *white.* GILLS adnexed, rounded behind, thin, close, rather broad, whitish at first, then subochraceous. STEM 3-7 cm. long, 8-12 mm. thick, subequal above, *with a clavate-bulbous base,* silky-fibrillose, floccose-villose at apex, subannulate, *white.*" SPORES narrowly elliptical, *pale,* smooth, 8-9.5 x 4-4.5 micr.

"Mossy ground in open places. Catskill Mountains, New York. The *caespitose* mode of growth, yellowish pileus, pale gills and white flesh distinguish the species."

389. Cortinarius modestus Pk.

N. Y. State Mus. Rep. 26, 1874.

"PILEUS 2-4 cm. broad, convex to expanded, subfibrillose, even or slightly rugulose-wrinkled, *alutaceous.* FLESH white. GILLS close adnexed, moderately broad, nearly plane, *pallid at first,* then cinnamon. STEM 5 cm. long, 4 mm. thick above, clavate-bulbous, subfibrillose, hollow or stuffed with white pith, concolor." SPORES broadly elliptical, 7-8.5 x 5-6 micr.

"Ground in woods, New York. September. Distinguished from *C. clintonianus* by its paler color, more bulbous stem and entire absence of the violaceous tinge of the gills." An examination of specimens on the sheets with the type, showed that several of the larger specimens had different spores and could not belong there. It is sometimes caespitose. In size it approaches the Dermocybes, and appears to be close to *C. albidifolius* Pk. In a letter, preserved at the New York Botanical Garden, Peck states that it is near *C. intrusus* but has different spores.

390. Cortinarius gracilis Pk.

N. Y. State Mus. Bull. 2, 1887.

PILEUS 1.5-4 cm. broad (occasionally up to 7 cm.), *conical at first* and Roods brown (Ridg.) then campanulate and margin decurved, *with a prominent subacute umbo,* pinkish-cinnamon to *light vinaceous-cinnamon* (Ridg.) when drying, subhygrophanous, even, glabrescent, margin at first incurved and white-cortinate, elsewhere *silky-shining* with innate white fibrils. FLESH very thin except on center, concolor. GILLS adnate then emarginate, moderately broad, close, pallid at first, *soon cinnamon* to cinnamon-brown (Ridg.), edge at length crenulate-eroded. STEM 5-15 cm. long, *elongated,* thickness variable, usually 4-8 mm. thick (rarely up to 15 mm.), *cylindrical,* sometimes tapering upward, at length flexuous, *solid,* white fibrillose-silky, *soon pallid* or tinged fuscous, concolor within, glabrescent. CORTINA white, persistent, rarely forming an evanescent ring. SPORES elliptical, 10-11.5 x 6 micr., smooth, pale ochraceous under the microscope. ODOR and TASTE mild.

Solitary, scattered, rarely subcaespitose, deeply imbedded at base of stem *in sphagnum and mosses* in balsam and tamarack swamps. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Frequent.

Variable in size of cap and thickness of stem but very distinct from all other Cortinarii. The pale colors, the conic-campanulate cap, the sphagnum habitat and the spores distinguish it. The type specimens in Peck's herbarium appear to have been specimens of small size. Only the young rapidly developing plants show the hygrophanous character well; they soon fade. Although the species is quite frequent in the swamps, I never saw a well-developed annulus nor definite signs of a universal veil, so that it appears to be intermediate between Telemonia and Inoloma. Occasionally the stem is subclavate below. The gills are not dark at first in good specimens and Peck may have had young, dry weather forms in which the gills sometimes become dark prematurely. It would be remarkable to find the young gills "ferruginous-brown" as described by Peck, in plants colored like this one.

SUBGENUS DERMOCYBE: Pileus and stem *neither viscid nor hygrophanous.* Pileus innately silky at first, glabrescent, flesh thin. STEM *equal* or *attenuated toward apex,* stuffed to hollow, at length slender, rather rigid or exterior. Universal veil rarely present.

Composed of medium-sized or small, rather slender-stemmed and often elegantly colored plants. The cortina is fibrillose, usually of the same color as the pileus. Fries says "easily distinct from the Inolomas by the thinness and substance of the pileus and by the stem." Several species, however, approach the subgenus Inoloma closely, especially those Dermocybes included under my first section. The stem of the species of Dermocybe is at length equal or attenuated and this character combined with the small size and the lack of distinct scales on the pileus, separates them from the subgenus Inoloma. The absence of a truly hygrophanous pileus distinguishes them from the subgenus Hydrocybe, which they simulate in size. Some of the species are quite variable and many intermediate forms

occur, some of which have been given names, especially the forms near *C. cinnamomeus.*

Section I. Universal veil more or less manifest, evanescent.

**Gills at first violaceous or purplish.*

391. Cortinarius caninus Fr.

Syst. Myc., 1821.

Illustrations: Ricken, Die Blätterpilze, Pl. 46, Fig. 5.
Marshall, The Mushroom Book, Pl. 31, op. p. 85, 1905.

"PILEUS 6-10 cm. broad *violaceous-fulvous, soon beautifully rusty-fulvous* to almost orange-fulvous, *micaceous-glistening,* often almost zoned on margin by the remains of the veil, sometimes scaly-cracked, campanulate-convex, obtuse, thin, compact on disk. FLESH pallid, tinged lilac. GILLS *lilac-clay color at first,* soon watery-cinnamon, at length cinnamon-fulvous, emarginate, *broad, subdistant.* STEM 7-10 cm. long, 10-20 mm. thick, *pallid,* at length rusty-fibrillose, narrowed upwards, elastic, stuffed then hollow, at first almost girdled by a pallid veil. SPORES globose, 8-9 x 7-8 micr. BASIDIA 30 x 9-10 micr. ODOR and TASTE mild."

The description is adapted from Ricken. It has been reported several times from this country but I have never recognized it. Except in size it seems to approach some of the forms of *C. anomalus* closely. Saccardo and Stevenson give slightly longer spores. Miss Marshall's plant had a disagreeable odor.

392. Cortinarius anomalus Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 154, Fig. 2.
Cooke, Ill., Pl. 776. (Pl. 850 as *C. lepidopus* Cke.)
Gillet, Champignons de France, No. 192 (as var. *proteus*).
Ricken, Die Blätterpilze, Pl. 47, Fig. 1.

PILEUS 2-5 cm. broad, hemispherical-convex then sub-expanded, obtuse, even, *covered when young* by an interwoven appressed *gray silkiness, becoming pale fulvous-alutaceous when expanded,* sometimes tinged at first with a violaceous-grayish tinge, at length glistening with a micaceous sheen. FLESH thin, dark grayish-violet at first, *soon pallid,* not truly hygrophanous. GILLS adnate at first becoming sinuate-emarginate, *not broad,* close, *at first caesious, violet or grayish-purplish,* then alutaceous-brown, edge lacerate-crenulate. STEM at first clavate and 10-18 mm. thick, then elongated and slender, 5-10 mm. thick, 4-9 cm. long, *spongy-stuffed, at first violet,* soon dingy pallid, or only the apex violaceous-tinged, gray-violet within, when fresh dotted with dingy ochraceous to yellowish scales, *glabrescent* or fibrillose, soon infested with larvae, elastic on drying. SPORES almost spherical, rough-punctate, 7-9 x 67 micr. BASIDIA 34 x 7 micr., 4-spored. ODOR and TASTE mild.

Gregarious. On moist debris and humus, mosses, etc., in beech and hemlock woods. New Richmond. September. Infrequently found, probably not uncommon in the north.

This agrees exactly with the species around Stockholm, where I first saw it. It is sometimes variable especially as to shades of color and the presence or absence of the dingy yellowish remnants of an evanescent universal veil. When mature these little patches on the stem are scarcely visible. In the fully developed condition the violaceous colors have almost or entirely disappeared from the gills and stem. The flesh is moist or shot through with watery streaks when fresh but it is not truly hygrophanous. *C. deceptivus* Kauff. is very close, but is truly hygrophanous and the color is at first deeper. *C. lepidopus* Cke. is apparently also one of its forms. *Cortinarius simulans* Pk. (N. Y. State Mus. Bull. 2, 1887) is another closely allied species and perhaps identical.

393. Cortinarius spilomeus Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 154, Fig. 3.
Ricken, Die Blätterpilze, Pl. 47, Fig. 2.

"PILEUS 2-5 cm. broad, convex to expanded, *fuscescent, rufescent or argillaceous,* gibbous, dry, glabrescent, fading. FLESH rather thin. GILLS emarginate or adnate, crowded, thin, narrow, *caesious or violaceous at first,* at length watery cinnamon, edge very entire. STEM 4-9 cm. long, 6-12 mm. thick, subequal, stuffed to hollow, whitish, tinged lilac or violaceous at first, *variegated by reddish or fulvous, delicately appressed subconcentric scales.*

"Very elegant. The stem is colored similarly to that of *C. bolaris,*

but subequal and the cortina is white." In *C. bolaris* no violet is present in the young plant. The flesh of the cap is thin.

The above is adapted from the descriptions of Fries, especially from that in the Icones, where elegant figures are to be found. Peck has reported it from New York and it is desirable to get data of its distribution in America. It seems to be very rare. The size of the spores is not agreed upon by European writers. Ricken says they are 6 x 5 micr., while Saccardo and Stevenson give them 8-9 x 7-8 micr. One collection from Sault Ste. Marie seems to belong here but the reddish color was not nearly as intense as in Fries' figure.

Section II. Universal veil obsolete or lacking.

**Gills at first whitish or pallid, or tinged slightly with violaceous or grayish.*

394. Cortinarius subtabularis sp. nov.

PILEUS 2-6 cm. broad, campanulate-convex at first, *then plane* or obsoletely umbonate, *discoid, dry, caesious or violaceous-drab* to silvery-fuscous, *silky-shining with white silky fibrils,* even. FLESH thin, soon *pallid.* GILLS adnate then sinuate, rather broad, close but distinct, ventricose, *at first pallid with obscure violaceous tints,* at length cinnamon, never truly violet or purplish, edge entire. STEM 3-5 cm. long, 4-6 mm. thick, *equal except a slight, subabrupt, bulbillate* base, apex slightly scurfy, *pale violaceous-drab,* color persistent, silky-fibrillose and shining, sometimes marked at the base by the remnants of the *white* CORTINA, stuffed, hollowed by larvae, usually strict, later flexuous or curved. SPORES elliptical, scarcely rough, 9-10 x 5 micr. BASIDIA 30 x 7 micr. ODOR none or slight. TASTE mild.

Scattered or gregarious. On the ground among or under fallen leaves of oak and maple woods. Ann Arbor. October-November. Frequent locally.

Characterized by the peculiar, small, abrupt bulblet of the stem and the "erythrinus" or subviolaceous color when fresh. The cap often becomes a little darker or stained in age, while the color of the stem is more apt to persist. It has the stature of an Inocybe. The young gills are scarcely of the "violet" type. It seems to approach *C. tabularis* Fr. and its size and the nature of the cap are fairly well shown by Cooke (Ill., Pl. 783), differing however in the shape of the stem and in color. Old dried specimens sometimes do have the color shown by Cooke's figure. It was found frequently in the region between Ann Arbor and Detroit.

395. Cortinarius brevissimus Pk.

N. Y. State Mus. Rep. 41, 1888.

"PILEUS 1.5-2.5 cm. broad, convex, often irregular, at first minutely silky, then glabrous, *dingy-white to argillaceous.* FLESH whitish. GILLS adnexed, close, *at first pale violaceous* then whitish to cinnamon. STEM *very short,* 1-1.5 cm. long, 6-8 mm. thick, equal, *hollow,* silky-fibrillose, *white,* pale violaceous within. SPORES broadly elliptical, 6-7.5 x 5-6 micr.

"Thin woods. Catskill Mountains, New York. September. Related to *C. brevipes* Pk., but smaller, with a hollow stem and shorter spores."

396. Cortinarius abidifolius Pk.

N. Y. State Mus. Rep. 41, 1888.

"PILEUS 3-5 cm. broad, convex, subglabrous, *whitish tinged with yellow or pale ochraceous,* the epidermis sometimes cracking and forming scales. FLESH thin, whitish. GILLS adnate, emarginate, subdistant, *whitish at first,* then cinnamon. STEM 5-8 cm. long, 4-8 mm. thick, equal or slightly enlarged at base, solid, *white but variegated with yellowish, floccose scales below,* silky-fibrillose above. Spores subglobose, 6-7.5 x 5-6 micr.

"Woods. Catskill Mountains, New York. September."

Closely related to this, if not the same, is a species occurring about Ann Arbor. It differs mainly in its slightly larger size and stouter stem; the shred-like appressed scales of the stem are dingy, not yellowish and the spores are slightly larger, subsphoeroid, 7-9 micr. The cuticle of the pileus is composed of differentiated, narrow, horizontal hyphae, subgelatinous, but scarcely subviscid in moist weather. Its dimensions are as follows: pileus 3-7 cm. broad, stem 5-7 cm. long, 5-12 mm. thick. Both forms differ from *C. ochroleucus* Fr. in the stem being enlarged toward the base and in the scale-like remnants of a universal veil. It should probably be included in the preceding section. It is possible that this is var. (B)

of *C. ochroleucus,* mentioned in "Monographia," p. 57, which is compared with *C. sebaceoides* as to stature and shown as an almost white plant in Fries' figure at the Stockholm Museum.

397. Cortinarius ochroleucus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 775.
Quelet, in Grevillea, Vol. V, Pl. 85, Fig. 1.

"PILEUS 4-5 cm. broad, convex, gibbous and *obtuse,* even, glabrous or minutely silky, *pallid-white.* FLESH firm, white. GILLS broader behind, adnexed, then seceding, *crowded, whitish at first* then argillaceous-ochraceous. STEM 5-7 cm. long, 8-12 mm. thick, solid, firm, *ventricose, white, naked,* except apex which is fibrillose from the cortina." SPORES (8 x 4-5 micr. Massee) rarely given. "ODOR none. TASTE *bitterish.*"

The description given above has been adapted from Fries' "Monographia" and "Hymen. Europ." The species is occasionally reported from this country and is not well understood, not even in Europe if we may take the meager notes into account. The figures referred to have too much of an ochraceous color to agree with descriptions. It seems to be rare as Fries has indicated, and its medium size, ventricose or downward-tapering stem and bitterish taste distinguish it from any American plants I have studied.

398. Cortinarius sericipes Pk.

N. Y. State Mus. Rep. 33, 1880.

"PILEUS 1-2.5 cm. broad, conical to subcampanulate, glabrous, *chestnut color,* often darker on umbo. GILLS ascending or ventricose, narrowed behind, *broad, close, whitish at first,* then tawny to tawny cinnamon, white on edge. STEM 2-7 cm. long, *slender,* 2-4 mm. thick, equal, hollow, silky-fibrillose, slightly mealy at apex, shining, *white.*" SPORES almond-shaped, *large,* rough, 15-16 x 8-9 micr., ventricose, somewhat pointed at ends.

"Damp ground in woods. New York. October."

The type-specimens indicate a slender plant with the Inocybe habit. The spores were found to be narrower than given by Peck. The stem seems to have been subannulate by a white silky zone.

399. Cortinarius castanellus Pk.

N. Y. State Mus. Rep. 29, 1878.

PILEUS 1-2.5 cm. broad, convex then expanded, *umbonate,* innately silky, shining, glabrous, even, *dark cinnamon to chestnut color,* umbo blackish, streaked blackish when old. FLESH thin, pallid. GILLS adnate and rounded behind, then emarginate, close, moderately broad, pallid, *soon cinnamon-brown.* STEM 4-5 cm. long, 2-4 mm. thick, *slender,* equal or attenuated downwards, *dingy white then tinged fuscous,* stuffed then hollow, glabrescent. SPORES elliptical, rough, 7-9 x 4.5-6 micr.

Gregarious or subcaespitose. On bare ground "in open fields" and borders of lakes. Ann Arbor. (Whitmore Lake.) October. Infrequent.

In color it resembles *C. nigrellus* Pk. but that species is almost twice as large, with a distinct universal veil and smaller spores. It is a slender plant, reminding one of the Hydrocybes.

400. Cortinarius basalis Pk.

N. Y. State Mus. Rep. 33, 1880.

"PILEUS 1-2 cm. broad, convex then expanded, *hairy, tawny,* FLESH thin. GILLS subventricose, *pale tawny at first,* cinnamon when old. STEM 2-2.5 cm. long, 5-6 mm. thick, short, hollow, fibrillose, pallid or pale tawny, usually with a slight, webby annulus below the middle of the stem." SPORES elliptical, smooth, 7-8.5 x 3-4 micr., pale under the microscope.

"Naked soil in woods. New York. *Caespitose,* September."

This seems to approach *C. impolitus* in its hairy pileus and in size and color, but that species has larger spores, hygrophanous pileus, shorter stem and grows in coniferous woods. The plants are small and tufted. It probably has pallid gills when very young since the change of color indicated by the description is very unusual.

****Gills at first yellowish, red or cinnamon.* (Usually elegant plants.)

401. Cortinarius cinnamomeus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 777.
Gillet, Champignons de France, No. 204.
Michael, Führer f. Pilzfreunde, II, No. 70.
Ricken, Die Blätterpilze, Pl. 47, Fig. 6.
Hard, Mushrooms, Fig. 239, p. 298, 1908.
Peck, N. Y. State Mus. Rep. 48, Pl. 13, Fig. 7-14.

PILEUS 2-4.5 cm. broad, campanulate-convex, obtuse or subumbonate, umbo often vanishing, *yellowish-cinnamon, yellowish-tawny,* etc., silky or minutely and densely scaly *from the innate or appressed, yellowish fibrils, shining.* FLESH pale citron or straw-yellow, rarely deep-yellow, thin. GILLS adnate, varying to adnexed-emarginate or scarcely subdecurrent, rather *broad,* close (not truly crowded), *cadmium-yellow, citron-yellow or cinnamon-yellow,* shining. STEM 3-8 cm. long, 3-6 mm. thick, *equal,* often flexuous, *chrome to citron yellow when fresh,* darker when handled, fibrillose, stuffed, *becoming tubular,* olive-cinnamon-yellow within, *attached to a yellow mycelium.* CORTINA citron-yellow, fibrillose. SPORES short elliptical, smooth, 6-7.5 x 4-4.5 micr. (few 8 x 5 micr.) BASIDIA 24 x 6 micr., 4-spored. ODOR and TASTE mild.

Gregarious or subcaespitose. On moist rich ground, very decayed wood or mosses, in conifer regions, in sphagnum swamps, or more rarely in frondose woods. Throughout the State, Marquette, New Richmond, Ann Arbor, etc. August-October. Infrequent.

This species is usually marked "common" by the writers of books or lists; a statement which is correct enough if *C. semisanguineus* and its forms are included. The segregated plant as described above even with its variations is rarely common according to my experience in Michigan and about Ithaca and North Elba, New York. It may be more common in special localities. It is quite variable and Fries says "innumerable forms have been set up by authors." The colors and shape vary with the habitat, so that sphagnum forms, e. g., have longer stems and shaded pilei deeper colors. The spores of the American plant seem to be slightly smaller than in those reported by Saccardo, Massee, Ricken, etc., and in

Swedish specimens collected by myself. These have spores measuring 7-8.5 x 4-5.5 micr. The following species seems closely related but differs in the spore-character.

402. Cortinarius cinnamomeus Fr. var.

Illustration: Cooke, Ill., Pl. 778 (as *C. cinamomeus* var.).

PILEUS 2-6 cm. broad, campanulate or subhemispherical, obtuse or discoid, umbonate, regular at first, then wavy-margined, *olivaceous-cinnamon-brown, tinged rufous* on disk, innately and minutely fibrillose-scaly or silky, edge incurved. FLESH yellowish-white, rather fragile. GILLS adnate, *narrow,* close to crowded, cadmium-yellow with olivaceous tint, thin, eroded-crenulate on edge. STEM 5-9 cm. long, 4-7 mm. thick, *slightly enlarged below* and tapering upward, fibrillose-striate, pale yellow, olivaceous-tinged, becoming tubular, yellowish-olivaceous within. CORTINA yellow, fibrillose. SPORES elliptical, smooth, 7-9 x 4-5 micr. ODOR and TASTE mild.

Gregarious. Among mosses in a sphagnum swamp. Bay View, Ann Arbor. August-September. Infrequent.

Differs from *C. cinnamomeus* in the rufous cast on the pileus, the narrow gills, subclavate stem and slightly longer spores. It is well represented by the figure of Cooke cited above. Variety *croceus* is smaller, gills less crowded, gills and stem *tinged olivaceous.* (See Cooke, Ill., Pl. 780.)

403. Cortinarius croceoconus Fr.

Monographia, 1851.

PILEUS 1-3 cm. broad, *obtusely conico-campanulate,* umbo persisting, firm, *rufous-fulvous to fulvous-cinnamon,* silky, *dry,* even, subshining, margin incurved. FLESH whitish, tinged red at the upper surface, yellowish toward stem, thick at umbo, thin elsewhere. GILLS adnate then somewhat seceding, ascending, rather narrow, close, *pale yellow at first, then cinnamon,* opaque, edge minutely eroded. STEM elongated, 5-12 cm. long, 3-5 mm. thick, *equal, flexuous,* fibrillose with rufous-fulvous fibrils, *yellowish within,* elastic, stuffed then tubular. CORTINA pale rufous-fulvous, becoming pallid, subfibrillose. SPORES elliptical, almost smooth, 8-9.5 x 5 micr.

Gregarious or subcaespitose. On low, mossy ground of pine, poplar, etc., near Stockholm, Sweden. September, 1907.

This species has been reported at various times in America. The figures of Cooke (Ill., Pl. 780) and of Gillet (No. 210, Champignons de France) are, however, very misleading. The above description was made from plants which I collected near Stockholm. It seems probable to me that errors have been made in referring plants to this species and that a full description at this place of what is undoubtedly the Friesian plant is desirable.

404. Cortinarius luteus Pk.

N. Y. State Mus. Rep. 43, 1890.

"PILEUS 2-5 cm. broad, conical or convex, unpolished, *yellow,* often darker on disk. FLESH yellow. GILLS adnexed, yellow, *subdistant,* moderately broad. STEM equal, 5-10 cm. long, 10-20 mm. thick, *stout, solid* (!), silky-fibrillose, *yellow.* SPORES subglobose or broadly elliptical, 7.5 x 6-7 micr.

"Mossy woods. New York. July."

This seems to be closely related to the preceding, but the stem is stouter and the type-specimens show the gills to be subdistant and rather broad. The spores are also somewhat different.

405. Cortinarius aureifolius Pk.

N. Y. State Mus. Rep. 38, 1885.

PILEUS 1-4 cm. broad, convex-campanulate, then plane, *cinnamon-brown* or darker, dry, densely fibrillose-tomentose, sometimes scaly, especially on disk. FLESH thin, yellowish brown or pallid. GILLS adnate, subventricose, *broad,* close, thin, *yellow then ferruginous-cinnamon.* STEM 3-6 cm. long, 3-6 mm. thick, subequal, rather short, solid, fibrillose, *yellow,* brown within. SPORES 10-12.5 x 5 micr., *oblong,* smooth, ochraceous-cinnamon in mass. ODOR of *radish.* TASTE mild.

"Sandy soil, in thin pine woods." New York, Massachusetts. October. Specimens sent to me from Massachusetts were apparently this species except that they had more slender stems than the type. As Peck has already pointed out, the species reminds one of an Inocybe and the peculiar oblong spores are further evidence of such a position for it. It seems to be rare and needs more study.

406. Cortinarius croceofolius Pk.

N. Y. State Mus. Bull. 150, 1911.

Illustrations: Ibid, Pl. VI, Fig. 1-8.

"PILEUS 2.5-5 cm. broad, broadly convex or nearly plane, obtuse or obtusely umbonate, dry, *slightly fibrillose* especially on the margin, *brownish-cinnamon,* often paler or saffron-yellow on the margin. FLESH thin, pale yellow, grayish or dingy when dry. GILLS thin, close, *saffron-yellow verging to orange at first,* then brownish-cinnamon, often yellow, crenulate on margin. STEM 2.5-4 cm. long, equal or slightly thickened at the base, fibrillose above, *saffron-yellow,* hollow. CORTINA concolor. SPORES broadly ellipsoid, 6-7 x 4-5 micr.

"Mossy ground on the borders or in woods of spruce and balsam fir. New York. September."

This approaches *C. cinnamomeus* in some of its forms except that the gills are more deeply colored.

407. Cortinarius malicorius Fr.

Epicrisis, 1836-38.

Illustration: Fries, Icones, Pl. 155, Fig. 1.

PILEUS 2-6 cm. broad, obtusely convex to subexpanded, *fulvous or tawny-fulvous,* tinged golden yellow, *silky-tomentose,* subzonate in age. FLESH *intensely olivaceous* when fresh, scissile, thick on disk. GILLS sinuate or adnate-subdecurrent, close, not broad, *rusty-yellow then dark golden-fulvous.* STEM 5-7 cm. long, 6-12 mm. thick, equal or subequal, *becoming hollow,* fibrillose from the *orange-fulvous cortina,* tinged olivaceous, *soon yellow-fulvous,* or reddish-stained, *olivaceous within.* SPORES short elliptical, slightly rough, 6-7 x 4-4.5 micr. ODOR and TASTE mild.

Gregarious. Under hemlock and cedar in swampy woods. Sault Ste. Marie. August. Rare.

The Michigan plants had all the characters attributed to the species by Fries. The flesh of the growing plant is distinctive. In the pileus it is intensely olivaceous to greenish, bordered by a narrow zone of yellow or fulvous next to the surface; in the stem the axis soon breaks down leaving a tubular cavity, the rest of the flesh being yellowish-olivaceous, bordered by the narrow, yellow cuticular zone

which is well shown in Fries' figures. There is a tendency for the cap and stem to become stained dark reddish in age. Ricken has changed the description somewhat as to the color of the young gills. In our plants, however, they were not olive-yellow although such a variation is to be expected where the flesh has that color. Ricken also gives spore-measurements which are too large for those of my collection. A variety of *C. cinnamomeus* was found under white pine and beech at New Richmond, which was fulvous on the cap and stem and with a slight olive tinge on the gills. A series of intermediate forms between this and *C. cinnamomeus* seems to exist.

408. Cortinarius semisanguineus Fr.

Syst. Myc., 1821 (as var. of *C. cinnamomeus*).

Illustrations: Cooke, Ill., Pl. 779.
Gillet, Champignons de France, No. 250.
Atkinson, Mushrooms, Fig. 151, p. 162, 1900.
White, Conn. State Geol. & Nat. Hist. Surv., Bull. 3, Plate 20, 1905.
Peck, N. Y. State Mus. Rep. 48, Pl. 13, Fig. 15-20, 1896.

PILEUS 2-6 cm. broad, campanulate-convex, subumbonate, (varying to conic-campanulate or broadly hemispherical, often at length expanded and split on margin) *tawny-yellow to cinnamon-yellow,* silky or delicately fibrillose-scaly, sometimes shining-zoned. FLESH dingy yellowish-white, rather firm. GILLS adnate-subdecurrent, *narrow, crowded, cinnabar or blood-red.* STEM 3-6 cm. long (longer on sphagnum), 3-6 mm. thick, equal or subequal, solid-fibrous, chrome to citron-yellow, fibrillose from the *yellow or tawny-yellow* CORTINA, elastic. SPORES elliptical, smooth, 5-7 x 3-4 micr. BASIDIA 24 x 6 micr., 4-spored. ODOR and TASTE mild.

Gregarious or subcaespitose. In low moist swamps, sphagnum, etc. Throughout the State. August-October. Frequent.

Usually considered a variety of *C. cinnamomeus.* There are some forms which could be called varieties of this in turn. This shows that in the present group we have what is well known to exist in the higher plants, namely, an innumerable number of very closely related species, or varieties, or forms, or any other term which expresses difference. For convenience we group a larger or smaller number of these "different" but almost like forms together and call them species. As details accumulate it is easier to keep the details in

mind if we make several species from an old group of one species. Hence varieties are raised to the rank of species, and forms to the rank of variety, etc. This method is not used by the theoretical biologist but is very useful for practical every day arrangements for study. The above species is easily distinguished as such in the majority of cases hence it is now kept distinct. In order to produce fundamental proof that *C. cinnamomeus* and *C. semisanguineus* are one and the same species, absolutely expressed, it would be necessary to grow one kind from spores derived from the other kind.

409. Cortinarius cinnabarinus Fr.

Epicrisis, 1836-38.

Illustrations: Fries, Icones, Pl. 154, Fig. 4.
Gillet, Champignons de France, No. 203.
Patouillard, Tab. Analyt., No. 647.
Quelet, in Grevillea, Vol. VII, Pl. 110, Fig. 4.
Ricken, Die Blätterpilze, Pl. 47, Fig. 5.

PILEUS 3-6 cm. broad, campanulate, umbonate, sometimes plane, innately *silky-shining, bright cinnabar-red,* dry, even or rimose, sometimes split on margin. FLESH pallid-reddish, fading. GILLS adnate, then emarginate, *rather broad,* ventricose, subdistant, *cinnabar-red* then dark rusty-red, velvety-shimmering, edge entire. STEM 2-5 cm. long, 4-8 mm. thick, equal or tapering upward, *cinnabar-red,* shining, stuffed then hollow, fibrous, fibrillose. CORTINA concolor. SPORES elliptical, slightly rough-punctate, 7-9 x 4.5-5.5 micr. BASIDIA 36 x 7, 4-spored.

Gregarious or scattered. On the ground, in frondose woods, almost exclusively *in oak woods.* Throughout the State; Marquette, Ann Arbor, New Richmond, etc. July-August. Frequent (rare September and October).

This is one of the early Cortinarii of the season. It frequents rocky or hilly oak woods and in this respect shows a preference which is different from that of the same species in Europe where it is said by Ricken and Fries to occur almost exclusively in beech woods. As data from beech woods in this country are lacking this may also be true here but not so far as my own observation extends. This preference might seem to indicate a mycorhizal connection with the oak roots, but so far every examination showed that the reddish mycelium merely vegetates in the leaves and humus.

The species is quite distinct from the preceding ones inasmuch as every part is at first cinnabar-red. This color is dissolved out by a weak solution of caustic potash; and this is also true of *C. semisanguineus* and even of some of the preceding species in which the red color is otherwise obscured. The nearest approach to it is *C. sanguineus* Fr., which I collected near Stockholm and in the Adirondack Mountains.

409b. Cortinarius sanguineus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 786.
Gillet, Champignons de France, No. 246.

PILEUS 2-4 cm. broad, obtuse, or umbonate, campanulate, dry, innately silky or minutely scaly, opaque, *dark blood-red.* FLESH blood-red, thin on margin. GILLS adnate, rather broad, close, dark blood-red. STEM 5-10 cm. long, 3-7 mm. thick, elongated in moss, equal or tapering, stuffed then hollow, *relatively slender,* blood-red, darker where bruised. CORTINA fibrillose, tinged red. SPORES narrow-elliptical, 7-8 x 4-5 micr., tinged red, roughish. ODOR mild; TASTE slightly like radish.

Gregarious in deep moss or sphagnum in conifer woods.

Isle Royale, Sault Ste. Marie, etc., mostly in the northern part of the State. Infrequent.

Distinguished from *C. cinnabarinus* by its habitat, its longer stem and more blood-red color. European authors do not emphasize the mossy habitat, but with us this seems to be the usual place of growth.

The color of every part of this species is dark blood-red, the pileus is silky-scaly and not as broad as that of *C. cinnabarinus,* the stem is more slender and usually longer; the spores are similar. It grows on thick moss or sphagnum under conifers. Ricken gives measurements which are too large for the Swedish plant. Peck's specimens, reported in the 23d Report, are doubtless *C. cinnabarinus.*

*****Gills at first greenish or olivaceous.*

410. Cortinarius raphanoides Fr. var.

Syst. Myc., 1821.

Illustration: Cooke, Ill., Pl. 833 (typical).

PILEUS 1.5-4 cm. broad, campanulate-convex, *obtuse,* then subexpanded and subumbonate, not striate, *densely innately fibrillose-hairy,* unicolorous, *light brownish olive* (Ridg.), scarcely shining, margin decurved. FLESH thin except disk, concolor, fading. GILLS adnate then emarginate, close, rather broad, *at first chrysolite-green* (Ridg.), then darker, thickish, edge entire. STEM 7-10 cm. long, 3-5 mm. thick, *equal,* stuffed then hollow, *olivaceous,* concolor within, fibrillose, mycelioid at base and attached to sphagnum. CORTINA olivaceous. SPORES 8-9 x 5-6 micr., oval-elliptical, slightly rough. ODOR and TASTE *mild* or slight.

Gregarious-scattered on sphagnum moss in balsam and tamarack swamps. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Rare.

The typical *C. raphanoides* is said to have a strong radish odor and acrid taste. These were lacking in our plants, and only in some respects is it very close to that species. Its sphagnum habitat in conifer woods also seems to point to a distinct species. It differs from *C. valgus* in its fibrillose hairy pileus and stature. No such plant is described from the United States. There are no violaceous hues present.

SUBGENUS TELAMONIA. Pileus *hygrophanous,* its color changing on losing moisture, not viscid, glabrous or *sprinkled on the margin with the superficial fibrils of the universal veil;* flesh relatively thin, scissile. Stem *peronate or annulate* from the remains of a universal veil.

This and the following subgenus are closely related by the hygrophanous character of the pileus, by which they are both separated from the subgenera Inoloma and Dermocybe. To quote Ricken: "By 'hygrophanous' we designate a pileus whose surface is not compact but composed of loose tissue which absorbs water readily and when soaked with moisture has quite a different color than when dried out. After several experiences this peculiarity is recognized at the first glance. If one is uncertain about it, the plants collected in dry weather are placed in a dish of water," and then allowed to dry

again. The presence of a universal veil separates this subgenus from Hydrocybe. This veil is composed of a thin, woven, slightly membranous texture and extends from the base of the stem in the young plant over the marginal portion of the pileus. On its inner surface it is continuous with the *cortina,* at least part way. As the plant expands the veil collapses, sometimes adhering to the stem in the form of a sheath (peronate) sometimes leaving only remnants along the stem and often indicating its presence by delicate superficial fibrils on or toward the margin of the pileus. Since the cortina itself, when copious, may leave a slight ring on the stem of those species which belong to the subgenus Hydrocybe, one has to become familiar with the characteristics of the two veils—universal veil and cortina—in order to refer a species properly. This subgenus includes a number of large species, but many others are of medium to small size. The Michigan species of this group are not yet very well studied and a number of collections belonging here are for the present omitted. For this reason the following arrangement must be considered temporary.

Section I. Plants wholly or in part with violet, purplish or ashy hues.

411. **Cortinarius torvus** Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 157.
Cooke, Ill., Pl. 801.
Gillet, Champignons de France, No. 251.
In Grevillea, Vol. VII, Pl. 117, Fig. 2.
Ricken, Die Blätterpilze, Pl. 49, Fig. 6.
Plate LXXXIII of this Report.

PILEUS 4-6 cm. broad (rarely broader), broadly convex to plane, obtuse or subumbonate, firm, *subhygrophanous, violaceous-fulvous, purplish-brown or copper-brown at first,* at length paler, disk rusty-fulvous, *covered with a hoary frostiness,* sometimes furfuraceous-scaly, at length glabrous, sometimes radiately wrinkled, often punctate. FLESH at first dull grayish-purple at length brownish or pallid. GILLS at first adnate, then emarginate-adnexed, *broad, subdistant,* thickish, subrigid, *dark or dull purplish at first,* then dark cinnamon-umber. STEM 4-7 cm. long (sometimes longer), 7-8 mm. thick above, *clavate-bulbous,* tapering upward, bulb 12-16 mm. thick, *peronate* to or above the middle by the whitish, universal veil, which terminates above in a flaring, membranous ring, *dull violaceous and silky above the veil, spongy-solid.* SPORES 8-11 x 4.5-6 micr., ventricose-elliptical, rough-tuberculate, *maturing slowly,* rusty-umber in mass. BASIDIA 36 x 6-7 micr. ODOR at first slight, *sweet-aromatic* after crushing the flesh. TASTE mild.

Gregarious or subcaespitose. Among humus and decayed debris in frondose or pine woods. Houghton, New Richmond, Detroit. August-September. Infrequent.

Well marked by the peculiar, though variable color, broad gills and the membranous, annular-terminated sheath of the stem. The young plants have a very bulbous stem which becomes clavate-elongated. Two forms occur as to the shape of the stem, a short-stemmed, stocky, bulbous form and a long-stemmed one in which the bulb has almost disappeared; the former seems to be more frequent and is shown by the figure in Grevillea and by our own plate. The figure in Fries' Icones represents much larger specimens than usually occur with us. Maire points out (Bull. d. l. Soc. Myc. de France, Vol. 26, p. 27) that it is distinguished from the European *C. impennis* Fr. by its membranous annulus. The stem is often curved at the swollen base and is sometimes ventricose. Its odor reminds one of faintly aromatic substances. The spores may easily be given too small since they mature slowly. Ricken says they measure 8-9 x 5-6 micr. Peck has a variety *"nobilis,"* which may be a distinct species; it needs further study.

412. **Cortinarius plumiger** Fr.

Epicrisis, 1836-38.

PILEUS 5-12 cm. broad, firm, campanulate, rarely conical-campanulate, obtuse or subumbonate, expanded, *densely appressed, fibrillose-tomentose or fibrillose-hairy,* hygrophanous, fading, sepia-brown at first then light pinkish-cinnamon (Ridg.), margin often decorated by narrow shreds of the universal veil. FLESH thick on disk, thin toward margin, pallid brownish (moist) soon faded. GILLS adnate then emarginate, close, *rather broad,* pallid at first, rarely faintly tinged caesious-violaceous, then *clay color* to mikado-brown (Ridg.), edge subcrenulate or entire. STEM 5-10 cm. long, 10-18 mm. thick above, clavate-bulbous, *stout,* at length subcylindrical above, spongy within but firm, *very fibrillose, grayish-blue-violet* (Ridg.) when fresh, quickly fading, concolor within, at length

pallid or dingy. CORTINA whitish, thin. UNIVERSAL VEIL white at first, leaving thin subannular shreds or a slight annulus on the lower part of stem, soon sordid brownish. SPORES elliptical, slightly rough, 8-10 x 5-6 micr., pale ochraceous under microscope. ODOR and TASTE slight.

Gregarious. Bulb imbedded in wet moss and soil under spruce and balsam trees. North Elba, Adirondack Mountains, New York. August-September, 1914. Collection Kauffman. Frequent locally.

Well marked by the dense tomentosity of the cap when young and by the pallid gills. Even under the most favorable conditions the violet-bluish tint of other parts than the stem was scarcely noticeable. It agrees well with the Friesian description, but is not the plant of Quelet (Grevillea, Vol. 7, Pl. 112, Fig. 1), nor that of Ricken. At times the hygrophanous character is deceptive as the cap becomes darker with age. The universal veil is thin in small plants and the species could be looked for under Inoloma. It differs from *C. canescens* by its spores and by the violaceous stem when young. It is possible that *C. catskillensis* is a dry weather form of this species.

413. Cortinarius evernius Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 866.
Ricken, Die Blätterpilze, Pl. 49, Fig. 2.
Hard, Mushrooms, Fig. 246, p. 305, 1908.

PILEUS 3-10 cm. broad, *fragile, conico-campanulate,* prominently umbonate when expanded, *hygrophanous,* sometimes irregular or gibbous, *purple-fuscous to brownish-vinaceous* (Ridg.), faded and silky in dry weather, margin soon wavy, at first incurved and silky from the veil, glabrescent. FLESH thin, concolor or violaceous when moist. GILLS emarginate, adnate, thickish, *broad, rather distant,* ventricose, *at first violaceous-purple* then cinnamon-brown, edge whitish. STEM 10-15 cm. long (rarely 15-20 cm.), 8-20 mm. thick, *cylindrical or attenuated toward base,* sometimes flexuous, *pale lavender to deep violet,* more deeply colored at the base, *marked by annular shreds* of the *violaceous then whitish universal veil* over most of the surface, spongy and solid, concolor within. SPORES elliptical, slightly rough, 8-9.5 (rarely 10) x 5-6 micr. ODOR slightly of radish. CORTINA fibrillose, whitish, evanescent.

Gregarious or subcaespitose. On moss, decayed debris and humus in coniferous woods. Bay View, Marquette and North Elba, New York. August-September. Infrequent—almost rare.

Known by its elongated stem, which is usually rather stout and tapering at the base; the young, conical pileus is scarcely wider than the stem. It differs from related species in the shape of the pileus. In dry weather the color is often pale violaceous, shading to lavender and when old the pileus is likely to be split on the margin. The violaceous universal veil collapses and forms thin and adnate annular patches above the stem, scarcely ever forming a membranous annulus as in *C. umidicola.* The description of our plants differs somewhat from the European descriptions in the differently shaped spores and stem although Fries says the stem is sometimes attenuated below. The unpublished plate of Fries at the Stockholm Museum shows a much deeper violet color than the figures of Cooke. The inconsistency of the spore-sizes and spore shapes of European authors indicates that the species is not clearly understood. Fries states that the stem has the characteristics of *C. elatior* Fr., but, except for its mode of development, this is not strikingly apparent in our plants. When deeply imbedded in moss the stems are very long.

414. Cortinarius umidicola Kauff.

Bull. Torr. Bot. Club, Vol. 22, 1905.

Illustrations: Ibid, Fig. 4, p. 312.
Jour. of Mycology, Vol. 13, Pl. 94, 1907.
Mycological Bull., Vol. V, Fig. 239, 1907.

PILEUS 5-10 cm. broad, (rarely up to 14 cm.), hemispherical then convex-expanded, firm, *hygrophanous, dull heliotrope-purplish at the very first,* soon umber and glabrous on disk, *fading to pinkish-buff* and covered with innate, whitish, silky fibrils, *punctate,* margin persistently incurved and decorated by narrow, whitish, transverse strips from the universal veil. FLESH lavender when young, soon faded to sordid whitish, thick on disk, abruptly thin on margin. GILLS emarginate with tooth, very broad, plane then ventricose, subdistant, thick, *at first lavender,* soon pale-tan to cinnamon, edge subserratulate, concolor. STEM 6-10 cm. long, (rarely 10-13 cm.), 10-20 mm. thick, subequal, usually thickened below, sometimes narrowed below or curved, always *stout,* solid, *lavender above the woven, sordid white universal veil* which at first covers the lower part as a sheath, but soon breaks up so as to leave a

band-like annulus half-way or lower on the stem, or forming adnate patches, concolorous, lavender within and soon cavernous from grubs. CORTINA violaceous-white. SPORES elliptic-ovate, slightly rough, 7-9 x 5-6 micr. BASIDIA 40 micr. long.

Gregarious, often in troops or partial rings. In wet, swampy places, frondose or mixed woods. Marquette, Houghton, Detroit. July-September. Infrequent.

This species is probably identical with one occurring in Europe. I collected a very similar plant, with the same gregarious habit, near Stockholm, Sweden, while in company with Romell, Maire and Peltereux, who did not recognize it as a species definitely known to them. It had the same spores, and all the characters of the American plant except the less marked lavender color. I suspect it is *C. lucorum* Fr. Two other collections from Sweden brought to this country and labeled *C. impennis* Fr., the one determined by Robert Fries with spores like *C. umidicola,* the other determined by Romell, with spores measuring 11-12 x 6-7 micr., seem to show that two similar species are being confused in Europe. One of these corresponds to *C. umidicola,* and is well illustrated by Gillet (Champignons de France, No. 228), the other is the true *C. impennis* Fr. (Icones, Pl. 157, Fig. 2). If this inference is correct, then Ricken's description of *C. impennis* also applies to the former species. The taste of the plants which I collected in Sweden was like ours, not of radish. The unpublished plate of *C. lucorum* Fr. in the museum at Stockholm represents a plant very much like *C. umidicola* with several band-like rings on the stem. Cooke's figure (Pl. 1192, Ill.) seems to belong elsewhere.

415. Cortinarius scutulatus Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 158.
Cooke, Ill., Pl. 820.
Gillet, Champignons de France, No. 249.
Ricken, Die Blätterpilze, Pl. 49, Fig. 1.

PILEUS 2-4 cm. broad, at first subhemispherical and sometimes gibbous, then campanulate, firm, *brittle,* hygrophanous, *dark-purplish-chestnut or smoky-violet-umber,* unicolorous, becoming canescent with grayish-white innate fibrils, inflexed margin at first silky. FLESH concolor under cuticle, soon whitish elsewhere.

GILLS adnate then emarginate, rather broad, *subdistant,* thickish and rigid, *at first pale smoky-purple* then dark rusty-umber. STEM 3-7 cm. long, 4-10 mm. thick, *equal* or subattenuate below, *rather stout,* sometimes slender, rigid, thinly *peronate at first by the grayish-white or purple-tinged universal veil,* soon subannulate by the breaking up of the veil, at length silky-fibrillose, solid. CORTINA whitish. SPORES short elliptical, almost smooth, 7-8 x 4-4.5 micr. BASIDIA 30 x 7 micr., 4-spored. ODOR none.

Gregarious. On open sandy soil under poplar. New Richmond. September. Rare.

I have referred this collection here with some hesitation. The plants are well illustrated by the figures of Gillet and Ricken. The illustrations of Fries are apparently from selected and perfect plants such as are more common in the moist climate of Sweden than in that of our State. The description given above applies to plants entirely different from any other species of the group by their peculiar colors, the brittle flesh and the habitat. It differs most from the European descriptions in the absence of the radishy odor. It seems to have some relationship with *C. sciophyllus* Fr., but the spores of that species, according to Battaile (Bull. d. l. Soc. Myc. de France, Vol. 26, p. 336), measure 8-9 x 6-8 micr.

416. Cortinarius deceptivus Kauff.

Bull. Torr. Bot. Club, Vol. 32, 1905.

Illustrations: Ibid, Fig. 7, p. 324.
Plate LXXXIV of this Report.

PILEUS 2-7 cm. broad, suborbicular to hemispherical, becoming convex-campanulate, *subhygrophanous, fawn-colored tinged with lavender,* fading to light tan, disk alutaceous-buff, covered with minute, brownish scales when young, becoming glabrous, rugulose in age. FLESH thin except on disk, rather spongy, *lavender when young,* then pallid or sordid tan. GILLS 3-5 mm. broad, thick, moderately close, adnate, emarginate, narrowed in front, *lavender at first,* pale tan when old. STEM 3-6 cm. long, rather stout and clavate at first, then elongated and slender, solid, *at first covered by the thick, fibrillose universal veil, which is lavender,* soon fading to whitish, at length remaining as oblique, fugacious, brownish scales or partial rings, terminating above in the cortina. SPORES

7-9.5 x 6-7 micr., subsphoeroid to broadly elliptical, rough. ODOR mild.

Gregarious. On moist humus or debris in hemlock or mixed woods. Ann Arbor, Marquette, Bay View, etc. August-October. Frequent.

This species is close to *C. anomalus* Fr., indeed it may be considered as a hygrophanous form of that species. The group to which it belongs is composed of a number of closely related species, unless one considers the fluctuating variation of the one species as quite extensive. The colors of this species are much deeper violet or lavender at first than in the typical *C. anomalus* and the flesh is distinctly hygrophanous. Nearly all these related plants (see *C. anomalus*) have a punctate pileus.

417. Cortinarius adustus Pk.

N. Y. State Mus. Rep. 42, 1889.

"PILEUS 2-3.5 cm. broad, broadly campanulate or convex, obtuse, *hygrophanous, bay-brown when moist* sometimes canescent on the margin, paler when dry, smoky-brown with age and generally rimose-scaly. FLESH yellowish-gray. GILLS subfree, rather thick, distant, *purplish-brown.* STEM 2-8 cm. long, 6-10 mm. thick, *equal,* stuffed or hollow, fibrillose, brownish with a white mycelioid coating at the base, colored within like the flesh of the pileus." SPORES broadly elliptical, 8-10 x 5.5-6.5 micr.

"Subcaespitose. In balsam groves. New York. September."

The dried type-specimens are blackish-brown, showing a rather stout stem and small pileus. It seems closely related to the next.

418. Cortinarius griseus Pk.

N. Y. State Mus. Rep. 41, 1888.

"PILEUS 2-7.5 cm. broad, convex, obtuse or gibbous, fibrillose-scaly with grayish hairs or fibrils, pale gray when moist. GILLS adnexed, subdistant, *at first pallid then* brownish-ochraceous. STEM 5-7 cm. long, 6-12 mm. thick, tapering from *a thickened or bulbous base,* silky-fibrillose, whitish." SPORES broadly elliptical, obtuse, 10-12 x 6-7 micr.

"Mossy ground under balsam trees. New York. September.

"The fibrils of the pileus are similar to those of *C. paleaceus,* but the plant is much larger and stouter and the spores are larger. It is well marked by its grayish color." The color of the young gills distinguishes it from *C. adustus* and *C. scutulatus.* It seems to approach *C. canescens* in all its characters except the lack of a peronate stem.

419. Cortinarius subflexipes Pk.

N. Y. State Mus. Rep. 41, 1888.

PILEUS 1-2 cm. broad, *conical* then campanulate and subacutely umbonate, glabrous, *hygrophanous, blackish-brown* and the thin margin incurved and whitened by the veil *when moist,* subochraceous when dry. FLESH concolor, thin. GILLS adnexed, thin, close, rather broad, ventricose, *at first clay-color tinged violaceous* then cinnamon. STEM 3-6 cm. long, 2-4 mm. thick, equal, *slender,* flexuous, silky-shining, violaceous within, subannulate by the whitish universal veil, *pale violaceous when young,* especially above the annulus, pallid or reddish when old. SPORES narrow elliptical, scarcely rough, 6-7.5 x 3.5-4 micr.

Thin woods. North Elba, Adirondack Mountains and Catskill Mountains, New York. September.

Hardly related to *C. flexipes,* from which Peck separated it because of its more glabrous pileus and different gills. It has the stature of *C. fuscoviolaceus.*

420. Cortinarius flexipes Fr. minor

Syst. Myc., 1821.

Illustrations: Ricken, Blätterpilze, Pl. 49, Fig. 4.
Quelet, Grevillea, Vol. VIII, Pl. 113, Fig. 3.

PILEUS 1-3 cm. broad, at first conical then *conic-campanulate,* hygrophanous, ground-color cinnamon-brown, *densely covered with shining grayish-white subagglutinate fibrillose scales* up to the apex of the *acute umbo,* scales small, superficial and easily rubbed off. FLESH at the very first violaceous, soon pallid or brownish. GILLS adnate-emarginate, *at first or when moist walnut-brown* (Ridg.) *with a purplish tint,* soon sudan-brown (Ridg.), broad, close to subdistant, edge entire, at first whitish. STEM 3.5-5 cm. long, 2-4 mm. thick, at first strict then flexuous, stuffed then hollow, dark violaceous at apex, soon grayish-brown, *annulate by a distinct*

white annulus above the middle, concentrically subannulate below with white flecks, at first violet within. SPORES elliptical, pale, 7-7.5 x 4-5 micr., slightly rough, pale ochraceous. ODOR and TASTE none.

Gregarious. In low swamps under spruce in moss. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Infrequent.

This is a pretty plant. When fresh the general effect of the pileus is that of a scaly-capped smoky-gray or drab-gray Inocybe. The universal veil leaves a well-marked annulus. The species seems to be taller and slightly larger in Sweden according to Fries. The pileus is more densely fibrillose than that of *C. paleaceus* from which it differs also in the dark-colored gills when young. The figure of *C. paleaceus* in Icones (Pl. 160, Fig. 4) is an exact reproduction of the size, shape and habit of our form of *C. flexipes.*

Section II. Universal veil red, tawny, cinnamon or yellow.

421. Cortinarius rubripes Kauff.

Rep. Mich. Acad. of Sci., 1906.

Illustrations: Bot. Gaz., Vol. 42, 1906.
Jour. of Mycol., Vol. 13, Pl. 100, 1907.

PILEUS 5-12 cm. broad, convex-campanulate then expanded, hygrophanous, *watery-cinnamon when moist, or tinged rufous,* obtuse or subumbonate, more or less ferruginous-stained, fading to pinkish-ochraceous, in zones from the umbo outward, at length with innate, silky-shining fibrils, sometimes wavy and irregular, *glabrescent,* even. FLESH thin except on disk, scissile, with a rufous tinge. GILLS *subdistant,* distinct, rather rigid, adnate, seceding in age, often with hoary fibrils at point of attachment to stem, *pale cinereous-purple or rufous-tinged at first,* soon reddish-cinnamon, edge entire. STEM 5-7.5 cm. long, with an oval or clavate bulb, 5-15 mm. thick at apex, *bulb deep brick-red to vermillion,* paler upwards, elastic, spongy-stuffed within, *glabrous, except for the fibrillose remains of the thin, evanescent, pale reddish, universal veil.* SPORES elliptical, smooth, granular within, 8-9 x 4-5 micr. BASIDIA 30-35 x 7 micr., 4-spored. MYCELIUM *brick-red* and sometimes forming mycorhiza on roots of forest trees.

Gregarious or subcaespitose. On the ground in frondose woods. July-September. Ann Arbor. Frequent locally.

Well marked by the tinge of brick-red which pervades the whole plant on drying and shades into a deep red towards the base of the stem. The hygrophanous character is unmistakable. The universal veil is not always manifest. This species approaches the European *C. bulliardi* Fr. and *C. colus* Fr. From the former it is to be separated by the hygrophanous pileus and the spores. It is, however, uncertain what the spore-size of the Friesian plant really is. Ricken refers a plant to *C. bulliardi* whose spores measure 6-7 x 3-4 micr., "spindle-almond-shaped." Others give larger spores, and apparently deal with a different species. Boudier (Icones), gives a figure of *C. bulliardi* which resembles our plant closely. *C. colus* Fr. appears to differ in the absence of the universal veil and, according to Ricken, in the slightly larger spores, and its gills are without any purplish tint. It is similar in its "fiery-red" mycelium, and general aspect (see Pl. 50, Fig. 6, Die Blätterpilze). To add to the confusion, Peck described a species sent to him under the name *C. rubripes* Pk. (N. Y. State Mus. Bull. 105, 1906), which he says is related to *C. cinnabarinus.* It has violaceous gills when young, a grayish-ferruginous to pale alutaceous pileus, and bright red stem. The spores measure 7.5-10 x 5 micr. It is a smaller plant than any of the others mentioned. For the present our plant must be considered a distinct species.

422. Cortinarius armillatus Fr. (Edible)

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 158.
Cooke, Ill., Pl. 802.
Gillet, Champignons de France, No. 197.
Ricken, Die Blätterpilze, Pl. 48, Fig. 5.
Michael, Führer f. Pilzfreunde, II, No. 71.
Marshall, Mushroom Book, Pl. 32, p. 86, 1905.
Hard, Mushrooms, Fig. 243, p. 301, 1908.
Plates LXXXV, LXXXVI of this Report.

PILEUS 5-12 cm. broad, campanulate with decurved margin, then expanded, not truly *hygrophanous, tawny rufescent to red-brick color,* moist when fresh, innately fibrillose or minutely scaly, with shreds of the universal veil often clinging to the margin, sometimes glabrescent. FLESH rather spongy, not very thick considering its size, dingy pallid. GILLS adnate, sometimes sinuate and un-

cinate, *broad,* distant, *pale cinnamon at first, then dark* rusty-brown. STEM 7-14 cm long, *clavate or elongated-bulbous,* 10-20 mm. thick at apex, up to 35 mm. thick below, solid, firm, fibrillose, brownish or pale tawny-rufescent, *encircled by several cinnabar-red zones or bands from the rather membranous red universal veil.* CORTINA at first whitish, collapsing, and forming a slight annulus colored by the spores. MYCELIUM whitish. SPORES elliptical, rough-tuberculate, 10-12 x 5-6.5 micr. BASIDIA 35 x 8 micr., with long, slender sterigmata. ODOR more or less of radish. TASTE mild.

Solitary or gregarious. On thick humus, debris, very rotten wood, etc., in the coniferous forests of northern Michigan. Isle Royale, Huron Mountains, Marquette, Bay View. July-September. Frequent.

A noble species. It is the chief of this group, as already noted by Fries. The 2-4 reddish bands, scattered along the stem, mark it conspicuously. Its large size and tawny-rufescent color help to distinguish it readily from others of the subgenus. The lack of the hygrophanous character and the rather scaly pileus at times ally it to the Inolomas with which it is more easily confused, but the texture of the pileus and its general characteristics show it to belong to the subgenus Telamonia. I have not seen it in the southern part of the State, although it probably occurs wherever hemlock trees and other conifers are native. Some consider *C. haematochelis* Fr., which has a single red zone on the stem, as identical.

423. Cortinarius morrisii Pk.

Bull. Torr. Bot. Club, Vol. 32, 1905.

PILEUS 3-10 cm. broad, convex then campanulate-expanded, *hygrophanous,* wavy or irregular on the margin, *dark ochraceous or tawny-ochraceous,* covered with minute, silky fibrils, radially rugose at times. Flesh thin except on disk, *yellowish.* GILLS adnate then emarginate-adnexed, rounded behind, *broad,* subdistant, yellow at first, then rusty-cinnamon, edge eroded. STEM 6-10 cm. long, *equal or subequal,* 8-20 mm. thick, stout, solid, fibrous-fleshy, *yellow within,* whitish or pale yellow above, *yellow to ochraceous* and becoming ferruginous to blackish-umber below, *imperfectly annulate by adnate shreds of the yellowish universal veil.* SPORES oval or broadly-elliptic, slightly rough, with an oil-globule, 7-9 x 5.5-6 micr., (rarely up to 10 x 7). ODOR weak, of radish.

"Moist shaded woods, under hemlock trees. Massachusetts. August-October."

The above description was made from specimens sent to me by G. E. Morris in whose honor Peck named it. The yellow color of the flesh, and the tendency of the cap and stem to become rusty in age is a marked characteristic. The caps of dried specimens are blackish-umber-brown. I have not seen it in Michigan.

424. Cortinarius mammosus sp. nov.

PILEUS 2-8 cm. broad (mostly 4-6 cm.), *conico-campanulate at first,* then expanded and obtusely *umbonate, hygrophanous,* fawn-color to brownish-cinnamon, scarcely tinged with olivaceous, subferruginous on umbo when dry, *beautifully silky-shining,* glabrescent. FLESH thin except on disk, concolor when moist, pallid when dry. GILLS adnate, becoming emarginate, subventricose, medium broad, close to somewhat subdistant, *at first pallid with tinge of fawn-color,* then pale cinnamon-umber, edge even. STEM 5-9 cm. long, tapering upward from a subclavate base or almost equal, 5-8 mm. thick above, pale brownish, paler above, *subannulate or with thin, concentric, fawn-colored zones from the universal veil,* sometimes abruptly pointed below, stuffed. SPORES 7-8.5 x 5-6 micr., broadly elliptical, slightly rough, obtuse.

Among mosses and debris of a sphagnum swamp. Gregarious. Chelsea (near Ann Arbor), Michigan. September. Rare.

Differs from the similar species in the Dermocybe group, of which *C. cinnamomeus* is the center, in its hygrophanous flesh, lack of yellowish gills and habit, as well as by the presence of the universal veil. In this last respect it approaches *C. sublanatus* Fr. and *C. valgus* Fr. (sense of Cooke), but is much more slender. The umbo is very obtuse and well-developed from the first, and the gills are not yellow nor saffron at any stage.

425. Cortinarius paludosus Pk.

N. Y. State Mus. Rep. 43, 1890.

"PILEUS 2-4 cm. broad, conical or convex, *ferruginous when moist,* buff-yellow or pale ochraceous when dry, hygrophanous. FLESH yellowish. GILLS broad, subdistant, adnate, saffron-yellow. STEM 5-8 cm. long, about 4 mm. thick, equal, long, flexuous,

solid, *peronate and sub-annulate by the fibrillose yellow universal veil.* SPORES 7.5-9 x 5 micr.

"Mossy ground in swamps, New York. August."

Section III. Universal veil white or whitish.

**Gills at first yellowish or pallid-ochraceous.*

426. Cortinarius hinnuleus Fr.

Epicrisis, 1836.

Illustrations: Cooke, Ill., Pl. 805.
Gillet, Champignons de France, No. 227.
Patouillard, Tab. Analyt., No. 648.
Ricken, Die Blätterpilze, Pl. 48, Fig. 3.

PILEUS 3-6 cm. broad, campanulate at first, then expanded and recurved, subumbonate, *rusty-ochraceous or yellowish tawny,* variegated with rusty stains in age, very *hygrophanous,* paler when dry, glabrous. FLESH thin, watery-soft, fragile when fresh. GILLS adnate-emarginate, *broad,* subdistant, pale yellowish-fulvous at first, stained rusty in age, edge minutely lacerate. STEM 5-7 cm. long, 4-7 mm. thick, rather slender, unequal, *soft and fragile,* easily split longitudinally, stuffed, *curved,* yellowish-pallid becoming dingy, glabrescent, *cingulate when fresh by a white zone* about the middle. SPORES broadly elliptical, scarcely rough, 7-9.5 x 5-6 micr. BASIDIA 30 x 7 micr., 4-spored. ODOR none.

On the ground among decayed debris, in beech and pine woods. New Richmond. September. Infrequent.

This plant seems to be very close to the European one, but differs in some minor particulars. It is more yellowish on the pileus, quite fragile and the gills are less broad and distant. It is placed here provisionally. At maturity the watery-rusty stains on the cap give it a spotted appearance; its flesh is thin and at length splits radially. The stem is variously thickened or almost equal, soft and usually curved. The white band-like zone on the stem at length disappears.

427. Cortinarius castaneoides Pk.

N. Y. State Cab. Rep. 23, 1872.

Illustration: Ibid, Pl. 4, Fig. 10-15.

PILEUS 1-2 cm. broad, campanulate-convex, then expanded, *chestnut-brown to dark watery-cinnamon,* brownish-ochraceous when dry, subumbonate and usually darker on center, *hygrophanous,* scarcely silky with a few superficial fibrils, even, margin sometimes whitish from the veil. FLESH *thin,* watery-brownish then pallid. GILLS adnate then emarginate, *rather broad,* subdistant, yellowish at first, then yellowish-cinnamon to dark cinnamon, edge almost entire. STEM 2-5 cm. long, 1.5-3 mm. thick, equal, slender, stuffed then hollow, subflexuous, pallid, *annulate from the cortina and the fugacious universal veil which remains as subannular, delicate shreds on the stem below.* SPORES elliptical, smooth, 6-7.5 x 3.5-4.5 micr. ODOR and TASTE none.

Gregarious or subcaespitose. On the ground in low frondose or conifer woods or in mossy places. Ann Arbor, New Richmond, Marquette, etc. August-October. Infrequent.

This has the stature and spores of *C. subflexipes* Pk., but the pileus is more convex, and the gills and stem not at first with any violet tint. *C. badius* Pk. is also of about the same size, but its spores are almost twice as large as those of *C. castaneoides.* These three approach the slender species of the subgenus Hydrocybe, and cannot always be distinguished easily from that group, especially where the annulus or other evidence of the universal veil have disappeared. *C. decipiens* Fr. differs in its conic pileus, different spore-size and the tint of rufous present on the stem.

428. Cortinarius badius Pk.

N. Y. State Mus. Rep. 41, 1888.

Illustration: Plate LXXXVII of this Report.

"PILEUS 1-2.5 cm. broad, varying conical to campanulate-convex, umbonate, *hygrophanous, blackish-chestnut-color when moist,* bay-red or chestnut when dry, sometimes tinged gray, the umbo darker, usually whitish-silky on the margin when young. FLESH concolor when moist, thin. GILLS *broad,* subdistant, ventricose, adnexed, *at first yellowish or cream-color,* then subochraceous. STEM 2-4 cm.

long, about 2 mm. thick, slender, equal, hollow, *silky-fibrillose and subannulate by the whitish veil, concolor within and without.*" SPORES large, broadly elliptical, 11-12.5 x 6.5-7.5 micr., scarcely rough.

"Mossy ground. Catskill Mountains, New York. September.

"The species is related to *C. nigrellus,* from which it differs in its broad gills which are paler in the young plant and in its larger spores." The Michigan collections formerly referred here differ somewhat and are described below, the gills are at first whitish or pallid.

***Gills at first whitish or pallid.*

429. Cortinarius iliopodius Fr.

Syst. Myc., 1821.

Illustration: Cooke, Ill., Pl. 839 (form).

PILEUS 2-3 cm. broad, campanulate-subexpanded, mammillate, hygrophanous, *sorghum-brown* (Ridg.), *with blackish umbo when moist,* avellanus (Ridg.) when dry, and then canescent-fibrillose and silky shining, margin at first incurved and white-silky from the veil. FLESH brownish (moist), thin, scissile. GILLS *pallid at first* then cinnamon (Ridg.), adnate, rounded behind, ventricose, *rather broad,* thin, close to subdistant. STEM *slender,* elongated, 5-9 cm. long, 3-4 mm. thick, *equal,* stuffed, at length flexuous, decorated by the delicate white silky remnants of the veil, pale incarnate, *fuscescent,* fuscous-brown or ochraceous toward base within, cortex subcartilaginous. SPORES elliptical-almond shaped, slightly rough, 10-12 x 5-6.5 micr., pale yellowish-cinnamon. ODOR and TASTE mild.

Scattered-gregarious on sphagnum swamp of spruce and tamarack. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Infrequent.

It soon fades to the colors of *C. paleaceus,* with a slight drab tint. It differs from *C. paleaceus* in its scattered mode of growth, in its sphagnum habitat and especially in its large spores. In shape and size it imitates *C. decipiens,* but is usually more slender. The species as conceived by Fries is evidently very variable and the plant described above is a definite form. In Monographia, Fries speaks of the yellow flesh of the interior of the stem. In Systema, he says the stem is occasionally fuscous, lilaceous, etc. In the plates at the

Stockholm Museum there is a "rubellus" tint to the stem and gills but otherwise the figures would represent the Adirondack specimens well.

430. Cortinarius badius Pk. var.

Differs from the type in the *gills becoming at first whitish,* stem whitish, pileus watery cinnamon to bay-brown when moist, fading *to ochraceous or pale tan, obtuse.* The spores measure 10-12 x 6-7 micr., elliptical, scarcely rough, cinnamon-brown in mass.

On mossy ground, frondose woods. Ann Arbor. May and October. Infrequent.

This little plant approaches *C. badius* quite closely in the size of the spores, and by neglecting the colors, was formerly referred to it. It needs further study. *C. punctata* Fr. (sense of Ricken) differs in its darker-colored stem and gills.

431. Cortinarius impolitus sp. nov.

PILEUS 8-20 mm. broad, *small,* firm, conic-campanulate then expanded, obsoletely umbonate, obtuse, *minutely fibrillose-scaly,* fibrils often dense at first, *hygrophanous, umber to chestnut-cinnamon at first,* becoming pale fawn or sometimes rufous-ochraceous, silky on the decurved margin, even. FLESH thin, concolor. GILLS adnate, *relatively broad,* sub-distant, thickish, *at first whitish or pallid* then cinnamon, edge entire. STEM 2-2.5 cm. long, 1-3 mm. thick, slender, equal, stuffed, *brownish or fuscescent, annulate about the middle* by a floccose, subpersistent, whitish ring, silky fibrillose, *cortina* dingy whitish. SPORES narrow subfusiform, subacute at ends, 9-10 x 4-4.5 micr., smooth. BASIDIA 27 x 7 micr. ODOR and TASTE none.

Gregarious or subcaespitose. On sandy soil among mosses in low, moist places in white pine and beech woods. New Richmond. September-October. Rather frequent locally.

A small species, marked by the median, subpersistent annulus, the dense, minute fibrils on the pileus and by the color and the spores. The annulus may appear below the middle or rarely be absent altogether; in the latter case faint whitish zones mark the stem. It seems to be partial to sandy regions.

****Gills at first brownish or fuscous.*

432. Cortinarius brunneofulvus Fr.

Epicrisis, 1836-38.

Illustration: Ricken, Die Blätterpilze, Pl. 50, Fig. 4 (as *C. brunneus* Fr.).

PILEUS 3-7 cm. broad, convex, hygrophanous, *dark watery-brown,* glabrous, even, subvirgate on drying, *margin white from the veil,* decurved. FLESH concolor when moist, thick on disk, scissile. GILLS adnate then sinuate, distinct, thickish, broad, subdistant, *soon brown to dark umber-cinnamon.*. STEM 5-8 cm. long, 10-15 mm. thick, *narrower upwards* from a clavate or bulbous base, solid, brown, longitudinally streaked with paler fibrils, *annulate by a distinct whitish band at or below the middle,* from the whitish, universal veil. SPORES elliptical, distinctly tuberculate, 10-12 x 6-7 micr. ODOR and TASTE slightly of radish.

Subcaespitose. On the ground in frondose woods. Ann Arbor. September. Infrequent.

This corresponds to Ricken's notion of *C. brunneus.* But according to specimens of *C. brunneus* collected by myself and others near Stockholm, that species has spores measuring 8-9 x 5-6 micr. and the universal veil is more nearly fuscous than white. It appears as if Ricken had interchanged the two species. In order to compare the two plants I give below the description of the Stockholm *C. brunneus* which is a common plant there. Fries says *C. bruneofulvous* has the stature of *E. evernius,* which does not apply as far as the stem of the latter is concerned. No violet tints are present in our plant.

433. Cortinarius brunneus Fr.

Syst. Myc., 1821.

"PILEUS 5-8 cm. broad, campanulate or somewhat obtusely conical at first, then *campanulate-expanded and broadly umbonate,* moist, hygrophanous, glabrous on center, *umber-brown when moist,* fulvous-alutaceous when dry, margin decurved and becoming innately fibrillose. FLESH umber when moist, fading, scissile, thin on margin. GILLS adnate, rather broad, distant to subdistant, thick, *dark livid-brown at first,* sometimes with an obscure purplish tinge then cinnamon-brown, edge entire and concolor. STEM 7-10 cm. long, 5-15 mm. thick, rather stout, firm, *umber or becoming fuscous* and innately streaked with paler fibrils, spongy-stuffed, *clavate-elongated to subequal, at times cingulate above by the* remains of the fuscous universal veil which fades in such a way that the annulus may become paler than the stem. CORTINA whitish, not copious. SPORES elliptical, almost smooth, 8-9 x 5-6 micr., (rarely up to 10 micr. long).

"On the ground among mosses in moist forests of pine and spruce. Stockholm, Sweden. Collected by C. H. Kauffman and confirmed by Romell. September, 1908."

It has somewhat the general appearance of *C. distans* Pk., but is much stouter and its larger gills are less distant, spores slightly longer and universal veil different. It is evident that European authors have confused different species under this name, and hence it seemed advisable to describe the plants from the collecting grounds of Fries. Other collections from Sweden have the same spores as mine. Cooke's figure (Ill., Pl. 868) illustrates the plant well when it is fresh, but his spore-size is wrong. Britzelmayr (Bot. Centralb., Vol. 51, p. 37) reports two species under this name, one of them with the spores in the sense of Cooke. Ricken has also described a different species as shown by the spores (Blätterpilze, p. 174). Quelet's figure (Grevillea, Pl. 113, Fig. 2) does not show the plant well either as to color or veil. Saccardo and Schroeter have given the spore-size approximately correct if we may assume that the Swedish plant is the proper starting point for a revision.

434. Cortinarius distans Pk.

N. Y. State Cab. Rep. 23, 1872.

Illustration: Plate LXXXVIII of this Report.

PILEUS 2-5 cm. broad, *campanulate,* sometimes obtusely conical at first, then campanulate-expanded, *umbonate,* minutely furfuraceous-scaly, *hygrophanous, watery-cinnamon to bay-brown when moist,* tawny or subferruginous when dry, margin usually deflexed, even, often splitting radially. FLESH thin, sordid, brown then dull yellowish. GILLS adnate, then sinuate, *distant, broad,* rigid, thick, *brownish or tawny-yellow at first,* then dark cinnamon. STEM 4-8 cm. long, 5-12 mm. thick, variously thickened to equal, *often attenuated below* and curved, stuffed, fibrillose, watery-brown

and unicolor when moist, the universal veil at first concolor but on breaking up leaving *a whitish, medium, somewhat persistent annular zone.* CORTINA whitish, fibrillose. SPORES oval, *rough-tuberculate,* 6-8 x 5-6 micr. ODOR sometimes slightly of radish. TASTE mild.

Gregarious or caespitose. On grassy ground in frondose woods. Houghton, Ann Arbor, Detroit, etc. July to September. Frequent.

This is one of the earliest summer Cortinarii, appearing preferably in low, grassy woods, about the time that *C. cinnabarinus* appears in the higher lying oak woods; it announces the fact that the Cortinarius season is open. It is somewhat difficult to see much difference in the formal descriptions between this and *C. brunneus* Fr., *C. brunneofulvous* Fr. and *C. glandicolor* Fr., but our plant has quite a distinct habit as compared with those. Its gills are truly distant while *C. brunneus* in spite of Fries' description, has more nearly subdistant gills, according to my use of those terms. *C. glandicolor* Fr. is a more slender-stemmed plant, according to Fries' unpublished plates, well shown also by Cooke (Ill., Pl. 789), although figured as rather stout by Ricken (Blätterpilze, Pl. 50, Fig. 3). Peck, in the original description, seems to have had specimens whose caps were "convex." All the specimens seen by me had a tendency toward the campanulate and umbonate form of pileus. The white zone at or below the middle of the stem is best seen in dry weather. The young stem is sometimes peronate. *C. furfurellus* Pk. is without doubt a synonym.

435. Cortinarius nigrellus Pk.

N. Y. State Mus. Rep. 26, 1874.

"PILEUS 2-5 cm. broad, at first conical, soon convex or expanded or subumbonate, minutely silky, hygrophanous, *blackish-chestnut when moist,* paler when dry. GILLS close, *narrow,* emarginate, *brownish-ochre at first,* then cinnamon. STEM 5-7 cm. long, 4-6 mm. thick, subequal, silky-fibrillose, pallid, often flexuous (slightly peronate by a rufous-tinged sheath in the dried type specimens). ANNULUS slight, evanescent." SPORES inequilateral, minute, smooth, 7 x 3.5 micr.

"Mossy ground in woods, New York. October. When moist the pileus has the color of boiled chestnuts, when dry of fresh chestnuts. The incurved margin of the young pileus is whitened by the veil. The gills are darkest when young. The taste is unpleasant, resembling that of *Armillaria mellea.*"

This is very close to *C. rigida* (sense of Ricken) in stature, colors and spores. *C. rigida* is, however, not uniformly described by European authors, especially as to its spore-size.

436. Cortinarius rigidus Fr. (var.)

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 791.
Quelet, in Grevillea, Vol. VII, Pl. 113, Fig. 4.

PILEUS 1-2.5 cm. broad, convex or conico-convex, umbonate or obtuse, *glabrous,* shining, *rufous-brown to chestnut when moist,* ochraceous to buff color when dry, hygrophanous, even and sometimes with white-silky margin, *elsewhere naked.* FLESH thin, rather firm. GILLS adnate then emarginate, rather close, moderately broad, ventricose, *rufous-cinnamon.* STEM 4-5 cm. long, 2-4 mm. thick, equal, flexuous, *fuscescent,* subfibrillose below the whitish, *median annulus,* apex pruinose. SPORES elliptical, smooth, 6-7.5 x 4 micr. ODOR somewhat fragrant, noticeable.

Gregarious or solitary. On the ground in frondose woods. Ann Arbor. September.

It is quite difficult to get any correct idea of this species from European notices. The spore-measurments per Saccardo are "6-11 x 4-6," per Ricken, "6-7 x 3" and according to others, intermediate in size. Our plants are more slender and less dark-colored than *C. nigrellus.* The species has the size of *C. paleaceus* but has a glabrous cap.

437. Cortinarius rigidus (Scop.) Ricken

Blätterpilze, 1912.

PILEUS 2-5 cm. broad, broadly campanulate-expanded, umbonate, firm and glabrous at first, hygrophanous, even, walnut-brown (Ridg.) when moist, *fawn-color on losing moisture,* soon hoary, silky-shining, margin at first incurved and white-silky. FLESH concolor, soon pallid, scissile. GILLS adnate, close, thin, moderately broad, at first pinkish-buff (Ridg.) then clay-color (Ridg.), edge paler. STEM 3-5 cm. long, 4-8 mm. thick, equal, stuffed, soon

hollowed by grubs, brownish within, *white-silky-fibrillose,* sometimes annulate from the white veil. SPORES *minute,* narrowly elliptical, 5-6.5 x 3-3.5 micr., smooth, pale clay-color in mass. ODOR and TASTE mild.

Gregarious or subcaespitose. On mosses under spruce, birch, etc. North Elba, Adirondack Mountains, New York. Collection Kauffman. Infrequent.

The typical Friesian species is said to have a marked odor and specimens from Sweden have larger spores. I have included it (in the sense of Ricken) for comparison. In shape and size it imitates *C. hemitrichus.*

438. Cortinarius hemitrichus Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 160, Fig. 2.
Cooke, Ill., Pl. 825.
Gillet, Champignons de France, No. 226.
Ricken, Die Blätterpilze, Pl. 49, Fig. 5.

PILEUS 2-5 cm. broad (rarely larger), campanulate, umbonate, sometimes umbo is obsolete, umbo varying acute or obtuse, *ground color umber, watery-cinnamon or fuscous when moist,* hygrophanous, *more or less canescent from the white, superficial, cirrate fibrils* which at first cover it, sometimes glabrescent in age, color fading to fuscous-gray or ochraceous-tan when dry, margin persistently white-silky. FLESH concolor, thin. GILLS adnate then emarginate, *broad,* close in front, *subdistant behind, at first brownish-gray* to subochraceous, at length dark cinnamon, edge erose-crenulate. STEM 3-6 cm. long, 2-5 mm. thick, equal, hollow, rigid, more or less *annulate at or below the middle* by the white, appressed ring, watery fuscous-brown within, fuscescent or brownish-fuscous without, fibrillose below the annulus. SPORES elliptical, smooth, 6-8 x 4-5 micr. (rarely 9 x 5.5). BASIDIA 30 x 7 micr., 4-spored. ODOR and TASTE mild.

Among mosses or debris in moist places or swampy woods. New Richmond. August-October. Not infrequent.

An extensive study of many specimens showed considerable variation and after some experience it was possible to distinguish two forms with respect to color. Both are conical when very small and become distinctly umbonate. Form (A) had a dark fuscous cap at first, umber when mature, fading to brownish-gray with a chestnut colored umbo; the gills were fuscous at first, and the annulus less fully developed. Form (B) had a watery cinnamon-brown cap when mature, fading to ochraceous-tan; the gills were pallid, ochraceous at first, and the annulus more persistent. The pileus of both had the characteristic villose covering, the same spores and habit. The gills of our specimens are never truly crowded, and in this respect differ from the European descriptions and from specimens which I collected in Sweden. The microscopic structure of both forms was alike. The upper surface of the fresh pileus is composed of a differentiated layer of two kinds of cells, one forming erect, fasciculate fibres alternating with a layer of larger cells; these fasciculate tufts of narrow cells arise from separate points in the surface of the pileus and produce the villose effect. This upper layer is easily dissolved by rains and often disappears leaving the pileus glabrous. The stem is usually hollow, but it is not rare to find a stuffed or solid axis. Both forms are caespitose. The variation in size is such, even in the same collections, that it is very doubtful whether *C. paleaceus* should be kept separate.

439. Cortinarius paleaceus Fr.

Epicrisis, 1836-38.

Illustrations: Fries, Icones, Pl. 106, Fig. 4.
Gillet, Champignons de France, No. 241.
Cooke, Ill., Pl. 826.
Plate LXXXIX of this Report.

Differing from *C. hemitrichus* Fr. in more slender habit, longer stem, the universal veil forming delicate, evanescent, subannular, white fibrillose zones along the stem, and in the pileus being more acutely conical. The colors are fuscous, paler.

In moist, mossy places in woods of oak, etc. Ann Arbor. September-October.

The spores, variability and habitat are the same as in the preceding from which it is separated with difficulty.

SUBGENUS HYDROCYBE. No universal veil. Pileus *hygrophanous,* glabrous or innately silky, changing color on losing moisture. Flesh quite thin, scissile. Stem rarely and then slightly subannulate from the remains of the cortina.

Composed of two sections: those with thicker caps whose margin

is at first incurved, and the smaller, slender species with submembranaceous pileus whose margin is at first straight on the stem in the manner of the genus Galera. They are distinguished from the Telamonias only by the absence of the universal veil although several have at times a slight annulus from the collapsing of the copious cortina and not from the outer veil. The pileus is never viscid; it is moist when growing but the moisture disappears quickly in sun and wind so that in our climate the dry, faded plant is more often found than the moist plant. However, for identification of most of the species of this subgenus it is absolutely necessary to know the colors of both the moist and dry pileus since in many of the species the pileii have a similar color when dry. I consider this the most difficult of the subgenera of Cortinarius both because of the great variability of the colors of most species, and because of the unsettled condition in which the European authors have so far left it. While at Stockholm, Sweden, I paid special attention to this group, and found a number of Friesian species; in many cases, however, these do not agree well with the spore characters as given by various authors. It is clear that only a temporary arrangement can be given of our species and it seemed best to put on record descriptions of such species as are close to the Friesian ones, as unnamed variations under the Friesian names. In Michigan the Hydrocybes seem to be much more numerous in the coniferous regions of the State than in frondose woods as appears to be also the case in Europe. I have no doubt we have quite a number of species which are truly American.

Section I. Margin of pileus at first incurved. Pileus thickish, of a medium or fairly large size. Stem somewhat stout.

**Stem or gills at first violaceous.*

440. Cortinarius imbutus Fr.

Epicrisis, 1836-38.

Illustration: Cooke, Ill., Pl. 870.

PILEUS 2.5-7 cm. broad, *convex* then expanded, obtuse or subumbonate, even, *hygrophanous, chestnut-brown when moist,* changing color, alutaceous or rufous-tinged on disk when dry and then becoming somewhat hoary, margin at first incurved and sometimes

decorated by whitish fibrillose scales from the cortina. FLESH thickish on disk, thin on margin, watery to pallid. GILLS adnate then subemarginate, *broad,* close, not crowded, *violaceous at first* with lavender tinge, soon cinnamon, edge concolor. STEM rather stout, 3-5 cm. long, 5-10 mm. thick, *equal* or nearly so, *solid,* at first violaceous, especially at apex, then silky-whitish and shining, violaceous within at apex, rarely subannulate from the whitish cortina. SPORES narrow, elliptical, smooth, 7-8.5 x 4-4.5 micr. BASIDIA 25-27 x 8 micr., 4-spored. ODOR none.

Gregarious or subcaespitose. On naked ground in low frondose woods. Ann Arbor. October. Infrequent.

This species is based here on the figures of Cooke and those of Fries' unpublished plate at Stockholm. The latter shows a pileus colored like ours and somewhat the same as that of Cooke's figures, but is not "gilvus" as described by Fries in his works. Cooke's figures do not show the violaceous character as do those of Fries. Other authors differ considerably in the application of this name and in the spore-size. The figure of Quelet (in Grevillea, Vol. VIII, Pl. 127, Fig. 2) is referred by Maire (Bull. d. l. Soc. Myc. de France, Vol. 26, p. 28), to *C. bicolor* Cke. and is not at all our plant. The cortina sometimes leaves a row of spot-like shreds on the margin of the pileus, sometimes it forms a slight annulus on the stem, but more often it is entirely evanescent. This species is near *C. castaneus,* from which it differs by its larger, stouter habit, its slightly smaller spores, but especially by the solid stem. Ricken considers it a variety of *C. subferruginea,* but he evidently had a plant with larger spores.

441. Cortinarius saturninus Fr. minor.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 161, Fig. 2.
Gillet, Champignons de France, No. 247.

PILEUS 3-6 cm. broad, campanulate, expanded, sometimes gibbous, glabrous, hygrophanous, pale watery brown when moist, ochraceous-gray-buff when dry, silky around margin. FLESH thin, scissile, violaceous then pallid. Gills adnate then emarginate, adnexed, *close,* moderately broad, *violaceous or tinged purplish at first* then ashy-cinnamon, thin, edge entire. STEM 4-6 cm. long, 6-12 mm. thick, subequal, slightly thicker downwards, terete or com-

pressed, *stuffed, violaceous above,* whitish below, fibrillose, glabrescent and shining when dry. CORTINA whitish. SPORES elliptical, slightly rough, 7-8 x 5-6 micr. ODOR and TASTE mild.

Subcaespitose. On the ground in frondose woods. Ann Arbor. September. Rare.

This is well illustrated by the figures of Fries and of Gillet. Ricken describes a plant with spores measuring 10-12 x 5-6 micr., and with a much darker pileus. The pileus soon fades. It is to be noted that although Fries describes the moist pileus as "dark bay" color, his figures are much paler. I have not seen it dark-colored and that character may belong to another species such as the one described by Ricken.

442. Cortinarius livor Fr.

Epicrisis, 1836-38.

PILEUS 3-4 cm. broad, firm, campanulate, obtuse, sometimes gibbous, *sooty-brown, obscurely olive-gray on center,* scarcely hygrophanous, *not fading,* even, innately subtomentose on disk, margin at first incurved. FLESH thickish on disk, sooty-brown under the center, pallid or whitish elsewhere. GILLS adnate then emarginate, close, relatively *broad, pallid-cinnamon at first.* STEM 4-5 cm. long, sub-equal, sometimes narrower at base, sometimes subbulbous, slightly *violaceous above,* becoming dingy olivaceous to brownish below, *solid,* firm, at first violaceous, within. SPORES broadly elliptical, slightly rough, obtuse, 7-8 x 5 micr. BASIDIA 30 x 7 micr., 4-spored. ODOR slight.

Solitary. On the ground in beech and pine woods. New Richmond. September. Rare.

There is an olive to sooty tinge on cap and base of stem, which along with the violaceous apex of the stem is quite characteristic. The plate of Fries at Stockholm, marked typical, shows a plant with a much shorter stem, otherwise our plant is very like it.

443. Cortinarius castaneus Fr.

Syst. Myc., 1821.

Illustration: Cooke, Ill., Pl. 842.

"PILEUS 2-5 cm. broad, firm, campanulate-convex, expanded or gibbous, even, *subumbonate,* scarcely hygrophanous, *dark chestnut color,* shining when dry, *hardly fading,* margin at first white-silky. FLESH thin, rigid-tough, concolor to pallid. GILLS adnexed, *not broad,* ventricose, *close, violet at first,* then rusty-cinnamon, *edge whitish.* STEM 2-4 cm. long, not truly slender, 4-6 mm. thick, cartilaginous, *stuffed then hollow, violaceous or pallid-rufescent,* silky from the white cortina. SPORES elliptical, rough, 7-9 x 4-5 micr. ODOR and TASTE slight."

Gregarious. On the ground in open woods, etc.

The description is adapted from the works of Fries and his unpublished plate at Stockholm. The characteristic features, by which it is separable from *C. imbutus* and other related species with violet gills, are the *hollow stem* and smaller stature. The figures of Cooke agree with those of Fries, except that they lack the markedly violet stem and gills. Patouillard's figures (Tab. Analyt., No. 128) remind one more of *C. badius* Pk., and Gillet's figure (Champignons de France, No. 202), has aberrant colors. Peck's specimens have the correct spores. The species has been reported by various authors in this country but I have not seen any typical specimens.

***Stem at first white or pallid.*

444. Cortinarius armeniacus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 793.
Ricken, Blätterpilze, Pl. 51, Fig. 4.

PILEUS 5-7 cm. broad, firm, campanulate-subexpanded, broadly *umbonate,* obtuse, glabrous, even, hygrophanous, *sudan-brown when moist* (Ridg.), orange-buff on umbo while drying, orange-buff or tan throughout when dry, margin when dry white silky from the cortina. FLESH thin on margin, scissile, soon pallid. GILLS adnate, emarginate, *broad,* ventricose, close, thin, *at first pallid,* then mars-yellow (Ridg.) to cinnamon, edge entire. STEM 5-7 cm. long, tapering upward, 5-8 mm. thick above, twice as thick below, watery-pallid when moist, dingy whitish when dry, *silky-fibrillose,* rind cartilaginous, stuffed, spongy at base. CORTINA whitish, sparse. SPORES elliptical, slightly rough, 8-9 x 5-5.5 micr. ODOR and TASTE mild or slightly of radish.

Gregarious. Among mosses under spruce and balsam. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914.

Similar in stature to *C. glabrellus,* but differs in the nature of the surface of the pileus both in color and in the structure of the cuticle. As the moisture disappears the umbo fades to pale ochraceous. It agrees well with the figures of Fries at the Stockholm Museum and also with the conception of Ricken. Fries states that the plants are more robust among fallen leaves and the stem is then stout and clavate-bulbous and some of his figures show this.

445. Cortinarius duracinus Fr. var.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 809 (not typical).
Ricken, Die Blätterpilze, Pl. 51, Fig. 2 (not typical).
Quelet, Grevillea, Vol. VII, Pl. 115, Fig. 1 (dry form).

PILEUS 4-10 cm. broad, *convex* then expanded, obtuse, sometimes gibbous, *hygrophanous, watery cinnamon-brown when moist,* tinged rufous on disk, pale ochraceous-tan to buff when dry, *glabrous,* even, margin at first incurved then geniculate and obsoletely silky. FLESH rigid-brittle, *thin,* scissile, concolor, at length pallid. GILLS adnate or slightly subdecurrent, thin, *subdistant,* moderately broad, pallid at first but *soon watery-cinnamon,* edge even or scarcely crenulate. STEM 4-12 cm. long, *tapering downwards or fusiform-subradicate,* 6-15 mm. thick, glabrous, rigid, stuffed then hollow, sometimes compressed, at length shining, *white,* at first cortinate-fibrillose. CORTINA white. SPORES elliptical-almond-shaped, scarcely rough, 7-9.5 x 5-5.5 micr. BASIDIA 32-36 x 8-9 micr. ODOR and TASTE mild.

Gregarious, often in troops or subcaespitose. On the ground, grassy places, etc., in frondose woods of southern Michigan. August to October. Frequent in very wet weather.

One of the larger Hydrocybes, usually found in quantity when it occurs. No good plates seem to exist of the plant as it occurs with us. Our specimens agree in stature, colors, spores, etc., with a collection I found at Stockholm. Ricken gives spores much larger, but Massee's spore-measurements are much smaller. It seems clear that the species of Fries is yet uncertain. A plant agreeing in the spore-character with that of Ricken and otherwise similar to the above species occurs with us in the same habitat. The rigid-brittle, convex pileus, the tapering-subradicating stem and the colors and size distinguish our *C. duracinus.* It has somewhat the appearance of *C. dolobratus* Fr. as figured by Cooke (Ill., Pl. 811) except in shape of stem and the brown color; furthermore the margin of the pileus of that species is at first incurved. Neither the pileus of our plant nor that occuring at Stockholm had a truly ferruginous or testaceous color when moist.

446. Cortinarius sp.

PILEUS 2-8 cm. broad, *conico-campanulate,* subexpanded, glabrous, even, hygrophanous, rufous-cinnamon when moist, *pale tan when dry* and subshining, margin white-silky at first. FLESH thin, scissile, at length whitish. GILLS adnate-emarginate, *broad,* broadest behind, tapering in front, medium close, ventricose, *pallid-brownish at first* then dark cinnamon, edge erose-crenulate, concolor. STEM 6-10 cm. long, 7-12 mm. thick above, *subbulbous to clavate below, stuffed,* soon cavernous, soft-spongy within, silky-fibrillose, *whitish to pallid.* CORTINA white. SPORES broadly elliptical, 8-9 x 5-6 micr., scarcely rough. ODOR and TASTE mild.

Gregarious to subcaespitose. On the ground in frondose woods, among grass, etc. Ann Arbor. September. Infrequent.

In size this species corresponds to the preceding, but differs in its somewhat cone-shaped, rather acute pileus, broad gills and bulbous to clavate stem. *C. candelaris* Fr. is half-way between the two in having a conic-campanulate pileus and a radicating stem and the spores, according to Ricken, measure 9-11 x 4-5 micr. Found in quantity, but all with clavate-bulbous stems. Specimens of *C. candelaris* from Bresadola had spores measuring 6-7.5 x 5 micr.

447. Cortinarius erugatus Fr.

Epicrisis, 1836-38.

PILEUS 3-6 cm. broad, campanulate-convex, obtuse to broadly subumbonate, *hygrophanous,* pale *umber-cinnamon to grayish-brown with rufous or fulvous umbo when moist,* on drying becoming pale reddish-gray with innate silky fibrils and *silvery sheen,* glabrous, even, margin at first incurved and entirely white-silky. FLESH thin, splitting on margin which is at length recurved. GILLS adnate-emarginate, rather broad behind, tapering in front, *close,* thin, *pallid-brownish at first,* then alutaceous to ferruginous, edge minutely erose-lacerate. STEM 4-7 cm. long (when elongated 8-10 cm.), 5-12 mm. thick, variable in length and thickness, *at first*

clavate-bulbous then elongated, soft-spongy, stuffed, *pallid and streaked with silky white fibrils,* becoming sordid, not cingulate. CORTINA white. SPORES elliptical, rather narrow, smooth, variable in length, 6-8.5 (rarely 9) x 4-4.5 micr. BASIDIA 30 x 6-7 micr., 4-spored. ODOR and TASTE mild.

Gregarious or scattered in thick leaf-mould of hemlock, pine and beech ravines. New Richmond. September-October. Infrequent.

When young the pileus is firm and very silky on edge, when old it becomes soft; the stem is early affected by grubs and soon decays at the base. The color of the pileus changes markedly and hence is very variable. Sections of very young buttons show no universal veil.

448. Cortinarius glabrellus Kauff.

Jour. of Mycology, Vol. 13, p. 35, 1907 (synopsis).

Illustration: Plate XC of this Report.

PILEUS 5-10 cm. broad, hemispherical-convex at first, campanulate-expanded, obtuse or *broadly umbonate,* glabrous, *hygrophanous, with a slight pellicle,* watery cinnamon when moist, *becoming brick-color on drying,* then paler, even, margin at first incurved and white-silky. FLESH concolor then pallid, rather thin. GILLS adnate, moderately broad, broadest behind, close, *distinct,* thin, *at first brownish-pallid* then cinnamon-brown. STEM 4-8 cm. long, 8-18 mm. thick, *varying equal* to subclavate below, rather stout and firm, straight or curved at base, *pallid or whitish,* silky-fibrillose and shining when dry, stuffed. CORTINA white. SPORES elliptical, 6-8.5 x 4-5 micr., smooth. ODOR and TASTE slightly of radish.

Gregarious. On ground in moist, low, frondose woods. Ann Arbor. September-October. Infrequent.

This species was originally referred to the subgenus Phlegmacium. The pellicle of the pileus is, however, scarcely gelatinous although the surface feels somewhat slippery. This and the reddish color which appears on the pileus as it loses moisture are the most striking characters.

449. Cortinarius privignus Fr. var.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 827 (pale, dry, small).
Ricken, Die Blatterpilze, Pl. 52, Fig. 2 (non Fr.).

PILEUS 4-6 cm. broad, gibbous, campanulate-convex, obtuse, hygrophanous, *fuscous-brown when moist, innately variegated-micaceous-silky,* paler and with tinge of drab when dry, glabrous, even, margin at first incurved at length splitting radially. FLESH thin except disk, concolor to pallid. GILLS adnate-emarginate, *rather broad,* ventricose, not crowded, *brownish at first,* then cinnamon, edge concolor. STEM 4-7 cm. long, 7-10 mm. thick, equal or subequal, sometimes *with a bulbous base, pallid with tinge of drab,* silky-shining when dry, glabrous, even, not cingulate, *stuffed then hollow.* SPORES broadly elliptical, obtuse, rough, 8-9 x 5-6 micr. ODOR and TASTE mild.

Solitary or gregarious. On the ground among humus in pine and beech woods. New Richmond. September-October. Infrequent.

The figures of this by Cooke and Ricken do not seem to apply to the same plant. Ours is intermediate between the two and fits more closely to the Friesian sense. The stem is usually clavate or even bulbous at base but equal elsewhere. The color of the pileus is soon similar to that of *C. paleaceus,* but the character of its surface is quite different and the plant is stouter.

450. Cortinarius subrigens sp. nov.

PILEUS 3-5 cm. broad, broadly *convex* from the first, then expanded-plane or subdepressed, *bay-brown* to chestnut and *variegated with white hoariness* when moist, fading quickly to cinnamon-rufous and then *hoary isabelline when dry,* hygrophanous, even, margin at first incurved and cortinate. FLESH rigid-brittle, thin, dingy pallid or brownish. GILLS sinuate-adnate, close, medium broad, *pallid to brownish* then cinnamon, edge entire and concolor. STEM 3-5 cm. long, equal or tapering downward, 5-10 mm. thick, rigid, base often curved, *stuffed then hollow,* at first cortinate-fibrillose, glabrescent and silky-shining, *pallid to white,* rarely subannulate from the white CORTINA. SPORES narrow-elliptical, subinequilateral, slightly rough, 9-10 x 4.5-5.5 micr. BASIDIA 30-32 x 6-7 micr. ODOR and TASTE mild.

Caespitose. On the ground in oak woods. Ann Arbor. October. Infrequent.

Known by its whitish stem, hoary silkiness on the pale chestnut-brown ground-color of the moist cap, the stuffed to hollow stem and its medium size. The stem and cap become firm and rather rigid when dry. When the stem tapers down it approaches *C. rigens* Fr. but the incurved margin of the convex pileus, its hoary-silkiness and more manifest cortina separate it. *C. scandeus* Fr. is distinguished by its smaller spores, conic to umbonate pileus and more slender stem. *C. leucopus* Fr. has a conic to umbonate pileus and different spores.

****Stem and gills becoming brown or fuscescent.*

451. Cortinarius rubricosus Fr. var.

Epicrisis, 1836-38.

PILEUS 3-7 cm. broad, convex-campanulate, broadly umbonate, *fuscous-bay-brown,* subhygrophanous, margin grayish, white-silky, at first incurved, elsewhere glabrous, even. FLESH thickish on disk, watery to pallid. GILLS adnexed-emarginate, *rather narrow,* close to subdistant, *soon umber-brown,* pallid-brownish at first, edge white-fimbriate. STEM 3-5 cm. long, 8-12 mm. thick above, rather stout, *clavate-bulbous,* 12-18 mm. thick toward base, firm, *solid,* grayish-pallid, *soon fuscescent,* at length dark fuscous umber below and within, at first densely white-fibrillose from cortina. SPORES broadly elliptical, rough-tuberculate, 8-10 x 6-7 micr. BASIDIA 40-45 x 9 micr., often with dark brownish content; *sterile cells* on edge of gills, slender, subclavate above.

Solitary or gregarious. On the ground among humus in hemlock woods. New Richmond. September. Infrequent.

This differs somewhat from the Friesian plants in its lack of reddish tints on the cap, and from the plant of Ricken in its larger spores. Britzelmayr gives the spores the same size as ours, and my collection from Sweden also has such spores but shows the slight rufous color when dry. It needs further study but surely belongs in its present position in the group.

452. Cortinarius uraceus Fr.

Epicrisis, 1826-38.

Illustration: Fries, Icones, Pl. 162, Fig. 3.

PILEUS 2-5 cm. broad, firm, at first ovate or campanulate then convex-subexpanded, often with a mammillate umbo, hygrophanous, *smoky chestnut brown* (Ridg.) *when moist,* even, fading to cinnamon-brown or isabelline, with blackish streaks, often *blackish on umbo,* margin persistently decurved. FLESH thin except disk, scissile, watery chestnut (moist), fragile when dry. GILLS broadly adnate, *broad,* close to subdistant, *dark watery brown at first,* then auburn to dark rusty-brown (Ridg.), edge at length black. STEM 4-9 cm. long, 4-10 mm. thick, equal or tapering slightly upward, becoming flexuous, *firm, stuffed then hollow,* pallid when fresh, soon brownish-streaked, *fuscescent, in age blackish,* rarely with narrow white evanescent annulus. CORTINA whitish, forming a silky zone on the young margin of pileus, fuscescent. SPORES broadly elliptical, 7-8 x 5-6 micr., rough. ODOR of radish when plants are crushed. TASTE mild.

Gregarious-subcaespitose. Among moss under balsam, spruce, etc. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Frequent after heavy rains.

The species is interpreted here in the sense of the Icones of Fries. It is well marked by its spores, dark colors and broad gills. In dry weather it is scarcely recognizable; it is then often pale tan and streaked with blackish stains, quite fragile and split on the margin of the cap. There is no universal veil in the young stage, the lack of which separates it from *C. glandicolor* which is nearest to it in color and habit. As characterized by Fries, an olivaceous color is sometimes present. This form appears to be that of Ricken with very large spores. In the Monographia, Fries himself raises the question whether it is not a composite species. Cooke (Ill., Pl. 796) figures a slender plant and it is possible that this is also a separate form, as I collected such a plant in Sweden with spores 8-10 x 5-6 micr.

453. Cortinarius juberinus Fr. var.

Epicrisis, 1836-38.

Illustration: Cooke, Ill., Pl. 797.

PILEUS 2-4 cm. broad, campanulate-convex, then expanded, umbonate or umbo obsolete, *chestnut-brown to watery cinnamon* when moist, ochraceous when dry, subhygrophanous, glabrous, even, *silky-shining when dry,* margin at first incurved and white-silky from the cortina. FLESH concolor, thin. GILLS adnate then subemarginate, *subdistant,* rather broad, thin, at length ventricose, pallid-brown then cinnamon, interspaces somewhat venose, edge concolor. STEM 3-7 cm. long, 3-5 mm. thick, moderately slender, equal or subequal, even, *stuffed then hollow,* pallid at first, then brownish or fuscescent, innately silky-fibrillose. CORTINA white, fugacious. SPORES 6.5-7.5 x 4.5-5 micr., broadly elliptic-oval, scarcely rough. BASIDIA 27-30 x 6-7 micr. ODOR and TASTE slight or none.

Solitary or scattered. On the ground near wet or springy places in woods or swamps. Ann Arbor, New Richmond. September. Infrequent.

Distinguished by the spores, subdistant gills, hollow stem and colors. The pileus does not become black-stained nor black-streaked in age as do some similar species of this subgenus. The color of the pileus is variable, sometimes approaching tawny-cinnamon, and its surface is silky-shining as in *C. cinnamomeus.* Our plant agrees better with the unpublished figures of Fries and those of Cooke, than with the description of Fries; in his description, Fries states that the pileus is very bright cinnamon-fulvous, but this is not shown in his figure. The habitat is also different. The spores agree with the size given by Cooke, and doubtless we have his species here.

454. Cortinarius præpallens Pk.

N. Y. State Bull. 2, 1887.

"PILEUS 1-4 cm. broad, subconical, then convex or expanded, glabrous, *hygrophanous, brown or chestnut color when moist,* pallid-ochraceous when dry. FLESH yellowish-white, thin. GILLS rounded behind or subemarginate, *crowded,* lanceolate, *reddish-umber* then fuscous-cinnamon. STEM 2-7 cm. long, 4-8 mm. thick, equal, subflexuous, fleshy fibrous, subsilky, *pallid or brownish.* SPORES subellipsoid, 7-10 x 6.5 micr.

"On bare ground in woods, New York."

Section II. Margin at first straight on the stem, Galera-like. Slender-stemmed, with the pileus mostly conical-campanulate and almost membranous.

**Stem or gills at first violaceous.*

455. Cortinarius fuscoviolaceus Pk.

N. Y. State Mus. Rep. 27, 1875.

"PILEUS 1-2 cm. broad, convex (?) umbonate, soon expanded and centrally depressed, *glabrous, hygrophanous, chestnut-brown tinged with violet,* the margin whitened by silky fibrils. GILLS rounded behind, at first plane then ventricose, rather distant, *dark violaceous at first* becoming subcinnamon. STEM 2.5-4 cm. long, *slender,* flexuous, equal, solid, silky-fibrillose, colored like pileus." SPORES broadly elliptical, minute, smooth, 6-7 x 3-4 micr.

"Sphagnous marshes, New York."

A very similar plant occurs at Ithaca, New York., with spores 7-10 x 3-4 micr. The type-specimens, however, show the spores as given above.

456. Cortinarius erythrinus Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 798, A.
Ricken, Blätterpilze, Pl. 53, Fig. 2.
Quelet, Grevillea, Pl. 115, Fig. 2.

PILEUS 1-2 cm. broad, rather firm, *conic-campanulate,* then subexpanded and subacutely umbonate, chestnut brown, *umbo umber or blackish,* paler toward margin, hygrophanous, glabrous, even, soon fading. FLESH thin on margin, scissile, watery-brown when moist. GILLS rounded behind and adnexed, *rather broad,* ventricose, close to subdistant, pallid or pale brownish then cinnamon, edge entire. STEM slender, 4-6 cm. long, 3-4 mm. thick, fragile, *equal,* flexuous, stuffed then hollow, *apex violet at first,* pale brownish elsewhere, sometimes violet-tinged throughout, sparsely cor-

tinate, glabrescent, shining when dry. SPORES short, elliptical, 7-9 x 5-6 micr., almost smooth, pale ochraceous. ODOR and TASTE mild.

Gregarious. On bare soil in mixed woods. North Elba, Adirondack Mountains, New York. Collection Kauffman. September, 1914. Infrequent.

The slender form of the species is illustrated by Cooke. It agrees in all respects with plants found in Sweden. The stouter forms approach *C. castaneus*.

***Stem white, pallid or dingy brownish.*

457. Cortinarius decipiens Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 798, B.
Ricken, Blätterpilze, Pl. 53, Fig. 8.

PILEUS 2-4 cm. broad, at first *conico-campanulate,* then subexpanded with decurved margin, *prominently umbonate,* vinaceous-cinnamon (Ridg.), *umbo blackish while losing moisture,* hygrophanous, *glabrous,* silky-shining, margin with white-silky fibrils. FLESH thin, concolor. GILLS adnate, then emarginate-uncinate, close, *rather broad,* at first pallid or cinnamon-buff, *at length mars-yellow* (Ridg.), edge white-crenulate at first. STEM slender, 7-10 cm. long, 4-7 mm. thick, scarcely incrassate downward, stuffed then hollow, becoming flexuous, fragile, *pallid to silky-shining,* glabrous, brownish within. SPORES narrowly elliptical, 7-9 x 4-4.5 micr., scarcely rough. ODOR and TASTE slightly of radish.

Gregarious or subcaespitose. North Elba, Adirondack Mountains, New York. On mosses, sphagnum, etc., in balsam and tamarack swamp. Infrequent.

This species is placed here in the sense of Ricken. I doubt whether it is the typical Swedish species which I collected near Stockholm; the stem of that was rubello-tinged, the gills were truly cinnamon and the spores measured 9-10 x 6 micr. Britzelmayr also gives the latter size. When young and moist the cap of our plants is chestnut-brown.

Var. *minor*. PILEUS 1-2 cm. broad, stem 2-3 cm. long, 2-3 mm. thick. GILLS tawny at first then mars-orange (Ridg.), thickish, edge entire. STEM short, sub-bulbillate at base, often tinged sub-

orange or reddish-orange by deposit of the spores. SPORES 7-9 x 5-5.5 micr. Under conifers, New York.

Both forms are known by the gills becoming mars-orange at maturity. Sometimes the silky fibrils on the margin of the cap are slightly rufous. No universal veil is present. The cortina is whitish.

458. Cortinarius leucopus Fr. (var.)

Syst. Myc., 1821.

Illustration: Cooke, Ill., Pl. 843.

PILEUS 1-3 cm. broad, conico-campanulate, at length expanded and umbonate, even, *glabrous,* roods-brown (Ridg.) when moist, *cinnamon-buff* (Ridg.) *when dry,* hygrophanous. GILLS adnate-sinuate, ventricose, not broad, subdistant, *pallid at first,* then ochraceous-tawny (Ridg.), edge entire. STEM 3-4 cm. long, 2-4 mm. thick, rather slender, *equal, silky-fibrillose or sometimes subcingulate* from the white cortina, stuffed to hollow, *white or pallid.* SPORES narrow, elliptic-oblong, scarcely rough, 7-8 x 3.5-4.5 micr. (rarely 9 micr.). ODOR none.

Gregarious or subcaespitose. On the ground or moss in pine and spruce woods. North Elba, New York, and New Richmond, Michigan. September-October. Infrequent.

This approaches *C. juberinus* Fr., but pileus is more acute, spores of a different shape and stem scarcely brownish. The spores agree with those given by Ricken and Britzelmayr, but the colors, habit and the occasionally cingulate stem are shown in Fries' unpublished plate. No form has been seen with a pure white stem as described by Fries. Cooke's figures show the faded condition. The moist young pileus is margined by the white silky remains of the cortina.

459. Cortinarius scandens Fr.

Epicrisis, 1836-38.

Illustrations: Cooke, Ill., Pl. 830 (dry condition).
Cooke, Ill., Pl. 845 (as *C. obtusus*).
Gillet, Champignons de France, No. 236 (as *C. obtusus*).
Fries, Icones, Pl. 163, Fig. 3 (as *C. obtusus*).

PILEUS 1-3 cm. broad, *rigid,* conico-campanulate, *then expanded-*

umbonate, glabrous, *watery rusty-fulvous at first when moist* and striatulate on margin, *soon* honey-colored or alutaceous to paler when dry, soon even, hygrophanous. FLESH thin, concolor. GILLS adnate, sometimes emarginate, *narrow,* close to subdistant, thin, *pallid-brown then cinnamon,* edge concolor. STEM 3-8 cm. long, 2-5 mm. thick, *tapering downward,* thickened above, *attenuated at the slender curved base,* flexuous, *soon rigid,* stuffed then hollow, fulvous (moist) pallid or white and shining when dry, scarcely fibrillose at the first by remains of the scanty white CORTINA. SPORES short-elliptical, *almost smooth,* 6-7.5 (rarely 8) x 4-5 micr. BASIDIA 25-30 x 6-7 micr. ODOR none or slight.

Solitary, scattered or subcaespitose in pairs. Among leaves and humus in frondose and conifer woods. Ann Arbor, New Richmond. September-October. Frequent in the late autumn.

It is very variable in color, and the gills are sometimes rather broad, while the spores are consistently small. The plants are often the shape and color of *C. obtusus* Fr. as illustrated by various authors, so that it seemed advisable to refer to these figures. It seems that *C. obtusus* Fr., of which I obtained several collections at Stockholm, differs mostly in its larger size, its quite broad gills and larger spores; these measure 9-10 x 5.5-6.5 micr. It is to be noted that the figures of Fries (Icones, Pl. 163, Fig. 1) of *C. scandens* can scarcely be the form referred to in his descriptions. In "Monographia" he says distinctly that the stem is "incrassate at apex, always attenuate at the base," while in the figures the stem is not attenuate. The colors of his figures also do not correspond with the descriptions. I have followed the idea of the description, as did Cooke, Ricken, Britzelmayr and others. We doubtless have forms of *C. obtusus* also, but they need further study. Fries' unpublished plate of *C. rigens* Fr. shows that species to differ from *C. scandens* in its larger, stouter habit and convex or gibbous pileus; its gills are not broad.

460. Cortinarius lignarius Pk.

N. Y. State Mus. Rep. 26, 1874.

Illustration: Plate XCI of this Report.

PILEUS .5-3 cm. broad, *conico-campanulate, subacutely umbonate,* hygrophanous, glabrous, *watery-cinnamon to chestnut-fulvous when moist,* not striate, fading to pale fulvous-tan, innately silky-shining, margin at first straight and soon naked. FLESH submembranaceous, concolor. GILLS adnate-seceding, *broad,* close, thin, *ochraceous-pallid at first* then somewhat rusty-brown. STEM 2-5 cm. long, rather slender, 2-3 mm. thick, equal, pallid or subrufous toward base, often curved at base, silky-fibrillose below, *subcingulate at or above the middle by silky-white remnants of the rather copious cortina,* at length tubular, base white-mycelioid. SPORES narrow-elliptical, smooth, 6.5-7 x 4-5 micr. BASIDIA 25 x 6 micr., 4-spored. ODOR none. TASTE slight.

Subcaespitose or solitary on very rotten wood, in coniferous or mixed woods. New Richmond. September. Infrequent.

Known by the very marked subacute umbo, reddish-fulvous pileus, the cingulate stem, spores and habitat. Peck placed it under the Telamonias, but although slight colored floccules are sometimes present on the edge of the annulus, there is no other indication of a universal veil. When fresh there is sometimes a fleeting tint of violaceous at the apex of the stem. Sometimes it grows on logs when these are far advanced in decay.

461. Cortinarius acutoides Pk.

N. Y. State Mus. Bull. 139, 1909.

Illustrations: Ibid, Plate X, Fig. 4-8.

"PILEUS 8-16 mm. broad, *conic or subcampanulate,* acutely umbonate, hygrophanous, not striate, *pale chestnut color at first,* floccose and margined by the fibrils of the cortina, *whitish and silky-fibrillose when dry.* GILLS adnexed, subdistant, ascending, *narrow,* yellowish-cinnamon. STEM 2.5-5 cm. long, 2-3 mm. thick, solid or with a small hollow tubule, *white,* then whitish. SPORES 8-10 x 6-7 micr., ellipsoid.

"Swamps. Massachusetts. October. Closely allied to *C. acutus,* from which it differs in the darker color of the young moist pileus and whiter color of the mature dry pileus, the white color of the young stem, the adnexed gills, and especially by the larger spores and absence of striae from the pileus."

****Stem yellowish or ochraceous.*

462. Cortinarius acutus Fr.

Syst. Myc., 1821.

Illustrations: Cooke, Ill., Pl. 845.
Quelet, in Grevillea, Vol. VII, Pl. 112, Fig. 5.
Engler and Prantl, Pflanzenfamilien, Part I, Sect. 1,** Fig. 118 A.

PILEUS 5-25 mm. broad, *conical* or conic-campanulate with acute umbo, *striate to the umbo* and watery rufous-cinnamon when moist, pale alutaceous when dry, hygrophanous, minutely silky, margin white-cortinate, glabrescent. FLESH submembranaceous, yellowish. GILLS adnate seceding, close or scarcely subdistant, thin, not broad, *pale ochraceous at first* then ochraceous-cinnamon, edge entire. STEM 4-8 cm. long, *slender,* 1-2 mm. thick, equal, flexuous, tubular, *yellowish at first* becoming paler, silky from the evanescent white cortina, glabrescent. SPORES elliptical, smooth, 7-9.5 x 5-5.5 micr.

In moist places, swamps, etc. September-October. Specimens from Massachusetts by G. E. Morris.

Distinguishable from the preceding two by the clearly striate pileus and yellowish stem when fresh and moist. It is easily mistaken for a Galera.

Inocybe Fr.

(From the Greek *is,* a fibre, and *kybe,* a head, referring to the silky-fibrillose covering of the pileus.)

Ochre-brown-spored. Pileus conical or campanulate at first, *innately silky, fibrillose or fibrillose-scaly;* the cuticle continuous to the stem in the form of a more or less evanescent, fibrillose cortina. Volva none. Gills and spores pale and sordid; *edge of gills provided with cystidia or saccate, sterile cells.*

Putrescent, mostly terrestrial, often with a characteristic odor. *Mostly small or medium-sized plants;* intermediate between Hebeloma and Cortinarius, lacking mostly the viscid pileus of the former, and the delicate, cobwebby cortina and the darker brown or rusty spores of the latter; formerly joined with the genus Hebeloma. They are usually omitted from the list of edible species on account of their mostly disagreeable odor and taste. Some

are known to be markedly poisonous, e. g., *I. infida* Pk., *I. infelix* Pk., *I. fibrosa* Bres., etc.

The PILEUS has a cuticle composed of radiating, *parallel* fibrils, which breaks up more or less during development and in age, so as to form minute radiating cracks (rimose), or still more so, to form fibrillose scales, which in some species become recurved (squarrose-scaly); in others, the surface fibrils remain more or less interwoven and do not become rimose; in a few species the cuticle is at first viscid. These different modes of adjustment of the fibrils form a basis for a division of the species into sections. The color of the cap is rarely bright, it is mostly of whitish, ochraceous, grayish or brownish shades; *I. frumentacea* and its variety *jurana,* have sometimes a beautiful vinaceous or purple color, and are well-marked by it. Others, like *I. pyriodora,* have a characteristic pinkish tint to the flesh as they grow older. In most cases, however, color-descriptions are apt to be confusing, as the shades of brown, fawn, gray, or ochraceous vary in the same species and the same plants. For a satisfactory study of this group, the interested student should attempt to make colored sketches of the species he finds, accompanied by spore and cystidia drawings. It is practically impossible to be sure of a species of this genus without the use of the microscope. The GILLS may be adnexed or almost free, occasionally entirely free; adnate to subdecurrent in a few species. The color of the mature gills is usually of a dull, sordid or pale fuscous, hard to describe, but characteristic for many of the species, so that one soon learns to distinguish an Inocybe by the tints of the gills. The color of the gills is very similar to that of the genus Hebeloma. However, it may vary in some species to brown, yellow or olivaceous shades, and in one species becomes dingy purplish. A few have been described with pale violet or blue gills when young, but usually the young gills are whitish. The STEM is fibrous, usually rather rigid at maturity, its surface varying from slightly silky to fibrillose or squarrose-scaly. In the last case the stem is somewhat peronate or sheathed by the remains of the fibrillose-scaly covering which was continuous in the young plant from cap to stem; such species belong to the "Squarrosae" section. The apex of the stem is usually mealy or scurfy. It may be stuffed and later hollow, but most species have a solid stem. Some species are well marked by the striking color of the lower part of the stem. The stem of *I. calamistrata* Fr. has a dark greenish-blue base. The base of the stem of *I. hirsuta* Lasch., is said to be bright green; this species has not been found with us. In *I. cincinnata* Fr., the apex of the

stem as well as the young gills are said to be dark violet. The FLESH is characterized in some species by changing to a reddish color in age, e. g., *I. pyriodora* Bres., *I. repanda* Bres., *I. trinii* Bres., *I. incarnata* Bres. and *I. bongardii* Weinn. Some of these have not been found here. The SPORES are of great importance in the diagnosis of species. They may be spiny, angular or smooth. For the convenience of the student, each *section* may therefore be divided into the rough-spored and the smooth-spored species. Some authors have gone so far as to suggest the use of this character to establish genera. In some species, however, the spores are scarcely angular, i. e., they are intermediate between the smooth and angular shapes; an example of this condition is *I. decipiens.* In two of our species, *I. calospora* and *I. asterospora,* the spores are spiny, i. e., the surface of the spores is covered with slender, rod-like tubercles producing a pretty effect when seen under the microscope. Even the smooth spores often vary sufficiently in size and shape so as to provide means for the identification of species. CYSTIDIA are present in many species on the sides and edge of the gills; they are usually ventricose-lanceolate, mostly obtuse and covered at the apex by crystal-like deposits. In other species the cystidia are lacking, and only the edge of the gills is provided with differentiated structures; these are inflated-rounded at the apex in the form of obclavate or saccate, *sterile cells,* somewhat longer than the basidia. Ricken has used the rough and smooth characters of the spores, and the presence or absence of cystidia in such a way as to group the species under three divisions: (a) those with rough spores; (b) those with smooth spores and cystidia and; (c) those with smooth spores and without true cystidia. I have preferred to retain the more natural Friesian arrangement, modified so as to use the spore character under the sections.

The species included below have been interpreted from the point of view of the eminent mycologist, Ab. Bresadola, who has revised the older conceptions, and cleared up the complicated mass of synonyms for the European forms. The recent work of Ricken, which is also based on Bresadola's opinions, has helped not a little to arrive at definite conclusions.

Key to the Species

(A) Spores angular, tubercular or spiny.
- (a) Pileus viscid, small, tawny-ochraceous. 493. *I. trechispora* Berk.
- (aa) Pileus not viscid.
  - (b) Pileus squarrose-scaly, fuscous to cinnamon.
    - (c) Spores spherical, with rod-like spines. 468. *I. calospora* Quel.
    - (cc) Spores subrectangular or wedge-shape in outline, irregular. 467. *I. leptophylla* Atk.
  - (bb) Pileus not squarrose-scaly.
    - (c) Pileus appressed fibrillose-scaly.
      - (d) Stem fulvous-tinged; pileus 3-6 cm. broad, umbo fulvous. 487. *I. repanda* Bres.
      - (dd) Stem whitish; pileus brownish-ochraceous, large; spores elongated-oblong in outline. 474. *I. decipientoides* Pk.
    - (cc) Pileus soon rimosely cracked, fibrillose or silky.
      - (d) Disk of pileus white and glabrous, pale grayish-lilac or grayish-drab on the margin. 485. *I. albodisca* Pk.
      - (dd) Disk not sharply marked in color.
        - (e) Pileus creamy-white or tinged ochraceous, large, 4-8 cm. 484. *I. fibrosa* Bres.
        - (ee) Pileus not whitish.
          - (f) Spores subglobose, with blunt spines; pileus brown or rufous-brown. 486. *I. asterospora* Quel.
          - (ff) Spores irregularly-angular; pileus dark fuscous-brown. 483. *I. radiata* Pk.

(AA) Spores smooth, (i. e., not angular, etc.).
- (a) Cystidia present on sides of gills.
  - (b) Stem squarrose-scaly or floccose-scaly; pileus brown, squarrose-scaly.
    - (c) Spores 10-13 micr. long; stem squarrose-scaly. 463. *I. hystrix* Fr.
  - (bb) Pileus not squarrose-scaly.
    - (c) Pileus fibrillose-scaly, rarely or not at all rimose.
      - (d) Spores elongated-subcylindrical, 11-18 x 4-6 micr.; pileus brown, umber, etc. 471. *I. lacera* Fr. 472. *I. infelix* Pk.
      - (dd) Spores not markedly elongated.
        - (e) Small plants; pileus 1-2.5 cm. broad, tawny-brown; stem tinged rufous-brown. 473. *I. flocculosa* Berk.
        - (ee) Larger; pileus 2-6 cm. broad.
          - (f) Flesh tinged reddish or pinkish in age; pileus whitish then sordid brownish-ochraceous; taste sweetish. 469. *I. pyriodora* Bres.
          - (ff) Flesh not changing to reddish.
            - (g) Pileus and mature gills smoky-brown; spores 7-8 x 5 micr. 470. *I. scaber* Fr.
            - (gg) Pileus dark brown or rufous-brown, umbo darker; stem faintly rufous-tinged; spores 8-10 x 5-5.5 micr. 477. *I. destricta* Fr.
    - (cc) Pileus at length rimose, fibrillose or subscaly. [See also (ccc).]
      - (d) Spores obscurely angular, or almost even; pileus large, whitish, 4-8 cm. broad. 484. *I. fibrosa* Bres.
      - (dd) Spores smooth; pileus not whitish.
        - (e) Pileus dark brown or rufous-brown with chestnut-brown umbo; stem rufous-tinged. 477. *I. destricta* Fr.
        - (ee) Pileus paler; stem not rufous-tinged.
          - (f) Gills, when young, pale violaceous; pileus grayish-buff; spores 8-10 x 5-6 micr. *I. violaceifolia* Pk.
          - (ff) Gills not violaceous; pileus fawn-color, almost chestnut-brown when young and cortinate, often appressed-scaly. 482. *I. eutheloides* Pk.

(ccc) Pileus neither scaly, nor rimose, but persistently silky or fibrillose.
(d) Pileus violaceous-lilac. 491. *I. lilacina* Pat.
(dd) Pileus some other color.
(e) Pileus small, 1-2.5 cm. broad.
(f) Pileus and stem white, glossy-shining. 490. *I. geophylla* Fr.
(ff) Pileus and slender stem rufous; in wet places. 492. *I. scabella* Fr. var. *rufa.*
(ee) Pileus larger, 2-6 cm. broad.
(f) Pileus whitish to straw-color or tinged ochraceous, woolly-fibrillose; stem white. 488. *I. sindonia* Fr.
(ff) Pileus ochraceous or ochraceous-yellow, fibrillose-subscaly; stem pale ochraceous in age. 489. *I. subochracea* Pk.
(aa) Cystidia lacking on sides of gills; edge of gills provided with sac-shaped sterile cells.
(b) Pileus when fresh squarrose-scaly or floccose-warty; stem sheathed by floccose or fibrillose scales.
(c) Gills purplish-red; pileus smoky-brown, stem blood-red within; mostly in gardens and greenhouses. (See 236. *Psalliota echinata.*)
(cc) Gills not red.
(d) Stem dark greenish-blue towards base; pileus coffee-brown to wood-brown. 465. *I. calamistrata* Fr.
(dd) Stem and pileus fulvous-yellowish or ochraceous; stem at length tubular. 466. *I. caesariata* Fr.
(bb) Pileus not squarrose-scaly.
(c) Pileus appressed-scaly.
(d) Pileus large, 3-8 cm., smoky-purple, tinged wine-color, broadly umbonate. 475. *I. frumentacea* (Fr.) Bres.
(dd) Pileus olivaceous-fulvous; gills at first olive or fawn-yellow; flesh citron-yellowish; cortinate; spores 10-11 x 5.5-6.5 micr. *I. dulcamera* Schw.
(cc) Pileus at length rimose, fibrillose or subglabrous.
(d) Pileus smoky-purple, vinaceous, conico-campanulate. 475. *I. frumentacea* Bres. var. *jurana* Pat.
(dd) Pileus not purplish.
(e) Pileus whitish, tawny, ochraceous or yellowish.
(f) Center of pileus covered with white hoary-silky fibrils, convex and obtuse. 481. *I. lanatodisca* sp. nov.
(ff) Not hoary-silky.
(g) Spores 9-12 x 5-6 micr.; pileus conic-campanulate, pheasant-yellow to ochraceous-tan, virgate. 478. *I. fastigiata* Bres.
(gg) Spores smaller.
(h) Pileus pale yellow to straw color, lutescent; stem lutescent. 480. *I. cookei* Bres.
(hh) Pileus ochraceous to tawny-yellowish, gibbous; stem irregularly clavate. 479. *I. curreyi* Berk.
(ee) Pileus some shade of brown.
(f) Pileus glabrous, sublubricous on umbo, sordid livid-brown, putrescent. 494. *I. glaber* sp. nov.
(ff) Pileus fibrillose-virgate and very rimose, brown; spores 7-9 x 5-6 micr. 476. *I. rimosa* Fr. (Sense of Ricken.)

Section I. Squarrosae. Pileus at first densely scaly or squarrose-scaly; stem concolor.

**Spores smooth.*

463. Inocybe hystrix Fr.

Epicrisis, 1836.

Illustrations: Fries, Icones, Pl. 106.
Cooke, Ill., Pl. 424.

PILEUS 2-5 cm. broad, convex-expanded, broadly umbonate, *clothed* with *dense wood-brown, pointed or squarrose scales,* not rimose, nor striate; flesh white. GILLS adnate, not broad, close, pallid-alutaceous then brown, edge white-floccose. STEM 4-8 cm. long, 3-6 mm. thick, equal or enlarged below, *peronate to above the middle by squarrose scales,* concolor. SPORES elliptic-ovate, inequilateral, 9-13 x 5-5.5 micr., *smooth,* brown. CYSTIDIA on sides and edge of gills, ventricose below, obtuse, 70-90 x 12-17 micr. ODOR none.

Scattered or solitary. On the ground in mixed woods of northern Michigan. Marquette, Ishpeming. August. Rare.

Known by the dense recurved scales on the stem and by the large spores.

465. Inocybe calamistrata Fr.

Syst. Myc., 1821.

Illustrations: Fries, Icones, Pl. 106.
Gillet, Champignons de France, No. 360.

PILEUS 1-4 cm. broad, campanulate-convex, obtuse, surface soon broken up into dense, coffee-brown, squarrose scales, not rimose; flesh thin, *tinged dilute reddish,* darker in age. GILLS adnate-seceding or becoming sinuate, *broad,* close, soon cinnamon, at length ferruginous-sprinkled, edge thickish, white-flocculose. STEM firm, 4-8 cm. long, 2-5 mm. thick, tapering upward, *smoky-greenish-blue below,* fuscous or tinged rufous-brown above, *clothed with recurved fibrillose scales,* at length merely fibrillose, solid. SPORES elliptic-oblong, subreniform, obtuse at ends, 10-12 x 5-6 micr., *smooth,* ferruginous-brown in mass. CYSTIDIA none. STERILE CELLS on

edge of gills obclavate, rounded-inflated above, about 30 x 12 micr. ODOR slight.

Scattered or subcaespitose. On the ground in low woods, throughout the State. Marquette, Houghton, Bay View, New Richmond, Detroit, Ann Arbor. July-September. Infrequent and never plentiful.

Known by the smoky-blue lower part of the stem. The flesh turns pinkish-red in young fresh specimens where cut. When old or dry the stem is almost black below.

466. Inocybe cæsariata Fr.

Epicrisis, 1836.

Illustrations: Fries, Icones, Pl. 109.
Ricken, Die Blätterpilze, Pl. 31, Fig. 4, 1911.

PILEUS 2-5 cm. broad, broadly convex and obtuse, *at first covered by dense, leather-yellow, ochre-yellowish or fulvous, tomentose-fibrillose or erect warts or scales,* becoming loosely fibrillose scaly, appressed fibrillose on margin, not rimose, margin incurved and at first connected with stem by a dingy-white or ochraceous fibrillose cortina. FLESH white or whitish, at length sub-ochraceous, *thick and compact on disk,* thin on margin. GILLS rounded-ascending behind, adnate-seceding or at length subdecurrent by tooth, rather broad, *ventricose,* dull ochraceous-yellowish then ferruginous-ochraceous or cinnamon, edge white-flocculose. STEM 1.5-4 cm long, 2-6 mm. thick, *usually rather stout and short,* equal, at first floccose-scaly below, usually densely floccose-fibrillose, *concolor,* apex flocculose-scurfy, *soon definitely tubular,* ochraceous-whitish within. SPORES short oblong, rounded-obtuse at both ends, subreniform, 8-10 x 5-6 micr., ochraceous-cinnamon in mass, *smooth.* CYSTIDIA none; *sterile cells* on edge of gills variable, from inflated-pyriform to flexuous-cylindrical. ODOR none. TASTE mild.

Gregarious, usually many individuals in favorable spots, as if sown. On the ground in moist places, naked soil or among short grass, near springs, lakes or water courses. Spring and autumn. Ann Arbor, New Richmond. Not infrequent locally.

A rather variable plant when found under different weather conditions. In the luxuriant state or when fresh the cuticle of the pileus is broken up into dense floccose warts the bases of which radiate and connect with one another by silky white fibres; after being exposed for some time to rain or wind, the scales become more appressed-fibrillose, straw color or paler. The color is well shown in Fries' figures, but the scales on the cap and stem are more highly developed at times, so that it should be referred to this section, to which Ricken also referred it. It is easily mistaken for a Cortinarius. *I. unicolor* Pk., *I. subtomentosa* Pk., *I. subdecurrens* E. & E. and *I. squamosodisca* Pk. are related to it.

***Spores tubercular-spiny.*

467. *Inocybe leptophylla Atk.

Amer. Jour. of Bot., Vol. V, p. 212, 1918.

PILEUS 1-4 cm. broad, convex-expanded, obtuse, *covered with dense, cinnamon or umber, squarrose or pointed scales,* fibrillose on margin; flesh thin, whitish. GILLS rounded behind, adnexed, broad, *ventricose,* pallid becoming ferruginous-cinnamon, *edge white-crenulate.* STEM 2-4 cm. long, 2-4 mm. thick, equal, solid, *floccose-fibrillose* to tomentose-scaly, concolor, paler within, apex pruinose. SPORES subrectangular in outline, almost twice as long as wide, varying in shape, *with scattered obtuse tubercles* which are wider at base, 7-11 x 5-7 micr., ferruginous-brown. CYSTIDIA lacking; sterile cells on edge of gills, short, rounded-obclavate.

Solitary or gregarious. On the ground, in coniferous woods, or in swamps. Bay View, New Richmond, Ann Arbor. June-September. Rare.

This is apparently one of the American forms of *I. lanuginosa* (Fr.) Bres., to which Peck referred his species in his monograph of the New York Inocybes. (N. Y. State Mus. Bull. 139, p. 51.) But this seems unwarranted in view of the spore-measurements of *I. lanuginosa* given by such authorities as Bresadola and Schroeter who agree that the spores of the European species are much larger, about 11-15 x 8-9 micr. Specimens from three widely different localities in Michigan and New York yielded the same, smaller-sized spores. Schroeter has described a similar species, *I. lanuginella,* of which the spores are given the same size as ours, but have "prominent angles;" this may be our plant.

* This species was reported as *I. entomospora,* (see Mich. Acad. Sci. Rep. 8, p. 26) but became a *nomen nuda* by the publication of the above name by Atkinson after this report was in press.

468. **Inocybe calospora** Quel.

Bresadola, Fungi Trid., 1881.

Illustrations: Ibid, Pl. 21.
Plate XCI of this Report.

PILEUS 1-3 cm. broad, conic-campanulate at first, then expanded, umbonate, fuscous-rufescent, fading to ochraceous, umbo darker, covered, except umbo, by loose or recurved fibrillose scales, margin fibrillose and paler; flesh thin, pale. GILLS adnexed to almost free, rather narrow, subventricose, pallid then pale fuscous-cinnamon, edge white-fimbriate. STEM 3-6 cm. long, 1.5-2.5 mm. thick, firm, rigid-elastic, subequal, stuffed then hollow, pale brown, rufescent, sprinkled with a delicate pruinosity, bulbillate. SPORES spherical or nearly so, 9-12 micr. diam. (incl. aculeae), *covered with cylindrical, blunt aculeae,* 2-3 micr. long. CYSTIDIA few or scattered on sides, numerous on edge of gills, subventricose, apex granulate, 40-55 x 8-12 micr. ODOR none.

Gregarious. On the ground in low frondose woods. Ann Arbor. June-September. Rather frequent locally.

This pretty little plant usually occurs in patches of about a dozen. There is a slight rufescent tinge developed as the plant dries. Our specimens had longer and more slender stems as a rule than those shown in Bresadola's figure. *I. rigidipes* Pk. is said to approach it, but to "differ in the tawny-gray color, slightly adnexed lamellae, solid flexuous stem and larger spores." N. Y. State Mus. Bull. 139, p. 59.

Section II. Lacerae. Cuticle of pileus appressed-scaly or fibrillosely-lacerate, not rimose. Stem pallid at first.

**Spores smooth.*

469. **Inocybe pyriodora** Fr.

Syst. Myc., 1821.

Illustrations: Gillet, Champignons de France, No. 368.
Bresadola, Fungi Trid., Vol. I, Pl. 52.
Patouillard, Tab. Analyt., No. 528.

PILEUS 3-5 cm. broad, campanulate then plane-expanded and *umbonate*, sometimes irregularly lobed on margin, whitish when young, *soon dingy ochraceous or pale fuscous-clay color,* at length here and there *faintly stained with pinkish-red,* at first silky-fibrillose, at length appressed fibrillose-scaly, radially split on margin in age. FLESH white at first, slowly pale red where cut, thick on disk. GILLS sinuate-adnexed, medium broad, close, whitish then sordid cinnamon, in age diluted with a rufous tinge, edge white-flocculose. STEM 4-7 cm. long, 4-10 mm. thick, subequal, at the very first white-cortinate, subfibrillose, apex furfuraceus, strict, subbulbous at base, white at first, becoming light-red in age, solid but soon cavernous from grubs. SPORES broadly elliptical, subreniform, smooth, 8-10.5 x 5-6 micr. CYSTIDIA rather abundant on sides and edge of gills, ventricose above the short pedicel, broadly cylindrical above, 45-55 x 12-18 micr. ODOR *sweet,* spicy or like bumble-bee honey, becoming disagreeable.

Gregarious. On the ground in frondose woods of oak, etc. Ann Arbor. August. Infrequent.

This Inocybe is well described by Bresadola, and can be recognized by its peculiar light-red stains, especially between the gills or where they have been removed by snails or slugs. On the cap this color-change is not very marked. The odor has been described as being like that of ripe pears or clove pinks, and is quite characteristic. Except that the pileus is usually fully expanded, Patouillard's figure shows the old stage, which is most often found. The gills are sometimes narrow instead of broad, as indicated by Bresadola.

470. **Inocybe scaber** Fr.

Syst. Myc., 1821.

Illustrations: Ricken, Die Blätterpilze, Pl. 30, Fig. 1, 1911.
Patouillard, Tab. Analyt., No. 539.
Gillet, Champignons de France, No. 375.

"PILEUS 5-8 cm. broad, conical-campanulate, at length plane and broadly umbonate, *pale smoky,* with smoky, almost overlapping, fibrillose scales, the disk olive-blackish, at times tesselated, at the very first with a white-woolly cortina on margin, *fleshy.* Gills pale clay-color, finally almost smoky, close, broad, ventricose, emarginate-adnate, seceding. STEM 5-8 cm. long, 7-10 mm. thick, solid, subequal, *stout,* pallid or streaked with reddish-brown, silky-fibrillose with a slightly pruinose apex. SPORES almond-shaped, small, 7-8 x 5 micr., *smooth.* CYSTIDIA on sides and edge of gills, flask-