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STUDIES IN
THE AGARICS OF DENMARK

BY

JAKOB E. LANGE

PART IX

TRICHOLOMA. LENTINUS. PANUS. NYCTALIS.

WITH ONE PLATE



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Studies in the Agarics of Denmark.

Part IX.

Tricholoma. Lentinus. Panus. Nyctalis.

By

Jakob E. Lange.

With one plate.

THE GENUS TRICHOLOMA.

Tricholoma is one of the best known genera among the agarics. Most of its species are large and conspicuous and many of them grow in rows or in troops — young and fully developed specimens together — so that all stages can be examined simultaneously (in contradistinction to such genera as e. g. *Pluteus*, in which generally only solitary specimens are met with). Not a few of the Tricholomas are also of culinary value and therefore attract more general attention, resulting in more detailed descriptions, better illustrations etc.

Not only are the majority of the species comparatively well known, but the delimitation of the genus is also unusually exact. The boundaryline between *Tricholoma* and *Clitocybe* is rather vague in places. More especially the group *Aggregata* (which — following Fries — I have placed in the genus *Clitocybe* (*Difformes*), but which other authors with almost equally good reason have transferred to *Tricholoma*) falls outside the strict conception of either genus. — The main point in such cases is not to find out the right place for the group in question, but rather to get all closely related species united within the group, not shifted about among different genera. Even Fries did not altogether avoid such mistakes. He placed *Agaricus conglobatus* in *Tricholoma* while referring *A. aggregatus* to *Clitocybe*;

and *A. stridulus* he made a *Collybia*, while *A. melaleucus* etc. went into *Tricholoma*.

For such reasons species which on account of their decurrent gills or their somewhat cartilaginous stem might be referred to *Clitocybe* and *Collybia* are here retained in *Tricholoma*. Thus *A. grammopodius* and *A. calathus* (with decurrent gills) are placed in *Tricholoma* on account of their close affinity with *T. melaleucum* and *T. sordidum* respectively. And although *T. persicolor*, *T. ionides* and some of the slender *T. melaleucum*-forms are somewhat Collybioid I retain them in *Tricholoma*, as they have no near relatives among the *Collybias*.

Another taxonomic problem is how to dispose of the Tricholomoid *Armillarias*. I am inclined to refer all of them to *Tricholoma* (like Ricken). *Armillaria* in the Friesian sense is a motley crowd of species having very little in common, save some sort of annulus. From a taxonomic point of view it will therefore be preferable to split up the entire genus and place the several species in *Pleurotus*, *Tricholoma* (in the vicinity of exannulate species of the same types) and in *Cortinarius*, reserving the name *Armillaria* for *A. mellea* and its nearest relatives. If this be done, *Armillaria cingulata* naturally will find its place in the *Tricholoma Myomyces*-group, *A. robusta* and its allies will be transferred to the neighbourhood of *T. striatum*, *flavo-brunneum* etc., to which the spuriously annulate *T. aurantium* forms a connecting link. And *A. constricta* will fit in fairly well with *T. leucocephalum* (which has the same type of spore).

But apart from these small revolutionary steps I have tried to keep as close as possible to the Friesian delimitation. Innovations, when not decided improvements, should certainly be avoided. Thus I do not follow post-Friesian authors in segregating new genera: *Rhodopaxillus*, *Lyophyllum* etc., based on slight spore-colour differences and other minutiae.

The microscopic investigations.

1) *Cystidia*. In the great majority of *Tricholomas* Cystidia are either totally absent or very inconspicuous. But there is one notable exception to this rule. In the subgenus *Melanoleuca* (Pat.) all (or almost all) forms have the edge of the gills set with cystidia of a very characteristic type: conical-subulate bodies, the apex of which is decorated with minute crystalloid spinelets (pointing back-

wards) which give to the cystidium a harpoonlike appearance. Only in a single case have I found them totally absent. Their taxonomic value is therefore very evident. Among the genuine *Tricholomas* *T. rutilans* is characterised by rather large, somewhat inflated cystidia; in most other species if the edge of the gill is not entirely homomorphous, the sterile cells are of a very trivial type: hairshaped or basidiiform.

2) *The spore.* In *Tricholoma* (as in the rest of the *Leucospori*) the spore generally has a very thin membrane. But while in most cases the surface is smooth — at least when observed without any staining and without the use of an immersion-lense — the species within certain stirpes have a minutely granulate or prickly spore-membrane. Here again the subgenus *Melanoleuca* is first to be mentioned. All the *species* of this group have comparatively large, very minutely granulate or punctate spores. But also various species within other groups are characterized by spores of a similar type, a fact which comes in very useful for the identification of species otherwise difficult to determine. Thus *T. leucocephalum* (in the sense of ROB. FRIES, KARSTEN, REA a. o.) is easily recognized by spores of this type (ROB. FRIES characterizes them somewhat exaggeratedly as almost hedgehog-like!) while the *T. leucocephalum* of RICKEN, with small subspheric spores, is something entirely different.

In examining the spores (especially when only low-power lenses can be used) considerable care should be taken to avoid wrongly describing spores as rough which in reality have a smooth membrane, but which to the superficial observer will appear punctate on account of their granulated content. Such mistakes can be avoided by using immersion-lenses; but even without such technical equipment the careful observer will generally be able to decide whether the spore-membrane is rough or not by seeking out individual spores in which the minute oildrops have been fused together into one big central one, and where consequently the spurious wartiness has disappeared.

The *form* of the spore varies from almost spherical to narrow ellipsoid; by far the most common type is the slightly oblique, subovate spore. In a good many cases the spore-membrane is so delicate, the contour of the central oildrop so distinct and conspicuous that the membrane is likely to be entirely overlooked by a not too careful observer, and the oildrop mistaken for the spore itself which will therefore be described as globose. If either the

upper or the lower part only be overlooked — as may also happen — the spore will be taken to be shorter than it really is. Faulty descriptions (especially by earlier authors) may be accounted for in this way.

The *size* of the spore varies considerably, but really large spores I have never met with. The largest spores on record are those of *T. sulphureum* and its allies, the *index* of which (σ : length \times breadth in μ) is about 50. The smallest of all are found in the *carneum*-stirpe (index 8 to 12); in the majority of species the index is about 20—40.

3) *The basidia* are very uniform, narrow clubshaped; their width generally equals the length of the spore. *Two-spored basidia* are extremely rare. I have only met with them once, in a species closely related to *T. Myomyces* which I have called *T. bisporigerum*. (According to BOUCHET (*Bull. Mycologique de France, tome 45* (1930) *T. (Armillaria) constrictum* also has 2-spored basidia; but in my specimens they are 4-spored).

4) *The texture of the cuticle*. Already Fries had a clear conception of the differences existing in the texture of the cuticle of the cap in *Tricholoma*. His taxonomic classification of the genus chiefly rests on these typical differences. (His main divisions are: the *viscid*, the *squamulose*, the *silky* etc.) But microscopical investigation affords a means of establishing more exact distinctions. Hitherto such investigations have been somewhat neglected; and I therefore consider it useful to enlarge a little on this subject, although I have not been able to examine all the species in this respect.

Two main types exist: the *fibrillose* cuticle and the *cellular* one (just as in *Pluteus*). But while in *Pluteus* the two types are about equally frequent, the cellular type is quite an exception in *Tricholoma* (I only know it from *T. cuneifolium*). The cuticle of this species is made up entirely of subspheric-angular cells, forming a parenchymatic or pavement-like tissue. (When seen under a lens the surface of the cap in such cases is slightly micaceous-granular.) — The rest of the species (those I have had the opportunity of investigating) are of the fibrillose type. The cuticle is made up of more or less septate, filiform hyphæ. But two main subtypes can be distinguished: the *completely interwoven* and the more or less *parallel-fibrillose* one.

In the *subparallel-fibrillose* cuticle (which is characteristic of

the Friesian divisions *Limacina* and *Genuina*) the hyphæ run more or less parallel (radially) and are often as it were agglutinated into fibres consisting of a number of fibrils. But in the *interwoven* cuticle (common to all the other Friesian divisions) the hyphæ — which generally are very thin (3—4 μ) — run in all directions, forming an irregular web or tissue, looser or denser in the various species. — The subparallel type can again be fairly distinctly segregated in two series. In *Genuina* the parallel, agglutinated hyphæ predominate; they are comparatively coarse (averaging more than 6 μ , often considerably more), multiseptate and straight, while irregularly interwoven hyphæ are comparatively scarce. In most of the *Limacina* the parallel hyphæ are less predominant, often more slender (less than 6 μ , often 4—5), and this woof of straight fibrils has a warp of numerous irregularly interwoven ones.

To ensure conformity I have made it a rule always to peel off the skin for microscopical preparation midway between the center and the edge of the cap. — Further details about the several species investigated by me can be gathered from the list below.

A. Cellularæ.

T. cuneifolium. Cuticle made up of subglobose-polyedric, about 20 μ broad cells.

B. Fibrillosæ.

1. With subparallel hyphæ.

a. The genuine-subparallel.

Tricholoma rutilans. Hyphæ subparallel, slightly interwoven, 6 $\frac{1}{2}$ —13 μ broad, with pale purplish-brown content.

T. vaccinum. H. subparallel, reddish brown, 6—15 μ (generally 9—11 μ) broad.

T. cingulatum. H. somewhat interwoven, comparatively slender, 4—7 $\frac{1}{2}$ μ broad, pale gray to hyaline.

T. Myomyces. H. subparallel, slightly interwoven, pale gray, 4—9 μ broad.

T. orirubens. H. subparallel, comparatively slender, 5—7 $\frac{1}{2}$ μ broad, brownish gray.

T. bisporigerum. H. subparallel, strongly septate, 9—11 μ broad, pale grayish.

T. terreum. H. subparallel, strongly septate, 8—12 μ broad, gray.

T. murinaceum. H. subparallel, 8—10 μ broad, pale grayish-brown.

b. The subparallel-interwoven.

T. imbricatum. H. subparallel-interwoven, 4—8 μ (gen. 5—7) light brown to brown.

T. ustale. H. somewhat wavy, slightly interwoven, scabrous, 4—6 μ broad.

- T. portentosum*. H. subparallel, 3—4 μ broad, hyaline to slightly grayish.
- T. portentosum* f. *leucoxantha*. H. rather straight, slightly interwoven, 3—4 μ broad.
- T. virgatum*. H. somewhat parallel, interwoven, $3\frac{1}{4}$ —6 μ , pale grayish.
2. With completely irregularly interwoven hyphæ.
- T. saponaceum* (pale yellow form). H. loosely interwoven, meandering, rather coarse (4—8 μ), almost hyaline.
- T. album*. H. interwoven, wavy, 4—6 μ , almost hyaline.
- T. guttatum*. H. interwoven, 3—5 μ broad.
- T. ionides*. H. wavy, 3—5 μ , brownish.
- T. sulphureum*. H. completely interwoven, 3—5 μ broad.
- T. sudum*. H. irregularly interwoven (occasionally somewhat parallel), 3—4 μ broad, almost hyaline, slightly grayish.
- T. panæolum*. H. interwoven, very thin, $2\frac{1}{4}$ — $4\frac{1}{2}$ μ , hyaline.
- T. personatum*. H. irregularly interwoven, very thin, $2\frac{1}{2}$ —3 μ , hyaline.
- T. nudum*. H. irregularly interwoven, very thin, 2— $3\frac{1}{2}$ μ .
- T. melaleucum* (small form). H. irregularly interwoven, $3\frac{1}{2}$ —5 μ , slightly brownish.

The taxonomic value of these microscopic features cannot be fully gauged until all the species have been examined. It is not improbable that *T. cuneifolium* will have to be removed altogether from *Tricholoma*.

Taxonomy.

With regard to the taxonomic arrangement of the several species in the genus *Tricholoma*, as here delimited, various views may be held. The more conservative way would be to uphold the Friesian groups altogether. But this is hardly possible, if a fairly natural taxonomy is to be attained. First of all the *Hygrophana* will not hold together; the majority of the species form a very natural group (here set apart in the subgenus *Melanoleuca* (which also includes some few species from other groups); and of the rest *T. sordidum* is very close to *T. nudum* and should be placed in its immediate neighbourhood. And of the other groups no. 3—6 (*Rigida*, *Sericella*, *Guttata* and *Spongiosa*) are so vaguely characterized that they are hardly worth upholding. *Limacina* and *Genuina* are much more distinct and natural groups which I am inclined to maintain with slight alterations. But the most satisfactory and convenient way to dispose of the species will be to arrange them in small groups or "stirpes" around the leading

types and to name the several stirpes after their type-species. The student who becomes familiar with these types (most of which are common) will have a good foundation for building up a more complete knowledge of the genus.

These *stirpes* will need no further characterisation than that given in the description of their central type.

The minor characters which I have found useful for the segregation of the species will be seen in the Key.

K E Y
 TO THE SPECIES OF THE GENUS TRICHOLOMA FIGURED IN
 "DANMARKS AGARICACEER".

I. EU-TRICHOLOMA

(Texture of the cuticle of the cap fibrillose.)

A. *Tricholoma Vera.*

(Gill's edge devoid of cuspidate, harpoonlike cystidia.)

a *Fibrosa*. Cuticle made up of subparallel hyphæ.

a. *Peronata*. Stem peronato-squamose with red or brown scales.

1. Stem with a membranaceous ring.

* Robust; cap fulvous-brown 1. *T. (Arm.) robustum.*

** Smaller; cap somewhat orange-fulvous 2. *T. (Arm.) focale.*

2. Stem ringless, orange-fulvous-scaly 3. *T. aurantium.*

b. *Nudipedes*. Stem not squamose-peronate.

1. *Limacina* (Fr.). Cap somewhat viscid (except no. 8).

* Colour somewhat rufous, gills becoming spotted with same colour.

† Stem sulphur-pale inside 4. *T. flavobrunneum.*

†† Stem whitish-pale inside.

o Robust, cap pallid incarnate-brown 5. *T. populinum.*

oo Less robust, cap dark-brown or chestnut.

§ Cap perfectly smooth 6. *T. ustale.*

§§ Cap minutely fibrillose-striate or imbricate.

) Cap viscid, minutely fibrillose-striate 7. *T. striatum.*

) Cap perfectly dry, becoming imbricate-scaly

8. *T. imbricatum.*

** Colour yellow, gray or white.

† Cap yellow or gray.

o Cap yellow.

§ Gills bright yellow; Cap smooth or subsquamose.

9. *T. equestre.*

§§ Gills whitish; Cap with innate, dark fibrils 10. *T. sejunctum.*

oo Cap blackish or gray.

§ Cap with radiating, blackish fibrils, centre almost

black 11. *T. portentosum*

- §§ Centre not blackish; fuscous fibrils less distinct, on whitish or sulphur ground 12. *T. portentosum* var.
- †† Cap whitish or white.
 - o Cap with a flush of olivaceous.
 - § Cap very minutely lined with pale fuscous fibrils. 13. *T. spermaticum* var.
 - §§ Cap almost smooth, somewhat conical 14. *T. spermaticum*.
 - oo Cap pure white or with a tinge of yellowish.
 - § Cap pure white; smell almost 0. 15. *T. Columbetta*.
 - §§ Cap somewhat ochre-yellowish in the middle; sweet-smelling 16. *T. resplendens*.
- 2. *Genuina* (Fr.). Cap felty-squamulose (innato-fibrillose in no. 27). Not viscid.
 - * *Xylophila*. Growing on stumps. Cap purplish-velutinous, gills yellow; Cystidia large 17. *T. rutilans*.
 - ** *Humicola*. Growing on the ground. Cystidia inconspicuous.
 - † Colours reddish-brown; gills becoming spotted with same colour.
 - o Cap lanuginoso-squamulose, stem almost glabrous. 18. *T. vaccinum*.
 - oo Cap subsquamulose; stem granulate . . 19. *T. psammopodum*. (Cuticle smooth at first, then broken up in squamules: vide no. 8).
 - †† Colours gray or whitish.
 - o Cap felty-squamulose, piloso-squarrose or almost glabrous.
 - § Cap some shade of gray.
 -) Cap piloso-squarrose, stem swollen below, grayish with dark punctiform granules above 20. *T. atrosquamosum*.
 -) Cap felty-squamulose, stem almost cylindrical, whitish.
 - Gills with age flushed with salmon-pink 21. *T. orirubens*.
 - Not so.
 - o Basidia 2-spored, cap gray 22. *T. bisporigerum*.
 - o Basidia 4-spored.
 - x Cap blackish, no trace of cortina or ring, edge not shaggy, only minutely pubescent 23. *T. terreum*.
 - xx Cap blackish to pale fuscous; stem annulate or edge shaggy fibrillose.
 -) Cap fuscous grayish; stem with a cottony ring above 24. *T. cingulatum*.
 -) Cap blackish to mouse-grayish, edge shaggy fibrillose; (no ring but often a fugacious cobweblike cortina) . 25. *T. Myomyces*.
 - §§ Cap whitish, almost glabrous. 26. *T. argyraceum*.
 - oo Cap streaked with minute, innate, gray fibrils (vide also no: 11) 27. *T. virgatum*.

- β Contexta. Cuticle made up of irregularly interwoven, entangled hyphæ¹⁾.
- a. *Guttata*. Cap whitish with pale brownish, droplike squamules; edge slightly tomentose 28. *T. guttatum*.
- b. *Glabrata*. Not so.
1. *Echinospora*. Spores rather large, verrucose-prickly.
(Cap white, gills crowded).
- * Stem with a narrow, free ring 29. *T. (Arm.) constrictum*.
- ** Stem ringless, slender, rooting 30. *T. leucocephalum*.
2. *Sublævispora*. Spores smaller or smooth to minutely punctate.
- * *Collybiari*. Small (cap rarely above 4 cm.); gills somewhat crowded.
- † Spores ovate or ellipsoid.
- o Cap dark violaceous-fuscous; gills sulphur-whitish..
31. *T. ionides*.
- oo Cap somewhat pinkish or fleshcoloured; gills white.
- § Subfasciculate; stem slender, tough 32. *T. persicolor*.
- §§ Solitary; stem short 33. *T. carneum*.
- † Spores subglobose, very minute; gills yellow.
- o Gills very narrow 34. *T. pseudo-Flammula*.
- oo Gills rather broad 35. *T. fallax*.
- ** *Carnosa*. Larger species.
- † Subsicca. Cap not truly hygrophanous.
- o Nigrescentes. Gills pale to dark gray, blackening.
- § Gills rather crowded; spores ellipsoid 36. *T. leucophæatum*.
- §§ Gills distant, thick; spores roundish .. 37. *T. crassifolium*.
- oo Gills whitish, pallid or coloured.
- § Macrospora. Spores large (9 μ or more). Gills very distant.
-) Whole plant sulphur-yellow 38. *T. sulphureum*.
-) Whole plant whitish (*T. inamoenum*).
- §§ Mesospora. Spores smaller.
-) Gills somewhat distant, thickish.
- Gills not becoming flushed with salmon-pinkish.
- o Robust, creamy white (occasionally blackening in spots) 39. *T. album*.
- oo Smaller, alutaceous, flushed with pale tan
40. *T. lascivum*.
- Gills becoming flushed with pinkish fleshcolour.
- o Gills gray; spores ovate 41. *T. sudum*.
- oo Gills whitish or pale sulphur.
- + Cap dull greenish or fuscous, stem with fuscous squamules or fibrils .. 42. *T. saponaceum*.
- ++ Cap and stem sulphur or whitish.

¹⁾ Some of the species have not been investigated in this respect and have been placed here from analogy. Vide the text.

- . Pale sulphur; stem somewhat swollen..
 - 43. *T. s. var. napipes.*
- .. White; stem not swollen, somewhat rooting 44. *T. s. var. cnista.*
-)) Gills crowded, thinner.
 - Vernal. Cap white, alutaceous or tan.
 - Large, milky white; gills not very narrow.
 - 45. *T. gambosum.*
 - Smaller, alutaceous to tan; gills very narrow
 - 46. *T. graveolens.*
 - Autumnal, coloured.
 - Spores 5—6 μ long. No trace of lilac or blue colours.
 - + Cap and gills dirt-gray (darker or paler).
 - 47. *T. panaeolum.*
 - ++ Whole plant some shade of gilvous-alutaceous 48. *T. geminum.*
 - Spores about 7 μ long.
 - + Whole plant alutaceous-fleshcolour; smell sweet, aromatic 49. *T. irinum.*
 - + Stem, cap or gills somewhat blue or violet; smell slight.
 - . Gills pallid. Stem somewhat scaly, flushed with blue 50. *T. personatum.*
 - .. Gills blue to pale lilac. Cap and stem somewhat violaceous 51. *T. nudum.*
- †† Hygrophana. Distinctly hygrophanous species.
 - o Whole plant somewhat lilac.
 - § Rather fleshy, somewhat clustered, soon becoming subfuscous 52. *T. sordidum.*
 - §§ Cap very thin-flesched, depressed; gills somewhat decurrent; not fuscescent 53. *T. Calathus.*
 - oo Whole plant watery dirt-brown 54. *T. putidum.*

B. Melanoleuca (Pat.).

(Gill's edge with cuspidate, harpoonlike cystidia; spores oval, rather large, minutely verrucose.)

- α Gills whitish (not becoming isabelline or pale gilvous).
 - a. Very large, soon becoming cyathiform.
 - 1. Stem tall with darker lines, Cap fuscous, Gills somewhat decurrent 55. *T. grammopodium.*
 - 2. Stem short, cap pale tan. Gills not decurrent 56. *T. brevipes* (Bres.).
 - b. Medium to small, not cyathiform.
 - 1. Stem slender (as long as or longer than diameter of cap).
 - * Small (3—4 cm.); cap pale gray 57. *T. humile* var.
 - ** Medium; cap fuscous.

- † Gills emarginate 58. *T. melaleucum*.
 †† Gills adnato-decurrent 59. *T. stridulum*.
 2. Stem short or rather short.
 * Fuscous; Stem very short, soon becoming dirt-brown
 inside 60. *T. brevipes* Fr.
 ** Dingy white, alutaceous or tin-gray.
 † Rather large (Cap averaging 8 cm.), slightly umbonate.
 o Cap (when young) horn-brownish, then ashy whitish.
 Stem slightly mealy above 61. *T. strictipes*.
 o Cap tin-gray. Stem not mealy above. 62. *T. s.* var.
 †† Medium to small, 4—8 cm., whitish-gray, umbo pro-
 minent 63. *T. excissum*.
 β Gills becoming more or less isabelline, ochry or gilvous (vide
 also no. 56).
 a. Cap very dark umber, stem short 64. *T. arcuatum*.
 b. Cap somewhat ochraceous or tan, stem slender 65. *T. cognatum*.

II. DERMOLOMA

(Cuticle of cap made up of subglobose-angular cells.)

- Small. Cap gray to fuscous. Odour mealy 66. *T. cuneifolium*.

SYSTEMATIC AND FLORISTIC NOTES.

I. EU-TRICHOLOMA.

A. TRICOLOMA VERA

α. FIBROSA

a. *Peronata*.

Stirpe 1: robustum.

1. **Tricholoma robustum** (Alb. & Schw.). (*Armillaria r.* Fries).

Diagnosis: Large and robust. Cap 7—9 cm., convex, innato-fibrillose-squamulose, somewhat cracked in the centre into coarse scales, brown, edge paler. Gills crowded, emarginate, almost free, white, edge subrufescent with age. Stem firm, attenuated downwards, fibrillose-squamulose peronate with light red squamules up to the membranaceous ring which is shaggy and whitish; apex white and granulate. Flesh white, firm, reddish under the cuticle, with a slight smell of cucumber, not bitter.

Spores ovate-ellipsoid or oval, $5 \times 3 \mu$. Cystidia 0.

Fig. specimens: ("Danmarks Agaricaceer", plate 60) Vissenbjerg, under *Pinus silvestris* in wood of *Picea*, Oct. 1905. Rare.

2. **T. focale** (Fr.) Rick. (*Armillaria*).

Diagn.: Medium. Cap 6—7 cm., plano-convex or slightly gibbose, coarsely fibrilloso-squamose, fulvous, edge paler and more reddish, at first appendiculate with remnants of the veil. Gills white, at last slightly rufescent, emarginate-free, crowded. Stem solid, somewhat attenuated downward with fulvous-red, fibrillose scales up to the shaggy ring, slightly granulate above. Flesh white, smell very slight, of cucumber.

Spores subspheric-oval, $4 \times 2\frac{1}{2} \mu$. Edge of gills with crowded, erect hairs.

Fig. spec.: (D. A. pl. 61) Ålsbo bakker, in wood of *Pinus* and *Picea*, Oct. 18. 1899. Rare.

(No. 1 and 2 evidently are very closely allied. If the gill's edge is naked in one and hairy in the other, and the size of the spore con-

stantly different there may be reason for upholding the two as species; but I have not had the opportunity of observing them in later years.)

3. *T. aurantium* (Schaeff.).

Diagn.: Large. Cap 5—10 cm., firm and hard, fulvous-orange, becoming brown from centre outward, scaly with innate, granulate squamules in the middle, viscid. Gills rather narrow, emarginate-free, soon becoming somewhat rufous. Stem stoutish, peronate-squamulose with numerous belts of scales, which are dirty fulvous below, bright fulvous-orange above, terminating in a ringlike zone, above which the stem is white. Flesh white, rubescent in the stem. Smell of cucumber or meal; taste bitter.

Spores subglobose-ovate, $4-4\frac{1}{2} \times 2\frac{1}{2}-3 \mu$ (or $5 \times 2\frac{1}{2}-3 \mu$ 1910). Cystidia 0.

Fig. spec. (D. A. pl. 62): Rønninge, wood of *Picea*, in a large circle, Sept. 24. 1902. Not uncommon.

(Generally more robust than shown in Fries' *Icones selectæ*.)

b. *Nudipedes*.

1. *Limacina*.

Stirpe 2: ustale.

4. *T. flavobrunneum* Fr.

Diagn.: Medium. Cap 5—8 cm., convexo-plane, somewhat umbonate, slightly viscid, more or less fibrilloso-squamulose, brown to maroon. Gills pale sulphur, becoming spotted with rufous-brown, rather crowded, almost free. Stem cylindric or attenuated downward, pale, but rufous-fibrillose all over, inside pale sulphur (while the flesh of the cap is whitish). Smell farinaceous.

Spores oval-globose, $5 \times 4 \mu$ (or subspheric-oval, $5\frac{1}{2} \times 3\frac{3}{4} \mu$).

Fig. spec. (D. A. pl. 68): Rold, in plantation of *Picea* with stumps of *Betula*, moist ground. Sept. 15. 1897. — Common on somewhat boggy ground under *Betula*. The gills become discoloured, as if scorched, with age.

5. *T. populinum* n. n. (*T. pessundatum* **stans* f. *campestris* Fr.).

Diagn.: Very large. Cap 8—12 cm., thickfleshed, convex or depressed, pale brownish with a slight tinge of flesh-colour, darker with age, edge paler, slightly viscid, almost smooth. Gills rather crowded, white, rufescent with age. Stem stout, rather short, whitish, becoming rufous-pallid. Subcæspitose. Smell very strong, of meal.

Spores ovate-oval, $5\frac{1}{2} \times 3\frac{1}{2} \mu$. Cystidia 0.

Fig. spec. (D. A. pl. 70): Hjallesø, under *Populus*, hedgerow, in grass, Oct. 1904. Not uncommon, always in the vicinity of *Populus* (*monilifera*, *canescens*, *tremula* etc.), in open, grassy places.

(I propose the new name *T. populinum* for this characteristic species because the existing names are too confusing. Probably the Friesian name *T. pessundatum* *stans, forma campestris covers my plant (*Icones sel.*). The typical *T. pessundatum* which together with the other form of *T. *stans* are said to grow "in pinetis" I have never met with. The name *pessundatum* should be reserved for these pinophilous forms.) — Rea (*Brit. Basid.*) gives the spore-dimensions for *T. stans* as $7-8 \times 5 \mu$, for *pessundatum* "globose, 5μ ". — Are there, in fact, a number of "small species"?

6. **T. ustale** Fr.

Diagn.: Medium. Cap 5—8 cm., convex or slightly umbonate, fulvous-brown, viscid, smooth. Gills rather crowded, whitish, dark rufescent with age. Stem comparatively slender, pale, becoming flushed with rufous from base upward, whitish inside. No farinaceous smell. Whole plant becoming dark, as if scorched, with age.

Spores subspheric-ovate or broadly ovate $5-5\frac{1}{2} \times 3\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 71): Tommerup, in dense wood of Fagus, Sept. 12. 1900. Common in beechwoods.

7. **T. striatum** (Schaeff.) Schroeter. (*T. albo-brunneum* (Pers.) Fr.).

Diagn.: Medium to rather small. Cap 5—6 cm., somewhat conical-convex or slightly umbonate, minutely lineato-striate, with innate fibrils, rufous-brown, viscid. Gills rather crowded, white, rufescent with age. Stem cylindrical, somewhat rufescent, darker below, somewhat squamulose above, inside whitish, not hollow. Smell very faint, of meal.

Spores ovate-ellipsoid, $5 \times 3 \mu$.

Fig. spec. (D. A. pl. 69): Håre Bjerge, drive in plantation of Pinus, sandy hill, Oct. 1906.

(The Persoonian name *T. albo-brunneum* is later and less characterizing.)

8. **T. imbricatum** Fr.

Diagn.: Medium. Cap 4—9 cm., dry, somewhat conical, dark fulvous-brown, smooth when in bud, with a strongly involute edge, but soon breaking up — from edge centreward — into somewhat imbricate, more or less coarse scales. Gills rather crowded, whitish, rufescent with age. Stem somewhat thickened downward and somewhat rooting, pale, brownish-rufescent with age, from base upward.

Spores sphaeric-obovate, $5-5\frac{1}{2} \times 3\frac{3}{4}-4 \mu$ (or $5\frac{1}{2}-6\frac{1}{4} \times 4-4\frac{1}{4} \mu$).

Fig. spec. (D. A. pl. 72): Høbbet, near Trolleborg, in wood of Pinus, Oct. 1900. — Not uncommon, always under Pinus.

(Easily distinguished from *T. vaccinum* by the originally smooth cap without a shaggy-woolly edge. The dry cuticle distinguishes it from all the preceding species, to which it in other respects is closely allied.)

Stirpe 3: equestre.

9. **T. equestre** (L.).

Diagn.: Rather large or medium. Cap fleshy, 4—9 cm., rather flat or difform, light yellow, slightly scaly and pale brownish in the middle, viscid. Gills rather crowded, almost free, sulphur-yellow. Stem stout, whitish to pale yellowish.

Fig. spec. (D. A. pl. 63): Rold, coniferous wood, in moss, Sept. 15. 1897.

Not uncommon in coniferous woods, chiefly under Pinus.

10. **T. sejunctum** (Sow.).

Diagn.: Rather large. Cap 6—9 cm., slightly viscid; the basic colour is a pale or somewhat brighter chrome-yellow; but from the almost fuscous umbo towards the edge the surface is partly covered by radiating, anastomosing, minute, subfuscous fibrils. Gills rather distant, very broad, white to slightly sulphur. Stem with indistinct, pallid-dingy spotlike scales above, cylindrical, rather stout whitish to pale sulphur. Smell faint (somewhat like *T. sulphureum*). Flesh with a bitterish after-taste.

Spores almost spheric, $5-5\frac{1}{2} \times 4-4\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 65): Lundsgård v. Kerteminde, in wood of Fagus, Sept. 1905; rather numerous. Rare.

11. **T. portentosum** Fr.

Diagn.: Large (Cap 7—10 cm.) but rather thin-fleshed; Substratum pallid, but almost totally covered by minute, fuscous, fibrils radiating from the nearly black centre. Viscid. Gills somewhat crowded, white or flushed with pale sulphur; broad, deeply emarginate. Stem stout, cylindric, white (or flushed with pale sulphur) often deeply rooted in the soil. Taste slight, not bitter.

Spores broadly oval, $5 \times 3\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 64): Kirkeby, wood of Picea, Oct. 5. 1897. Rather common, more especially in woods of Fagus with old Pinus-trees (or vice versa). — (With KILLERMANN I take *T. tumidum* (Barla, l. c. pl. 39) to be a form of *T. portentosum*).

12. **T. portentosum** var. *leucoxantha* Gill.

Diagn.: Differing from the main species by a somewhat paler cap, the fundamental colour of which in some parts is pale sulphur, in others whitish, thinly covered by very minute, radiating, subfuscous fibrils from the olive-fuscous centre outward. The stem is almost smooth, white or slightly flushed with sulphur. Taste slight, of meal, with a very faint ranky aftertaste.

Spores oval, $4\frac{1}{2}-5 \times 3\frac{1}{4}-3\frac{1}{2} \mu$.

Fig. spec. (D. A. supplement): Langesø, in wood of young Fagus

and old Pinus, a number of specimens (with the type), Oct. 15. 1932.

(But for the white, smooth stem, entirely devoid of fuscous fibrils or squamules, this form answers very well to the description of *T. fucatum* Fr. — The typical *T. f.* I have never met.) And BARLA's figure and description of *T. f.* evidently is a *T. sejunctum*. (Loc. cit. pl. 27).

13. *T. spermaticum* Fr. var.

Diagn.: Large. Cap 8—10 cm., viscid in wet weather, thin-fleshed, with an almost obsolete, somewhat conical umbo, expanded, pallid, dingy or olive-brownish (c 5—h 4)¹⁾, darkest in the middle (o 6—c 5), everywhere very minutely fibrillose (fibrils somewhat retiform towards the centre, lineate towards the edge which is almost white). Gills rather distant, very broad, rotundate-free, white, with a slight flush of pale sulphur. Stem cylindric, somewhat rooting, smooth, white with a flush of pale sulphur. Smell very faint (meal—cucumber); aftertaste slightly bitterish.

Spores broadly oval, $5\frac{1}{2}$ — $6\frac{1}{4}$ \times $4\ \mu$, often with numerous small oildrops.

Fig. spec. (D. A. suppl.): Næsbyhoved n. Odense, some few specimens in old wood of Fagus, Nov. 21. 1926. — Also at Langesø, Nov. 28. 1929.

Intermediate between *T. portentosum* v. *leucoxantha* and *T. spermaticum*.

14. *T. spermaticum* Fr.

Diagn.: Rather large. Cap 6—8 cm., thin-fleshy, slightled viscid, somewhat conical, when fully expanded with a conical umbo and deflected edge, whitish with a flush of olive-brownish or olive-greenish (slightly lineate when seen under a lens). Gills rather crowded, white, rather broad, deeply emarginate, edge slightly eroded. Stem cylindric, tall, somewhat fibrillose-striate, rooting, 9—14 cm. long. Smell faint, unpleasant, rank; taste slightly rancid.

Spores subspheric-ovate, punctate(?), 6 — $7 \times 4\frac{1}{2}$ — $5\ \mu$ (or $5\frac{3}{4}$ — $6\frac{3}{4} \times 4\frac{1}{2}$ — $5\ \mu$ with numerous small oildrops 1909).

Fig. spec. (D. A. pl. 66): A: Hesbjerg, wood of Fagus, Oct. 1897. B: Tøjstrup, wood of Fagus, Sept. 1909. — Rare.

(My specimens differ from the current descriptions by the rather conical, strongly umbonate cap).

15. *T. Columbetta* Fr.

Diagn.: Large. Cap 6—10 cm., subviscid towards the edge, at first convex, then expanded, pure white, smooth, becoming minutely

¹⁾ Referring to the colour-chart in Studies VI.

silky with innate fibrils, when old occasionally with violet spots. Gills rather crowded, white. Stem stout, cylindric, somewhat rooting, minutely fibrillose, firm. Almost without smell and taste (a very faint bitterish aftertaste).

Spores broadly oval, $6 \times 4\frac{1}{2} \mu$, with numerous small oildrops. ($5\frac{1}{4} \times 4 \mu$, with large central drop, 1929).

Fig. spec. (D. A. pl. 80): Gerup, wood near Høbbet (Fagus), rather numerous, Oct. 1916 (and 26). Also at Langesø, (under Fagus), Oct. 1926, and Hæsede (Gissfeldt), Oct. 1929.

Stirpe 4: *resplendens*.

16. **T. resplendens** Fr.

Diagn.: Medium. Cap 5—6 cm., convex, rather thin-fleshed, alutaceous-white, centre with a flush of ochraceous, viscid when wet (not shining when dry). Gills very crowded, thin, emarginate, pure white. Stem cylindric, base tapering, even, apex slightly flocculose, solid and firm, about 12 mm. thick. Taste mild. Smell agreeable, aromatic-sweetish (apricot, mushroom).

Spores oval-globose, $4\frac{1}{2} \times 3\frac{3}{4} \mu$. Cystidia 0. Basidia 4-spored.

Fig. spec. (D. A. pl. 67): Skydebjerg, plantation of *Picea*, Sept. 20, 1912 (a few specimens).

From young specimens of *Collybia maculata* it is easily distinguished by the sweet smell, the even stem and the constant colour. — It is not unlikely that this characteristic species — which has very little in common with the rest of the *Limacina* — should be transferred to the *constrictum*-stirpe. As long as the texture of the cuticle is unknown, this problem cannot be settled. — Ricken's *T. r.* does not belong here.

2. *Genuina* Fries (emend.).

* *Xylophila*.

Stirpe 5: *rutilans*.

17. **T. rutilans** (Schaeff.).

Diagn.: Medium to rather large. Cap 5—8 cm., basic colour chrome-yellow, partly or completely covered by a velutinous or plushlike tomentum of a deep purplish-crimson colour (which in old specimens in rainy weather may wear entirely away). Gills bright chrome-yellow, somewhat crowded, emarginate, edge minutely fimbriate and often of a deeper yellow colour. Stem paler than the cap, fibrilloso-floccose, cylindric.

Spores subspheric-ovate, $5-7 \times 4-4\frac{1}{2} \mu$. Cystidia inflated, large, vesiculose-clavate, about $90 \times 20 \mu$.

Fig. spec. (D. A. pl. 72): Rold, on stump of *Picea*, Sept. 13, 1897. Very common on coniferous stumps.

** *Humicola*.Stirpe 6: *vaccinum*.18. **T. *vaccinum*** (Pers.).

Diagn.: Medium to rather small. Cap 4—6 cm., convex, subumbonate, felty-squamulose, edge shaggy-woolly. Gills whitish, discolouring, rather crowded. Stem slender, fibrillose or somewhat squamulose, paler than the cap, hollow.

Spores subspheric-ovate, $5\frac{1}{2} \times 4 \mu$.

Fig. spec. (D. A. pl. 74): Rold, plantation of *Picea*, mossy ground, Sept. 17. 1897. — Not uncommon in coniferous woods.

19. **T. *psammopodum*** (Kalchbr.).

Diagn.: Rather small to medium. Cap convex, 3—6 cm., fibrillose, at last squamulose, pallid rufous tan. Gills with a flush of the same colour, rather distant, broad. Stem densely set with small granulate flocci of the same colour, base darker, apex whitish, smooth.

Spores subspheric-ovate, $5-6 \times 4-4\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 75): Kirkeby, wood of *Picea* with isolated *Larices*, Oct. 1914. — Strictly confined to the vicinity of *Larix*. (The figured specimens uncommonly small.)

Stirpe 7: *Myomyces*.20. **T. *atro-squamosum*** (Chév.) Konrad.

Diagn.: Rather large to medium. Cap 6—8 cm., plano-convex, with a woolly-shaggy or felty free edge, centre almost black, paler or even whitish towards the edge, with a plushy dark coating which in the middle forms erect hairy scales, while towards the edge it is reduced to adpressed fibrils. Gills almost free, truncate, edge somewhat eroded, grayish white. Stem somewhat conical, rather stout, grayish, more or less granulate above with blackish squamules, and minutely striate-fibrillose downward with fuscous fibrils. Smell slight, somewhat farinaceous.

Spores ovate-oval, $6\frac{1}{2} \times 4 \mu$ (or $6\frac{1}{2} \times 4\frac{1}{2} \mu$ 1922). Basidia 4-spored. Cystidia subfasciculate, but sparse, basidiiform, pale grayish. $30 \times 7-10 \mu$ (1930).

Fig. spec. (D. A. pl. 76): A: Lolland, Sept. 1920 (Leg. F. H. Møller). B: Tiselholt, wood of *Fagus*, in deep bed of dead foliage, in troops, Sept. 1922 (and later years).

RICKEN describes this species very well sub nom. *T. ramentaceum*; but *T. (Armillaria) ramentacea* in the Friesian sense is a distinctly annulate species from open grassy spaces. *T. squarrulosum* of BRESADOLA is almost identical, differing only from small specimens of my plant by the habitat (coniferous woods) and by somewhat larger spores (but Bresadola's spore-dimensions are often too large). REA applies the name *murinaceum* to it. But *murinaceum* is a very misused name which has been applied to all kinds

of agarics and had better be discarded altogether, while *atrosquamosum* is a very appropriate name. (KONRAD's description (loc. cit.) is very much to the point. However, I have never noticed the "aromatic" smell, and his figure does not show the characteristic erect, blackish scales on the top of the cap).

21. *T. orirubens* Quél.

Diagn.: Rather large to medium. Cap 5—8 cm., somewhat umbonate, when young dark gray, pallid towards the margin, somewhat tomentose, towards the centre densely set with small, blackish, hairy squamules, soon becoming dirt-brownish. Velum 0. Gills at first whitish, with or without vestiges of a blackish edging, with age becoming flushed with pale pink. Stem cylindric, white, rather tall, base slightly incrassated and often flushed with greenish-blue. Odour slight, mealy; aftertaste somewhat bitterish.

Spores oval-subspHERic, $4\frac{3}{4} \times 3\frac{3}{4} \mu$ (or $4\frac{1}{2} \times 3\frac{3}{4}$). Basidia 4-spored.

Fig. spec. (D. A. suppl.): Tiselholt, moist ground in wood of *Fagus* (rather numerous), Oct. 23. 1930. (And Åløkke, similar locality), Oct. 30. 1930.

When young this species bears a certain likeness to *T. virgatum* which, however, is more conical and very acrid. The pinkish colour is often very faint, but either the bluish base or the pinkish gills will generally characterize it. The mycelium is pale sulphur. — REA gives the dimensions of the spore as $8 \times 6 \mu$.

22. *T. bisporigerum* n. sp. (Plate 1, fig. c 1—4).

Diagn.: Rather small. Cap $3\frac{1}{2}$ cm., convex, rather fleshy, ash-gray, minutely felty and slightly squamulose, edge paler. Gills rather broad, emarginate, somewhat distant, slightly eroded, whitish. Stem cylindric, rather slender, $5\frac{1}{2}$ cm. \times 6—9 mm., white, minutely fibrillose. Almost devoid of taste and smell.

Spores broadly ovate, $6\frac{1}{2}$ —7 \times $4\frac{1}{2}$ — $4\frac{3}{4} \mu$. Basidia about 6μ broad with two very long (7μ) sterigmata.

Fig. spec. (D. A. suppl.): Langesø, wood of *Fagus*, in moss, on the southern shore of the lake, Oct. 22. 1932, (two specimens).

This little species has only been met with once and requires further study. It is the only 2-spored species within the genus known to me. It seems to be without a cortina, but I have not seen quite young specimens. I add a brief latin diagnosis.

T. bisporigerum n. sp.

Pileus $3\frac{1}{2}$ cm., convexus, cinereus, tomentos-subfloccosus, margine pallidiore, subtomentosus. Lamellis emarginatis, subdistantibus, albidis. Stipite elatus, cylindræus, albus, glabratus v. minute albofibrillosus. Basidia 2-sterigmatis.

Sporæ late ovatæ, $6\frac{1}{2}$ —7 \times $4\frac{1}{2}$ — $4\frac{3}{4} \mu$. In fagetis, locis muscosis.

23. *T. terreum* (Schaeff.) Bres.

Diagn.: Medium. Cap 5—7 cm., strongly convex or somewhat gibbose, comparatively fleshy, dark gray (centre blackish) densely covered with minute velutinous squamules, edge somewhat paler, involute, minutely pubescent (not woolly-fibrillose). Velum 0. Gills gray, slightly edged with black in places, rather broad. Stem whitish, firm, solid. Almost devoid of smell and taste.

Spores subspheric-oval, $5-6 \times 4-4\frac{1}{2} \mu$ (or $5\frac{3}{4}-6 \times 4\frac{3}{4} \mu$). Basidia 4-spored.

Fig. spec. (D. A. pl. 78 : Lundsgård, Kerteminde, wood of Fagus, a number of specimens, Sept. 1905. Rather uncommon.

This species — described and figured very well by BRESADOLA (*Ic. myc. pl. 75* — is clearly distinguished from dark forms of *T. Myomyces* by the slightly pubescent, not woolly-shaggy edge with no trace of a cortina. NÜESCH'S *T. t.* is a cortinate species (akin to *T. Myomyces-gausapatum*) while his *T. hordum* probably belongs here.

24. *T. cingulatum* (Fr.). (*Armillaria c.*).

Diagn.: Rather small to medium. Cap 4—6 cm., pale gray or dirt-brownish, squamuloso-fibrillose. Gills whitish, rather crowded, deeply emarginate. Stem slender, whitish, with a narrow, cottony, whitish ring above and slightly fibrillose-squamulose below.

Spores narrowly ovate, $4-5 \times 2\frac{1}{2}$ (1900); (ovate ellipsoid, $5-5\frac{1}{2} \times 3\frac{1}{4} \mu$, basidia 4-spored, 1932).

Fig. spec. (D. A. pl. 77 : Høbbet near Trolleborg in a highway-ditch, under *Salix cinerea*, Oct. 17. 1900, on moist ground. Not rare in similar localities, probably always in the vicinity of *Salices*.

25. *T. Myomyces* (Pers.) Lange.

Diagn.: Medium to small. Cap 3—7 cm., varying in colour from blackish gray to pallid, more or less densely clad with pilose squamules and tomentum, margin somewhat shaggy or woolly-fibrillose, often connected with the stem by a cobweb-like, very fugacious cortina. Gills grayish to pure white, somewhat distant. Stem whitish or pure white, often rather short.

Spores ovate, or ovate-ellipsoid, $6 \times 3\frac{3}{4} \mu$ (somewhat smaller in the figured specimens, $5 \times 3\frac{1}{2} \mu$).

Fig. spec. (D. A. pl. 79): Hjallese, frondose wood, in small troops, Oct. 11. 1896. Very common, often in large rows or circles in coniferous and frondose woods.

This very common little agaric is the bearer of quite a number of names, which various authors apply to diverse forms of the species. I do not see any real reason for upholding the majority of these "small species" which run completely into each other. The gills vary from gray to pure white, often tinged with chrome-yellow with age (like other allied species, e. g. *T. cingulatum*).

The form here figured (cortinate, dark gray) almost equals *T. gausapatum*. The form most commonly met with in coniferous plantations is often called *T. chrysites* or *T. argyraceum*.

KONRAD (loc. cit.) figures this form sub. nom. *T. scalpturatum* Fr. But. *A. scalpturatus* of Fries is an entirely different species (with a somewhat conical cap, covered with large scales of a rufous-brown colour).

Two of the extremest forms of the *T. Myomyces* group may deserve special mention and specific rank:

26.₁ *T. (M. var.) triste* Fr.

Diagn.: Small. Cap about 3 cm., with a prominent, conical umbo. Not figured. Ollerup, shrubby on naked, black soil, Oct. 1932.

26.₂ *T. (M. var.) *argyraceum* Fr. (sensu str.).

Diagn.: Rather large, but thin-fleshy (5—8 cm.), almost pure white, only in the middle sparsely set with fuscous fibrils and flocci. Not figured. Årup Kohave, wood of young beeches with stumps of *Picea*, Oct. 1930.

27. *T. virgatum* Fr.

Diagn.: Medium. Cap somewhat conical, gray, lineate with minute, radiating, darker fibrils. Gills pale gray, broad, with or without a black edging. Stem tall, rather slender, whitish. Flesh very bitter and acrid.

Spores subspheric-ovate, $6\frac{1}{2}$ — $7\frac{1}{2} \times 5$ — $5\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 87): Tommerup, wood of *Fagus*, Sept. 1900. Common, chiefly in beech-woods.

I refer this species to the *Myomyces*-tribe, although the virgate, not felty-squamulose cap brings it near to *T. portentosum* etc. with which it has also the slender cuticular hyphæ in common.

β. CONTEXTA.

a. *Guttata*.

Stirpe 8: *guttatum*.

28. *T. guttatum* Barla (nec al.). (Plate 1, fig. a 1—3).

Diagn.: Rather large. Cap 6—7 cm., convexo-plane, slightly gibbose; flesh rather thick, cuticle clay-brownish, darkest and even in the middle, disintegrated into small droplike innate squamules (on a whitish base) towards the edge, where it becomes hirtosquamulose and quite pale. Gills somewhat crowded, cream, emarginate and almost free. Stem rather short (5—6 cm.) and stout (1.3—1.6 cm.), slightly rooting, whitish-pale, dingy ochry towards the base, somewhat widened into the cap above. Flesh (particularly that of the stem) very firm, almost hard, white. Smell sweetish, aromatic, slightly farinaceous, but faint. Taste not bitter.

Spores broadly ovate, $5 \times 3\frac{1}{4}$ — $3\frac{1}{2} \mu$. Basidia 6μ broad. Cyst. 0.

Fig. spec. (D. A. suppl.): Carolinekilde near Odense, in park, on naked soil under *Ulmus*, Oct. 4. 1932. (Two specimens).

T. guttatum seems to be very differently conceived by the mycological authors. My plant answers very well to the description and figure given by BARLA (loc. cit.). COOKE's figure of *T. g.* is something entirely different, and SCHAEFFER's figure is not too good. RICKEN and NÜESCH take it to be a synonym of *T. acerbum* (which is far from my plant): The American species *T. nobile* Pk. seems to be very close, almost identical, but for the globose spores.

b. *Glabrata*.

1. *Echinospora*.

Stirpe 9: *constrictum*.

29. **T. constrictum** (Fr.). (*Armillaria c.*).

Diagn.: Rather small. Cap 3—4 cm., strongly convex, almost glabrous, white, very fleshy. Gills very crowded, thin and narrow, white. Stem slightly attenuated upward, white, slightly fibrillose-floccose up to the apical, narrow ring, solid and rather firm. Smell strong of meal.

Spores broadly oval, $7 \times 5 \mu$, granulate-verrucose. Basidia 4-spored.

Fig. spec. (D. A. suppl.): Odense, from grassy common, Sept. 1925 (a single specimen). Rare.

30. **T. leucocephalum** Fr. (ex Robert Fries).

Diagn.: Rather small. Cap 4 cm., convex, somewhat gibbose, comparatively thick-fleshed, silky-shining, pure white. Gills rather narrow, crowded, thin, almost free. Stem slender, somewhat Collybioid, slightly incrassated below, with a slender root, not hollow. Strong farinaceous odour, slightly rank aftertaste.

Spores broadly oval, $6\frac{3}{4}—8 \times 5 \mu$, coarsely verrucose. Cystid. 0. Basidia about 7μ broad.

Fig. spec. (D. A. suppl.): Lolland, Okt. 1932, leg. H. F. Møller.

T. leucocephalum is often wrongly conceived. Thus RICKEN describes it as a plant with smooth, subspheric, small spores and rather broad, distant gills that turn pink with age. This probably is a slender pale form of the *saponaceus*-stirpe (*cnista* Fr.). The characteristic strongly verrucose spores of *T. l.* were first described by ROB. FRIES (loc. cit.).

2. *Sublævispora*.

* *Collybiari*.

Stirpe 10: *ionides*.

31. **T. ionides** (Bull.).

Diagn.: Small. Cap about 3 cm., somewhat violet, soon becoming fuscous, convex-flat. Gills rather narrow and crowded, white with a slight tinge of yellow. Stem slender, somewhat paler than the cap.

Spores narrow ellipsoid, $6-7 \times 3 \mu$ (or $5\frac{1}{2}-6 \times 2\frac{3}{4} \mu$ 1914).

Not figured. Sent to me by F. H. MØLLER (1930 and 32) from Falster, and also found by POUL LARSEN near Århus under Fagus, Oct. 1914. — (Both finds represent the form *pravum* Fr. (*purpureum* Pers.)). (I myself have found a still smaller form with smaller spores, Fyn 1902).

32. *T. persicolor* Fr.

Diagn.: Small. Cap 3—4 cm., convex-flat, slightly gibbose, thin-fleshy, smooth, light fleshcolour, with a tinge of pink, slightly brownish in the middle. Flesh white. Gills rather narrow, crowded, almost white. Stem slender, cylindrical (5 cm. \times 4 mm.), soon hollow, somewhat cartilaginous, of the same colour as the cap, paler and slightly fibrillose above, tomentoso-strigose below. Generally subfasciculate. Smell and taste almost 0.

Spores narrow elliptical $5 \times 2\frac{1}{2} \mu$.

Fig. spec. (D. A. suppl.): Køge, on grassland near the seashore, Sept. 24. 1932 (leg. CHRISTIANSEN). Also met with in similar locality, Ærø 1932 (leg. LAURITSEN).

It is close to *T. carneum*, but more Collybioid and subfasciculate. I think it deserves specific rank, instead of being made a variety of *T. ionides*.

33. *T. carneum* (Bull.).

Diagn.: Small. Cap 2—3 cm., convex, pale pinkish fleshcolour, with incurved edge. Gills very narrow, almost free. Stem cylindric, rather short, of the same colour, slightly squamulose above, paler towards the naked base.

Spores oval, $5 \times 2\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 95): Tommerup, open space in plantation of Picea, in mossy grass, June 26. 1898. Also in grass on boggy ground, Sanderum, Aug. 1909 etc.

34. *T. pseudo-Flammula* n. n. (*T. cerinum* Nüesch, nec Fries). (Plate 1, fig. f 1—4).

Diagn.: Rather small. Cap $2\frac{1}{2}-5$ cm., comparatively fleshy, convex, edge strongly incurved (in large specimens wavy) slightly felty, sulphur-yellow, the rest of the cap fulvous-orange. Gills extremely narrow (1—2 mm.), very crowded, arcuate, slightly emarginate or almost decurrent, yellow to slightly fulvous. Stem almost cylindric or broader above, short (2—4 cm.) rather stout and firm, of the same colour, more brownish towards the white-felty base. Flesh sulphur-yellow. Taste slightly rank or a little bitter.

Spores subspheric-ovate, $3-3\frac{1}{4} \times 2-2\frac{1}{2} \mu$. Sporedust pure white.

Fig. spec. (D. A. pl. 96): Glamsbjerg in deep bed of needles, wood of Picea, Aug. 28. 1900, very numerous. Also in similar localities in later years.

I make bold to give this characteristic species a new name. It is probably often dubbed *T. cerinum*. But none of the (very different) specimens depicted by FRIES (*Icon. sel.* tab. 39.1) bear any likeness to my plant, and he describes it "colore sordide cerino l. fusciscente . . . caro alba". COOKE's figure (l. c.) is indifferent, and REA evidently follows Fries. On the contrary NÜESCH gives a very good description of my plant (as *T. cerinum*) and so does RICKEN (although his figure is mediocre. — Large specimens with a stout, obconical stem are almost *Clitocybe*-like, but I retain it in *Tricholoma* on account of its affinities. However, it is not altogether improbable that Fries has created his *Ag. (Clit.) venustissimus* on large specimens of this species. (Vide *Icones sel.* pl. 50).

35. **T. fallax** Peck. (*T. chrysenterum* (Bull.(?)) Bres.

Diagn.: Small. Cap 2 cm., thin-fleshed, yellow (of one colour), rather flat. Gills paler yellow than in no. 35, broad (3—4 mm.) somewhat ventricose. Stem rather slender, cylindric. Flesh yellowish.

Spores subspheric-oval, $3-3\frac{1}{2} \times 2\frac{1}{4}-2\frac{1}{2} \mu$.

Not figured. — Langesø, in dense plantation of *Picea*, solitary, Oct. 2. 1932.

Answers very well to the description of NÜESCH (loc. cit.), except that he gives somewhat larger dimensions for the spores (4—5 μ long) (while PECK himself has 3 μ); and he describes the flesh as white. BRESADOLA figures and describes the same species sub. nom. *T. chrysenterum*. But the *T. chrys.* of FRIES is a fagophilous plant. Finally the *T. chrysenterum* of RICKEN is again something entirely different. — I therefore prefer the undisputed name. (MURRILL (loc. cit.) introduces a new name: *Melanoleuca Naucoria* for *T. fallax* Peck).

** *Carnosa.*

† *Subsicca.*

o *Nigrescentes.*

Stirpe 11: leucophæatum.

36. **T. leucophæatum** Karst.

Diagn.: Medium. Cap 4—7 cm. convex-flat, dirt-gray, not hygrophanous, innato-fibrillose, towards the edge somewhat felty. Gills pale dirt-gray, rather crowded, almost free. Stem rather tall, cylindrical or somewhat swollen, whitish above, dirt-gray, somewhat grooved-striate towards the base, about 1 cm. thick, with a short "root". Flesh pale grayish, fuscous over the gills. All parts of the fruitbody turn blackish (at first somewhat bluish-black) when touched.

Spores oblong-oval, $6-6\frac{1}{2} \times 3\frac{3}{4} \mu$.

Fig. spec. (D. A. pl. 85): Hesselager, rather numerous in moist wood of *Picea*, Oct. 28. 1909. Rare.

This species seems to be allied to *Tricholoma (Collybia) semitale* Fr.; but the cap of this latter species is said to be glabrous and hygrophanous, of a darker sootbrown colour. It is in many respects very close to *Clitocybe gangrænosa*, but the gills are deeply emarginate. KARSTEN has created a new genus *Lyophyllum* for it (he originally placed it in *Collybia* and *Tricholoma*). *T. fumescens* Peck (from U.S.A.) seems to be identical.

37. **T. crassifolium** (Berk.?) Ricken.

Diagn.: Rather large. Cap 6—7 cm., convex, with age slightly depressed, pallid, then dark gray, smooth. Gills distant, dark fuscous, (edge soon blackening) almost free, becoming white-pruinose, very thick, somewhat succulent. Stem rather short, extended in the cap, 1.5—2 cm. thick, somewhat fibrillose towards the base, soon — especially when touched — becoming blackish like the originally white flesh, which is thick in the middle, thin at the edge. — Taste somewhat bitterish, smell faint.

Spores almost spheric, $6-7 \times 5\frac{1}{2}-6 \mu$. Basidia about 7μ broad.

Fig. spec. (D. A. pl. 84): Tiselholt, on the ground amongst foliage, deciduous wood, Oct. 8. 1923. (Described from two rather superannuated specimens).

T. crassifolium Berk. is hardly identical. My plant was not Collybioid; but I have seen specimens, collected by F. H. MØLLER, in which the stem was more cartilaginous and more slender. By these characters approaching *T. immundum* (Berk.) Sacc. (Vide KONRAD: *Icon. sel.*).

oo *Laticolores*.

§ *Macrospora*.

Stirpe 11: sulphureum.

38. **T. sulphureum** (Bull.).

Diagn.: Medium. Cap 4—7 cm., convex or somewhat gibbose, sulphur, often flushed with a pale brownish colour in the middle. Gills broad, very distant, sulphur. Stem tall, slender, of the same colour. Smell strong, nauceous.

Spores ellipsoid, somewhat lemon-shaped, $9-10\frac{1}{2} \times 5-5\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 94): Hjallesø, wood of Fagus, Oct. 19. 1896. Common.

(*T. inamoenum* (which evidently is very closely allied with *T. s.*) has been met with in coniferous woods by F. H. MØLLER. It has the same smell and large spores as *sulphureum*, but is whitish).

Stirpe 12: alba.

39. **T. album** (Schaeff.).

Diagn.: Large to medium. Cap 5—10 cm., convex, slightly gibbose, alutaceous-white, slightly ochraceous in the middle, edge in large specimens often somewhat grooved. Gills rotundato-adfixed, almost

free, white (when decaying often spotted black). Stem rather stout, slightly flocculose at the apex, white. Smell disagreeable, rankish, aftertaste acrid (rhizome of *Calla*).

Spores ovate, $5\frac{1}{2}$ — $6 \times 3\frac{3}{4}$ — 4μ .

Fig. spec. (D. A. pl. 89): Lindenberg, in the valley, in large circles in *Betula*-copse, on meadowy ground, Sept. 19. 1900. Rather common, probably always under *Betula*.

Like ROMELL (*Hymen. of Lappland*) I look upon this rather large form of *T. album* as identical with *T. raphanicum* (Karst.).

40. *T. lascivum* Fr.

Diagn.: Medium to rather small. Cap 4—7 cm., expanded, subumbonate, alutaceous to very pale tan. Gills deeply emarginate, white. Stem somewhat acuminate at the base, whitish, generally with a flush of pale tan or subochraceous midway. Smell at first rather sweetish-aromatic (*Syringa*), but soon becoming nauseating. Taste bitterish, slightly acrid.

Spores oval, 6 — $7 \times 3\frac{1}{2}$ — $3\frac{3}{4} \mu$. Cystidia 0.

Fig. spec. (D. A. pl. 88): Hjallesø, mixed frondose wood, Oct. 23. 1897. Rather common, in deciduous woods, chiefly under *Quercus* (as also observed by ROB. FRIES), but also in woods of *Fagus*.

This species is almost too close to *T. album* and may be regarded as a variety. It is less robust, flushed with clay-brownish or pale tan. I have never seen it blackening, and never met with it under *Betula*.

Stirpe 13: saponaceum.

41. *T. sudum* Fr.

Diagn.: Rather large to medium. Cap 5—7 cm., convex, slightly gibbose, moist, but not viscid, smooth, watery-gray, edge paler. Gills less distant than in *T. saponaceum*, at first whitish, soon becoming gray, broadly emarginate. Stem cylindric, 1—1.5 cm. thick, somewhat rooting-acuminate, slightly fibrillose-striate (or very slightly white-flocculose) whitish, solid, downward somewhat flushed with fleshcolour when old. (The whole plant has a tendency to become slightly flushed with the same colour). Slight farinaceous taste and bitterish aftertaste. Smell faint, farinaceous-rancid.

Spores narrowly ovate, $5\frac{1}{2}$ — $6\frac{1}{2} \times 3\frac{1}{2}$ — $3\frac{3}{4} \mu$.

Fig. spec. (D. A. pl. 83): Håre Bjerger near Gelsted, in plantation of *Pinus* and *Picea*, rather numerous, Oct. 27. 1914. — Also at Ålsbo and Langesø, similar localities, 1914—32.

This species evidently is very close to *T. saponaceum*; the most marked differences being the gray gills and the somewhat narrower spores. — FRIES gives a very good description and figure of it, in *Icon. sel.* — The *T. sudum* of RICKEN does not belong here.

42. *T. saponaceum* Fr. var. a) *ardosiaca* Bres.

Diagn.: Medium. Cap 4—7 cm., fleshy, convex, somewhat umbonate, brownish- or olivaceous-gray, indistinctly innato-squamu-

lose. Gills broad, rather distant, whitish. Stem solid, paler than the cap, more or less fuscous-squamulose or -fibrillose, attenuated downward, rather stout. Smell faint, not farinaceous, but rather vapid ("saponaceous" ex Fries). The whole plant, more especially the gills, becomes flushed with salmon-pinkish with age.

Spores ovate, $5\frac{1}{2}$ — $6 \times 3\frac{1}{2}$ — 4μ .

Fig. spec. (D. A. pl. 81): Rold, wood of *Picea*, in moss, Sept. 15. 1897.

Also met with in woods of *Fagus*, but rather infrequent. COOKE'S figure of *T. s.* represents this form very well.

43. **T. sap.** var. b) *napipes* Krombh.

Diagn.: Medium to rather large. Cap 5—8 cm., strongly umbonate, yellowish. Gills pale sulphur. Stem somewhat rooting, slightly ventricose, without any dark scales or fibrils, yellowish. For the rest as above.

Spores broadly-ovate, 5 — $5\frac{1}{2} \times 3\frac{1}{2}$ — 4μ .

Fig. spec. (D. A. pl. 82): Ålsbo bakker, wood of *Picea*, Oct. 18. 1899.

Not uncommon, but often of a less conspicuous type: paler, stem less stout, cylindrical.

44. **T. sap.** var. c) *cnista* Fr.

Diagn.: Medium. Cap 5—7 cm., convex-expanded with a subconical umbo, almost silky, whitish, dingy-pale in the middle. Gills white, very broad, soon becoming flushed with pinkish. Stem white, cylindrical, slightly rooting (root somewhat acuminate), comparatively short, rather firm-fleshed. Smell faint, slightly aromatic (Mushroom—Mar. Oreades).

Spores subspheric-ovate, $5\frac{1}{4}$ — $6 \times 3\frac{3}{4}$ — 4μ .

Fig. spec. (D. A. pl. 101): Hunderup, wood of *Fagus*, on hard and dry humous ground, a number of specimens, Sept. 1903 (and later years).

The much disputed *T. cnista* Fr. has been interpreted in many ways. BRESADOLA applies the name to a *Melanoleuca* species, and he is followed in this by Nüesch and Ricken. But the broad, reddening gills forbid such an interpretation. To my mind the present plant is the true *Ag. cnista*; but it hardly deserves specific rank.

Stirpe 14: gambosum.

45. **T. gambosum** Fr.

Diagn.: Large. Cap 7—13 cm., very fleshy, cream or alutaceous-white, often irregular. Gills rotundate, very crowded (but not narrow), white. Stem solid, very stout, white. Farinaceous odour.

Spores oval, $5\frac{1}{2} \times 3\frac{1}{4} \mu$. Basidia 4-spored.

Fig. spec. (D. A. pl. 92): Hjallese, in grass, hedgerow under *Salices*, May 28. 1898. Not uncommon (in May and June) in certain years, in open spaces or under trees, often in rows.

46. **T. graveolens** (Pers.) Schroeter.

Diagn.: Rather small. Cap 3—5 cm., subglobose-convex, very fleshy and firm, alutaceous to pale or dark tan. Gills very narrow and crowded, arcuate, alutaceous. Stem solid, short, whitish, becoming somewhat fuscous from base upward, inside and outside. Odour farinaceous.

Spores oval, $5 \times 2\frac{3}{4} \mu$.

Fig. spec. (D. A. pl. 91): Vejøl near Næstved, in wood of *Fagus*, July 1904. — Also at Kajberg, wood of *Fagus*.

Several authors (e. g. RICKEN) include no. 45 and 46 under the common name *T. Georgii* (Clus.) together with other varieties.

The *T. graveolens* here described answers very well to the diagnosis of SCHROETER (loc. cit.), while other authors describe a form that turns almost sootbrown with age. REA uses the name *T. Georgii* exclusively for a form very close to my *T. graveolens*. — *T. albellum* as figured by Barla (l. c. pl. 41) equals my *T. gambosum*.

Stirpe 15: panæolum.

47. **T. panæolum** Fr.

Diagn.: Medium to rather large. Cap 5—8 cm., pallid to dark dirty gray, convex, often irregular (edge often somewhat grooved) and spotted with darker droplike spots (*Lactarius blennius*). Gills dirt-gray with a tinge of flesh-colour, crowded. Stem short, paler than the cap, solid, fibrillose-striate. Flesh white. — Often clustered.

Spores broadly ovate, $5 \times 3\frac{1}{4} \mu$. Cystidia 0. Sporedust-colour c 8 (pale dingy fleshcolour-clay).

Fig. spec. (D. A. pl. 90): Slipshavn near Nyborg, grassy common near the coast, Sept. 1905. Not uncommon in similar localities.

48. **T. geminum** (Paul) ex Sev. Petersen (*Rhodopaxillus truncatus* (Bres.) Maire).

Diagn.: Medium to rather large. Cap 5—9 cm., fleshy, edge incurved; colour gilvous-tan or pale fleshcolour-ochre (c 6—c 8), minutely flocculose. Gills narrow, arcuate, slightly emarginate to subdecurrent, paler than the cap, crowded, somewhat eroded. Stem firm, solid, rather short, almost white, slightly fibrillose-striate, often a little thicker above, slightly mealy-granulate above. Faint Oreades-smell.

Spores broadly-ovate, $6 \times 4 \mu$ (or $5\frac{3}{4} \times 4$. Basidia 4-spored. Cystidia 0 (1930)), slightly scabrous(?) 1928). Sporedust with a flush of pale fleshcolour or salmon.

Fig. spec. (D. A. pl. 93): Ålsbo bakker, in troops on the naked needle-bed, in wood of *Picea*, July 29. 1909. Not uncommon.

SEV. PETERSEN (loc. cit.) describes this species very well under the Pauletian name. But later BRESADOLA has applied the name *Ag. truncatum* Fr. (which FRIES uses for a *Hebeloma*) to it; and MAIRE has referred it to *Rhodopaxillus*. The whole plant is some-

what Clitocyboid, and it is not unlikely that the Friesian species *C. opiparus* is synonymous (*Ag. geminus* he only knew from description). The Friesian diagnosis for *Ag. truncatus* does not fit very well for the present species; he describes the gills as becoming *ferruginous* with age.

49. **T. irinum** Fr.

Diagn.: Large to very large. Cap 7—14 cm., thick-fleshy, convex-flat or slightly gibbose, alutaceous-pale with a tinge of fleshcolour. Gills crowded, almost of the same colour. Stem whitish, fibrillosovenose, stout and solid. Flesh white. Smell sweetish-aromatic (*Iris florentina*).

Spores ellipsoid, $8 \times 3\frac{1}{2}$ — 4μ .

Fig. spec. (D. A. pl. 98): Fruens Bøge, moist boggy ground in frondose wood (*Fraxinus* etc.), very numerous, Oct. 22. 1899. Not uncommon in similar localities (*fraxinophilous*?).

From pallid lilac forms of the *nudum* type it is most easily recognized by the sweet smell.

Stirpe 16: *nudum*.

50. **T. personatum** (Fr. ex parte) Berk. = *anserinum* Fr.

Diagn.: Large. Cap 6—10 cm. slightly umbonate, alutaceous to pale dirt-gray. Gills crowded, dingy whitish with a flush of dirt-grayish fleshcolour when old. Stem stout, somewhat incrassated below, pallid, more or less flushed with violet-blue, more or less scaly-fibrillose. Flesh white.

Spores ovate-oval, $6\frac{1}{4}$ — $7\frac{1}{2} \times 4$ — 5μ .

Fig. spec. (D. A. pl. 100): A: Dalum Landbrugsskole, in shrubbery, Oct. 1900 (old specimens). B: Hjallese, outskirts of wood in grass, Oct. 1901. — Rather common, till late in the autumn.

The pallid, never violet gills and the at first bluish, scaly (not mealy) stem distinguish this species from discoloured forms of *T. nudum*. It generally grows in grassy places, but in the vicinity of trees. *T. personatum* v. *anserinum* (ex Fries) belongs here, while his other forms must be referred to *T. nudum*.

51. **T. nudum** (Bull.).

Diagn.: Rather large. Cap 6—10 cm., convex-flat, dark watery fuscous-violet, soon discolouring. Gills crowded, pale violet, becoming pale dingy lilac. Stem solid, pale violet-blue, mealy above. Flesh more or less tinged with the same colour.

Spores ovate-oval, $7 \times 4\frac{1}{2} \mu$ (or $8 \times 5 \mu$),

Fig. spec. (D. A. pl. 99): Arup, wood of *Fagus*, Oct. 1905. Very common, especially in woods of *Picea*, in large circles (up to 8 m. in diameter with 130 fully developed fruitbodies!).

T. sævum Gill is an intermediate form (but next to *nudum*) and so is *T. glauco-canum* Bres. (cap and gills more pallid). They hardly deserve specific rank.

†† Hygrophana.

52. **T. sordidum** Fr.

Diagn.: Rather small to medium. Cap 4—7 cm., watery brownish-lilac, becoming altogether fuscous-brownish, thin-fleshy often deformed. Gills pale bluish-lilac, soon discolouring. Stem slightly fibrillose, rather thin, often crooked, colour of cap. Flesh of the same colour, but paler. Often clustered.

Spores ovate-ellipsoid, $6\frac{1}{2}$ — $7\frac{1}{2} \times 3\frac{1}{2}$ — 4μ . Cystidia 0. Basidia 4-spored.

Fig. spec. (D. A. pl. 110): Hjallesø, in richly manured flowerbed, Nov. 1899. Common in similar localities: kitchengardens, compost-heaps etc., till late in the season.

53. **T. calathus** (Fr.) Bres. (*Clitocybe* Fr.).

Diagn.: Small. Cap 3—4 cm., submembranaceous, soon depressed (slightly umbonate), margin indistinctly striolate, dingy pale lilac. Gills rather crowded, very pale lilac, subdecurrent. Stem slender, paler than the cap, smooth.

Spores 6 — $6\frac{1}{2} \times 3\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 151): Fruens Bøge, under *Betula* in mixed frondose-coniferous park, Aug. 22. 1902. Solitary.

Although this species has a distinctly *Clitocybe*-like, almost *Omphaleoid* character, its close proximity to *T. sordidum* makes it preferable to place it in this stirpe.

Stirpe 17: putidum.

54. **T. putidum** Fr. (nec Quél.). (Plate 1, fig. e 1—4).

Diagn.: Rather small. Cap 4—7 cm., convex-expanded with a small umbo, watery dirt-brown, glabrous, minutely pellucido-striate at the edge when wet; pale dirtbrownish or clay when dry, very fragile and watery. Gills rather crowded, somewhat emarginate, adnexed, dirt-grayish. Stem 5—6 cm. \times 5—9 mm., even, pale, with a very thin coating of whitish, subfibrillose pruina (not flocculose), somewhat hollow with age, brittle and often flattened. Flesh of cap and stem watery dirt-brown. Smell rancid-farinaceous, but not very strong.

Spores oval, $6 \times 3\frac{3}{4} \mu$.

Fig. spec. (D. A. pl. 109): Kohave near Årup, wood of *Picea*, rather numerous, Oct. 1905. Not uncommon in similar localities.

This species is not very well known by the various authors. FRIES' figure (in *Icon. sel.*) is unsatisfactory. BARLA'S (loc. cit.) gives a better impression of its habit, but shows the flesh white. The minute striation is overlooked by all the authors. REA and QUÉLET describe a large-spored species which does not belong here. COOKE'S figure is dubious. It differs from *Collybia inolens* in being brownish, not gray, with a less slender stem, without a white-flocculose apex.

T. livivium Fr. (to which I formerly referred my plant) differs in having white, inodorous flesh.

B. MELANOLEUCA Pat. (sensu restr.)¹⁾.

Stirpe 18: melaleucum.

55. *T. grammopodium* (Bull.).

Diagn.: Large to very large. Cap 8—11 cm., soon depressed with a rather prominent umbo, fuscous brown, expallent, umbo somewhat darker. Gills arcuato-subdecurrent, rather narrow, white, becoming whitish-pale. Stem attenuated upward, tall, paler than the cap, striate with darker lines. Flesh whitish, slowly turning fuscous-brown from base of stem upward.

Spores oval, 8—9 × 5½ μ, minutely verrucose. Basidia 4-spored. Cystidia harpoonlike (acuminate with crystalloid spinelets at the top).

Fig. spec. (D. A. pl. 102): Fruens Bøge (wood of *Quercus*), Sept. 1908. Not common (but often in large numbers) in moist places in woods. — The *grammopodium* of MURRIL (white cap, emarginate gills) hardly belongs here.

56. *T. sp.* (*brevipes* Bres. nec al.).

Diagn.: Cap large to very large, 9—13 cm., clay-brownish to pale tan, depressed, umbonate (umbo somewhat darker). Gills whitish-pale (or with a flush of clay-yellowish). Stem very short and stout.

Spores and Cystidia not investigated.

Not figured. This characteristic form grew in a large circle in an open space, on lawn, at Gisselfeld park, Oct. 6. 1929.

It is very well figured by BRESADOLA (in *Icon. myc.*) sub nom. *T. brevipes*; but it is not the *T. b.* of other authors. From *T. grammopodium* it differs chiefly by the short stem and paler colour.

57. *T. humile* Fr. var. *fragillima* Fr.

Diagn.: Small. Cap 2—3 cm., expanded, umbonate, pale gray, somewhat darker in the middle. Gills white, emarginate, ventricose. Stem very thin, cylindric, slender (4 cm. × 3 mm.), fuscous-gray from base upward; flesh soon becoming dirt-brown.

Spores and cystidia of the usual *Melanoleuca*-type.

Fig. spec. (D. A. pl. 107): Hjallese, grassy place in copse, Oct. 1908. Not uncommon, generally solitary, at roadsides and other grassy open spaces.

58. *T. melaleucum* (Pers.).

Diagn.: Medium to rather small. Cap 4—7 cm., convex-plane, with a somewhat darker umbo, generally brownish fuscous. Gills white

¹⁾ Originally *Melaleuca* (PATOULLARD: *Les Hymenomycètes d'Europe*, 1887.

or whitish. Stem slender or medium, pallid, somewhat fibrillose-striate with darker fibrils, somewhat incrassated downward. Flesh becoming dirt-brownish from base upward.

Spores and cystidia as usual.

Fig. spec. (D. A. pl. 104): Hjallese, mixed frondose wood, Oct. 30. 1895. — Common in woods and in the open.

A somewhat shorter, very dark (pitchbrown) form with a dark fuscous stem, *T. Friesi* Bres., is occasionally met with in frondose woods.

59. **T. stridulum** Fr.(?) var. *pallidipes*.

Diagn.: Medium to rather small. Cap 5—6 cm., rather flat, slightly umbonate, dark fuscous-brown. Gills narrow, somewhat arcuate, adnato-decurrent, white. Stem slender, slightly attenuated upward, gray, somewhat striate. Flesh of stem remaining white for a long time.

Spores and Cystidia as usual.

Fig. spec. (D. A. pl. 105): Rønshoved (Flensborg), solitary in wood of Fagus, Sept. 1900. (Also at Rold, Sept. 1897). — Almost a miniature of *T. grammopodium*. My plant is very like the form figured by BRESADOLA (*Icon. myc.*), but even more pale-stemmed and with much more whitish flesh. Bresadola's species in this respect comes nearer to my *T. melaleucum*.

60. **T. brevipes** Bull.

Diagn.: Medium. Cap 5—7 cm., convex, obsolete umbonate, dark fuscous when young. Gills white, deeply emarginate. Stem very short, stout (3—4 cm. × 1—1.2 cm.), whitish, slightly fibrillose, subconic, rapidly becoming dark dirt-brown inside.

Spores and Cystidia as usual.

Fig. spec. (D. A. pl. 108): Fruens Bøge, compost- and leafmould-heap in wood, Oct. 1898. Rather common, late in the autumn in similar places, but often less typical, more *melaleucum*-like.

61. **T. strictipes** Karst.

Diagn.: Rather large or large (Cap 6—13 cm., averaging 8 cm.) at first watery hornbrownish-gray, then whitish ashy-gray (*Clitocybe nebularis*), slightly umbonate. Gills flatly emarginate, subdecurrent, whitish. Stem rather slender but not tall, not striate, cylindric, at first slightly mealy, but soon glabrous. Flesh whitish, remaining pale in the stem.

Spores and Cystidia as above.

Not figured. Growing on heap of rotten straw, chaff etc., rather numerous, in a garden, Husmandsskolen, Odense, Aug. 25. 1929. — KARSTEN'S species is quoted as a probable synonym of *T. evanosum* by KONRAD (loc. cit.) which is very likely; but then *T. s.* should be maintained as the older name.

62. *T. s.* var. = (*T. Schumacheri* Fr.)?

Diagn.: Rather large. Cap 7—9 cm., convex-flat (edge involute, free), slightly gibbose, pale-gray (*Clit. nebularis*). Gills flatly emarginate, with a decurrent denticle, white. Stem solid, of medium height, not powdered, but everywhere innato-fibrillose (dirt-brownish lines on a pale base). Flesh in cap white (thick in the centre, thin towards the margin); that of the stem pallid.

Spores as usual. Cystidia rather sparse, hairshaped-subulate slightly incrassated at the base (7μ), without crystalloid setulae, free portion about 25μ .

Fig. spec. (D. A. suppl.): Næsby, moist ground in frondose wood, a number of specimens, Sept. 1923.

It seems to me not at all unlikely that this is the true *T. Schumacheri* of Fries, which various authors have interpreted in different ways. The only marked difference is that in my plant the flesh of the cap is rather thin. The figure in Flora Danica, Tab. 2267¹, fits fairly well. — KILLERMANN (*Pilze aus Bayern*) also ascribes to *T. S.* spores of the same type (granulate, spherocellipsoid, $7 \times 5\mu$).

63. *T. excissum* (Fr.?) Rick.

Diagn.: Medium. Cap 4—8 cm., convex-flat, at last somewhat depressed, pale ashy-gray with a prominent, almost mammiform, dark gray umbo, slightly hygrophanous. Gills whitish, rather narrow, slightly emarginate. Stem rather short ($3\frac{1}{2}$ —6 cm.), almost cylindric, absolutely glabrous. Flesh whitish-pale everywhere.

Spores as above. The figured specimens were entirely devoid of cystidia; but in another find, the gills had the ordinary type of cystidia (but with a transverse septum between the neck and the body of the cystidium).

Fig. spec. (D. A. pl. 106): Ålsbo, forming a circle in grassy open space in a wood, Oct. 1919. — Also at Langesø, similar locality, Sept. 1925.

Also BRESADOLA has noticed that this species is devoid of cystidia; (but his figure depicts a much more slender, white form).

64. *T. arcuatum* (Bull.) Sev. Petersen, forma *robusta* Lange.

Diagn.: Large. Cap 8—11 cm., plano-convex, Vandyke-brown, somewhat shining. Gills at first whitish-isabelline, later pale gilvous-ochre, emarginate with a decurrent tooth. Stem short (5 cm.), rather stout, whitish, somewhat fibrillose-striate with minute lines that become pale gilvous. Flesh of stem slightly gilvous, whitish at the base and in the cap. Smell faint.

Spores and Cystidia as usual.

Fig. spec. (D. A. suppl.): Langesø ("Komigen"), Aug. 18 and Oct. 8. 1928.

FRIES describes *T. arcuatum* as having white gills, but the various figures in BULLIARD's tab. 443 are yellowish-gilled. BRESADOLA

uses the name *arcuatum* for the form that is here called *T. cognatum* Fr. The present ultra-typical form I designate as *T. a. forma robusta*. *T. humile* var. *evectum* Grove may be synonymous. *T. phæopodium* of BRESADOLA (but not *Ag. phæopodius* Fr. which is a *Collybia butyracea*-form) differs in having a dark fuscous stem.

65. **T. cognatum** Fr. (= *T. arcuatum* Bres.).

Diagn.: Medium to rather large. Cap 6—8 cm., convex-flat, light ochraceous tan (somewhat isabelline at first, becoming light gilvously-ochre). Gills at first isabelline, then gilvously-ochraceous, emarginate. Stem slender and tall (about 7 cm.), subbulbous, fibrilloso-striate, colours of cap.

Spores and Cystidia as usual.

Fig. spec. (D. A. pl. 103): A: Våsemose, border of road in wood, in grass, Sept. 1905. B: Langesø, similar locality, Sept. 1909.

This is the most distinct of all the species, characterized by the slender stem and the gilvously-ochraceous colour of all its parts. — BRESADOLA's figure is excellent, but depicts rather over-ripe specimens. I have met with an intermediate form: Cap more brownish-café au lait. Stem pallid, less slender. This form squares exactly *Melanoleuca cognata* in the sense of KONRAD (*Icon. sel.*).

II. DERMOLOMA (Lange).

Stirpe 19: cuneifolium.

66. **T. cuneifolium** Fr.

Diagn.: Dwarfy. Cap $1\frac{1}{2}$ —3 cm., convex or subumbonate-expanded, paler or darker dirt-gray, often somewhat wrinkled and cracking. Gills almost triangular, attenuated-free, whitish, rather distant. Stem short, rather thin, slightly attenuated downwards, whitish, hollow. Distinct mealy smell.

Spores broadly ovate, $4\frac{1}{2}$ —5 \times 3— $3\frac{1}{2}$ μ . Cystidia 0. Basidia 4-spored.

Fig. spec. (D. A. pl. 86): A: Trolleborg, in grass, roadside, Oct. 7. 1898. B: Vormark, grassy road in wood, Sept. 1902.

To this group probably also belong some other small species, e. g. *T. caelatum*, *T. atrocinerum*.

The number of species (or distinct forms) figured or described in "D. A." and these Studies is 66, or — if the *Armillarias* etc. be deducted (and the genus taken in its Friesian sense) about 60. This is not much more than half the number from *Hymenomyces Europæi*, and considerably less than RICKEN describes (*Die Blätterpilze*) for Central Europe (85). NÜESCH (loc. cit.) (if the same delimitation be adopted) describes about 110; but of these he has only seen 55; a good many of the rest are Britzelmayerian chimæras.

Also REA records more than a hundred species for Great Britain. Permanent grassland, wild woodland and old parks, where neither the agriculturist nor the forester disturb the natural vegetation, offer to the British field-botanist a much richer hunting-ground than Denmark. And British mycological tradition reaches back to the 18th century.

But although the geographical conditions of Denmark are not favourable for the field-mycologist I do not doubt, that the number of Danish species can be considerably augmented. In fact some species are already on record. Both POUL LARSEN and SEV. PETERSEN ("*Danske Agaricaceer*") report the characteristic species *T. inodermum*; F. H. MØLLER has *T. inamoenum* from Sælland and *T. amarum* from the Southern Islands; and some others are on record of more or less dubious value. (More than 100 years ago SCHUMACHER described a species, *A. urbus*, which as far as I know has never been met with again, inside or outside of Denmark. The original figure (Flora Danica tab. 1844¹) makes it not unlikely that it is a *Pluteus*, close to *P. salicinus*).

THE GENUS LENTINUS.

While *Lentinus* plays a very insignificant rôle in the flora of the temperate zone, it rises to great importance when nearing the equatorial (*Saccardo V* enumerates over 200 species, while *FRIES* only has about 25 for Europe). The same is true of *Panus* and *Marasmius*, its nearest relatives. In general the subcoriaceous types seem to be particularly well adapted to the hot climates.

But for Denmark the genus *L.* plays a still more reduced part. I myself have only found 4 species, and only two of these are of common occurrence. This is easily explained by the fact that most of the species inhabit fallen trunks, rotting branches etc. which are found in abundance in the wild or primeval forests, but become scarcer and scarcer the more rationally the woods are treated. And here in Denmark practically all the woods are plantations, in which stumps are removed and superannuated trees rarely tolerated by the forester.

Still it is not at all unlikely that some of the Scandinavian or German species which have hitherto been sought in vain in Denmark will be brought to light in the future. The extension of the coniferous plantations — most of which are still young — will in time give the xylophilous fungi a better chance, just as we have had in later years an invasion from the North of pinophilous flowering plants.

About the taxonomy of the genus little need be said (as long as only our own species are taken into consideration). *Lentinus* is distinguished from *Panus* (which genus by some authors is included in *L.*) by the somewhat dentate gills which have a tendency to split transversely. These characters also serve to distinguish the *Lentini* from *Pleurotus*, with which they have the somewhat excentric cap in common. Nearly all the European species are xylophilous; even *P. omphalodes*, the only species that grows on the ground, has its nearest relatives on wood.

KEY

TO THE SPECIES OF THE GENUS LENTINUS FIGURED IN
"DANMARKS AGARICACEER".

- A. *Lepideus*. Cap and stem scaly.
 Cap rather large, pale wood-brownish, with a distinct subcentral stem 1. *L. lepideus*.
- B. *Cochleati*. Cap glabrous.
a caespitose or fasciculate 2. *L. cochleatus*.
β subsolitary.
 a. Stem almost central, rather long (growing on the ground)
 3. *L. omphalodes*.
 b. Stem more or less excentric or lateral (on decaying wood)
 4. *L. bisus*.

SYSTEMATIC AND FLORISTIC NOTES.

1. *L. lepideus* Fr. (*squamosus* (Schaeff.)).

Diagn.: Rather large. Cap 5—8 cm., pale wood-coloured, coarsely scaly (scales darker brownish). Gills whitish, large, emarginate. Stem subcentral, cylindric, scaly, somewhat annulate, often somewhat rooting.

Spores cylindric, ellipsoid, $9-11\frac{1}{2} \times 3\frac{3}{4}-5 \mu$. (Subspheric, $2-3 \mu$ ex Schroeter!)

Fig. spec. (D. A. pl. 948): Dalum, on sleepers, old railway-track, June 1897. Rather common, on old (coniferous) timber, chiefly when buried in the ground (sleepers, bulwarks etc.) from the beginning of June to early fall.

This species is famous for the peculiar shapes the fruitbodies attain when growing in the dark, on pit-props and the like: stag's-horn-like, branched bodies, which have attracted much interest among early mycologists.

2. *L. cochleatus* (Pers.) Fr. (*cornucopioides* (Bull.)).

Diagn.: Cap 3—5 cm., narrowly infundibuliform, somewhat irregular, wood-brown to somewhat fulvous-ochre or leather-brown. Gills deeply decurrent, pale. Stem often long, rooting, sulcate, fasciculate. Often growing in dense clusters. Odour somewhat aromatic (anise).

Spores subspheric, $5 \times 4 \mu$.

Fig. spec. (D. A. pl. 949): Fruens Bøge, stump of *Fagus*, Sept. 1897. Rather common on and around stumps of deciduous trees (*Fagus*, *Acer* etc.).

3. *L. omphalodes* Fr.

Diagn.: Rather small. Cap about 3—4 cm., convex, deeply umbilicate, dingy pale tan. Gills whitish, rather broad, subdecurrent. Stem rather tall, subcentral, attenuated downwards, irregularly sulcate-lacunose.

Spores broadly oval, $8 \times 5-5\frac{1}{2} \mu$.

Fig. spec. (D. A. pl. 950): Svanninge bakker, a number of specimens growing on the ground (sandy soil) amongst grass, *Euphrasia* and *Amanita muscaria* in plantation of *Picea*, Sept. 1899.

4. *L. bisus* Quél. (ex Bres.). (Plate 1, fig. b 1—3).

Diagn.: Small. Cap thin-fleshed ($1\frac{1}{2}$ —4 cm.), convex, later somewhat depressed or deeply umbilicate, somewhat conchate, pallid tan with a tinge of *nude*, smooth, even, with age often irregular-wavy. Gills rather distant and thick, more or less serrulate, white with a tinge of the same colour, irregularly decurrent. Stem more or less excentric (or even almost lateral, short, $1\frac{1}{2}$ —3 cm.), apex extended into the cap, darker brownish than the cap and lacunososulcate. Smell 0.

Spores spheric-oval, slightly rough, $4\frac{1}{2}-5\frac{1}{4} \times 4 \mu$. Cystidia (very sparse) conical-subulate, free portion $25 \times 4 \mu$. Basidia 4-spored.

Fig. spec. (D. A. suppl.): Langesø Nordskov, on decaying trunk of *Picea*, a number of specimens, Nov. 28. 1929 (and 32).

Chiefly distinguished from the preceding species by the excentric or sublateral, very short stem and the smaller spores. — *L. scoticus* B. & Br. (Cooke's *illustr.* pl. 1143) is probably a synonym of *L. bisus*. The only difference is that the stem is said to be cylindrical, pulverulent; but in Cooke's figure it is shown somewhat grooved.

THE GENUS PANUS.

The poverty of the Danish *Panus*-flora can be accounted for in the same way as that of *Lentinus*.

Panus, as represented in Denmark, is a very incongruous genus; *P. stipticus* and *P. torulosus* have very little in common, except the toughness of the tissue. — From *Lentinus* it is easily distinguished by the nature of the gills. But some of the *Pleuroti*, e. g. *P. petaloides*, are very close to *Panus*.

KEY

TO THE SPECIES OF THE GENUS PANUS FIGURED IN "DANMARKS AGARICACEER".

- A. Stem more or less excentric or almost central.
 α Stem almost central; subsolitary 1. *P. torulosus*.
 β Stem excentric; fasciculate 2. *P. conchatus*.
B. Stem lateral (very short).
 α Whole plant pale tan to alutaceous 3. *P. stipticus*.
 β Whole plant milk-white 4. *P. s.* var. *lactea*.
-

SYSTEMATIC AND FLORISTIC NOTES.

1. *P. torulosus* (Pers.).

Diagn.: Almost regular, soon becoming infundibuliform, 5—7 cm. broad, colour wood-brown to pale tan (somewhat lilac fleshcolour when young). Stem short, cylindric, plushy-tomentose with a somewhat lilac, soon discolouring coating. Gills narrow, rather crowded, decurrent, of the same colours.

Spores ellipsoid, $5\frac{1}{2}$ —7 \times 3 μ . (Or 5 \times 2 $\frac{1}{2}$, Cystidia irregular, obtuse, up to 10 μ broad, clavate to somewhat bottleshaped (1932)).

Fig. spec. (D. A. pl. 947): Boltinggård, Ringe, on top of stump of *Fagus*, solitary, Sept. 1913 (and at Langesø, Aug. 1932).

In the last find the young caps were altogether pale lilac-flesh-colour and the edge minutely velutinous (hairs erect, hyaline, about 30μ long). The gills were slightly anastomosing. The flesh almost tasteless, slightly sweetish. — This is a transition to *P. conchatus* and to *P. rudis*.

2. *P. conchatus* Fr.

Diagn.: Cap very irregular, wavy-infundibuliform, becoming somewhat squamulose. The gills even narrower, often anastomosing, the stem very short, obconical, dilated in the cap. It forms fascicles of more or less deformed and conerescent individual fruit-bodies.

Spores $5-6 \times 3-3\frac{1}{4} \mu$, ovate-ellipsoid; Cystidia narrowly clavate. (Or spores oblong, $6 \times 3\frac{1}{4} \mu$; Cystidia of various shape, $6-8 \mu$ broad, cylindrical-clavate or somewhat ventricose, straight or somewhat meandering (1928)).

Fig. spec. (D. A. pl. 946): Hesselagergård, on stump of *Fagus*, Sept. 3. 1904. — Rather rare. Also met with on *Fraxinus* (Langesø, Aug. 28. 1928).

Like QUÉLET I regard these two 'species' as mere varieties which might be united sub nom. *P. flabelliformis* (Schaeff.); but their habit is very different.

3. *P. stipticus* (Bull.).

Diagn.: Cap 1—4 cm. broad, convex-flat, reniform, alutaceous-tan or wood-colour, minutely furfuraceous. Gills very narrow and very crowded, of the same colour or pale cinnamon. Stem whitish, very short ($\frac{1}{2}$ cm.), dilated into the edge of the cap. Taste very stypitic.

Spores very small, ovate, $3\frac{1}{2} \times 2 \mu$ (or $4-4\frac{1}{2} \times 2\frac{1}{2} \mu$).

Fig. spec. (D. A. pl. 944): Fruens Bøge, on trunk of *Betula*, Oct. 26. 1896. Very common on living stumps of *Betula*, *Quercus* etc.

4. *P. stipticus* var. *lactea* n. v.

Diagn.: In all respects exactly like the main species but for the total absence of any pigment, so that the whole plant is milk-white.

Spores oval, $5 \times 2\frac{3}{4} \mu$. Basidia 4-spored.

Fig. spec. (D. A. pl. 945): Hjallese, with the main species on stump of *Quercus*, Dec. 2. 1911. May be mistaken for a *Pleurotus*.

THE GENUS NYCTALIS.

This little genus of somewhat succulent-gilled, parasitic agarics, always growing on decaying *Russulas*, stands in a rather isolated position and has attracted much attention, resulting in very thorough-going descriptions. Its most remarkable characteristic is the production of the so-called *Chlamydospores*, which generally play a much more important role for the propagation than do the ordinary basidiospores which in many cases are entirely suppressed.

KEY.

- A. Chlamydospores forming a mealy-granular coating on the surface of the cap 1. *N. asterophora*
B. Chlamydospores on gills; Surface somewhat silky 2. *N. parasitica*.
-

1. *N. asterophora* Fr.

Diagn.: Cap 0.5—1.5 cm., subglobose, with a loose, mealy coating of pale to clay-brown meal all over. Gills pale, often incompletely developed. Stem short or almost 0.

Spores. 1) Chlamydospores large, substellate, body of spore roundish-oval, about $12\ \mu$ long, set all over with blunt, pyramidal, coarse, $4\text{--}5\ \mu$ long prickles. 2) Basidiospores (chiefly found on young specimens) ovate, $5\frac{1}{2} \times 3\frac{1}{2}\ \mu$, hyaline.

Fig. spec. (D. A. pl. 920): Hjallese, in wood, on *Russula nigricans*, Sept. 30. 1903. — Rather common in years with a great rainfall.

2. *N. a. forma major*. (Plate 1 fig. d 1—4).

Larger. Cap $1\frac{1}{2}$ —2 cm., convex. Gills better developed and fertile (sporedust white). Stem whitish, 2—3 cm. \times 3—5 mm.

Fig. spec. (D. A. pl. 921): Stenløse, frondose copse, on *Russula densifolia*, Aug. 28. 1917. — This form almost equals *N. nauseosa* Weinm., but hardly deserves a specific name.

3. *N. parasitica* (Bull.) Fr.

Diagn.: Cap 0.4—1.5 cm., campanulate, expanded, whitish, with a flush of grayish lilac, silky, submembranaceous. Gills narrow irregularly adfixed or decurrent with a tooth, pallid. Stem slender, thin (1—2 mm.), white. Clustered or fasciculate.

Spores hyaline, subspheric-oval, $5-5\frac{1}{2} \times 3-3\frac{3}{4} \mu$. Basidia 4-spored. Chlamydospores oval, thick-walled, $15 \times 9 \mu$ (membrane about $1\frac{1}{2} \mu$), pale brownish.

Fig. spec. (D. A. pl. 922): Langesø Nordskov (on *Russula delica*), Sept. 12. 1912. Not uncommon in certain years. Also found on *Rus. adusta*.

Besides these two cosmopolitan species I have met with a very peculiar little agaric which with some reluctance I refer to this genus.

Diagn.: Small. Cap 0.8 cm., submembranaceous, somewhat Marasmioid, at last flat, ash-gray, darker in the middle, slightly rugulose, densely powdery-granulate. Gills whitish, rather narrow (1 mm.) and thin, linear-lanceolate, distant, attenuato-adsnate. Stem central, pale ashy-gray, short, densely white-powdered, 1 mm., thick not hollow, rather brittle. Sporepowder white. Smell 0.

Spores almost spheric, spinulose 5μ . Basidia clavate, 6—7 μ broad with 4 (3) sterigmata. Cystidia awlshaped, their free portion $35-38 \times 6-12 \mu$. Surface of cap clad with conidioid, elliptical-lanceolate cells, $12 \times 5 \mu$.

Not figured. Hjallesø, a single specimen on a very rotten mouldy stump of *Populus*, Nov. 1897.

Is this *N. cryptarum* (Secr.) Sacc.? — *Laccaria nana* Masee differs principally by having much larger spores. — I have never met this odd little fungus again.

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Explanation of Plate.

| | | | | |
|----------------|-----------------------------------|-----------|-------|---------------------------|
| a ₁ | <i>Tricholoma guttatum</i> | (Barla) | | Fruitbody. |
| a ₂ | — | — | | Section. |
| a ₃ | — | — | ..... | Spore. |
| b ₁ | <i>Leutinus bisus</i> | (Quél.) | ..... | Fruitbody with tall stem. |
| b ₂ | — | — | ..... | with sublateral stem. |
| b ₃ | — | — | ..... | Spore. |
| c ₁ | <i>Tricholoma bisporigerum</i> | Lange | ..... | Fruitbody. |
| c ₂ | — | — | ..... | Section. |
| c ₃ | — | — | ..... | Spore. |
| c ₄ | — | — | ..... | Basidium. |
| d ₁ | <i>Nyctalis asterophora</i> | Fr. major | ..... | Fruitbodies. |
| d ₂ | — | — | ..... | Section. |
| d ₃ | — | — | ..... | Chlamydospore. |
| d ₄ | — | — | ..... | Basidiospore. |
| e ₁ | <i>Tricholoma putidum</i> | Fr. | ..... | Fruitbody, dry. |
| e ₂ | — | — | ..... | Fruitbody, watersoaked. |
| e ₃ | — | — | ..... | Section. |
| e ₄ | — | — | ..... | Spore. |
| f ₁ | <i>Tricholoma pseudo-Flammula</i> | Lange | | Fruitbodies. |
| f ₂ | — | — | | — |
| f ₃ | — | — | | Section. |
| f ₄ | — | — | | Spore. |



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