Art. XXVIII.—*The Fungus Flora of New Zealand.*

By George Massee, F.L.S., F.R.M.S., Principal Assistant (Cryptogams), Royal Herbarium, Kew.

Communicated by Sir J. Hector.

[*Read before the Wellington Philosophical Society, 20th September, 1898.*]

Plates XXII.–XXIV.

The last complete enumeration of New Zealand Fungi is contained in the "Handbook of the New Zealand Flora." Since the publication of this work, in 1864, many hundreds of Fungi have been received at Kew for identification, communicated by the Rev. William Colenso, F.R.S., F.L.S. Out of these, many proved to be undescribed species, while numerous others had not previously been recorded from New Zealand.

As an illustration of the numerous additions to the Flora, it may be mentioned that in the Handbook thirty-three species belonging to the *Agaricineæ*, or gill-bearing Agarics, are recorded, whereas at the present day no fewer than one hundred and thirty-two species are known. An equal increase in numbers is also true of the other groups of Fungi.

Under the circumstances, it is considered that the study of mycology in New Zealand would be facilitated by indicating what has already been done, and in giving diagnoses of all indigenous species. Apart from the purely scientific side of the subject, it is absolutely essential, from an economic standpoint, that a sound knowledge of the numerous destructive parasitic species should be possessed by those whose duty it is to superintend and advise on the best means of protecting the vegetable products of the country from their attacks.

The Nature of Fungi.

The amount of evidence possessed at the present day favours the idea that the Fungi have descended in a direct line from the Algæ, and, by gradual differentiation and adaptation to a life on dry land, have at some distance from the point of departure from the parent stock gradually acquired a set of characteristics which collectively give an individuality to the group. On the other hand, the Fungi are strictly a terminal group—in other words, there are no indications of a departure, either morphologically or physiologically, from the Fungi that suggest the starting-point of a new order of things. The mutualism between Fungi and Algæ that has resulted in the production of the group of plants collectively known as

Lichenes cannot be considered in the sense of being a branch from the fungal stock, and must have come into existence long after the complete differentiation of the Fungi was effected, because the fungal element in lichens corresponds to the ascigerous Fungi, *Sphæriaceæ* and *Discomycetes*, which do not belong by any means to the earliest differentiated groups of Fungi.

The bulk of Fungi with which people generally are most familiar are truly terrestrial, belonging to sections that have ages ago forsaken the aquatic home of their ancestors; nevertheless, numerous truly aquatic Fungi do still exist, and such, as would be expected, are morphologically most in touch with the Algæ. As an example of such algal-like Fungi, as they are termed by Brefeld, may be mentioned the *Saprolegniæ*, which morphologically, and in the sexual mode of reproduction, closely agree with such Algæ as *Vaucheria*. These primitive Fungi also agree with some of the Algæ in possessing a unisexual, as well as a sexual, mode of reproduction, and one feature that has been constantly kept in view in the evolution of the Fungi, and to which they owe to a great extent their individuality as a distinct group of organisms at the present day, is the gradual suppression of the sexual mode of reproduction, and the proportional elaboration of the asexual method, until finally, in the most highly evolved and at the same time the most modern section of the Fungi, the *Basidiomycetes*, the sexual mode of reproduction has completely disappeared, and so dissimilar are the components of this group, including the numerous forms popularly known as mushrooms, toadstools, puffballs, &c., to the Algæ that, but for the connecting-links still existing in an almost unbroken chain, their origin would certainly never have been suggested.

The only observable difference between the Algæ and those Fungi most closely related consists in the suppression of chlorophyll in the latter—a condition which necessitated a change in the mode of life: the Fungi, being unable to assimilate inorganic food, became parasites, obtaining their food from living organisms—plants or animals; or saprophytes, obtaining their food from dead and decaying organic matter.

The early groups of Fungi include numerous parasitic species, whereas in the later, or more modern, groups saprophytic species are most abundant. Numerous species can only live, through their entire life-cycle, as parasites, and are termed "obligate parasites," as the members of the *Uredineæ*, commonly known as "rusts," the destructive parasites of cereals, &c.; others possess the power of living as saprophytes and parasites respectively at different periods of their existence, and are called "facultative parasites."

The supposed rapidity with which Fungi spring up, mature their spores or reproductive bodies, and disappear has become proverbial—at least in the Northern Hemisphere. Nevertheless, such an idea is a mistake. The part popularly considered as constituting the entire fungus—that is, the part appearing outside the matrix on which the fungus is growing—is only a part of the organism, corresponding functionally to the fruit of a flowering-plant, and is solely concerned with the continuation of the species; whereas the vegetative portion of the fungus—the portion upon which the continuation of the individual depends—is always buried in the substance upon which the fungus is growing. If we take as an example any ordinary mushroom or toadstool, we find a weft of slender threads forming the vegetative portion, known as mycelium, or spawn, permeating the matrix or substance on which the fungus is growing. On this mycelium the sporophores, or spore-producing portions, first appear as minute white lumps, not a millimetre in diameter. These continue to increase in size, and become differentiated into pileus, or cap, stem, gills, &c., while yet underground; and finally, when the structure is completely elaborated, it pushes up above the surface of the matrix, for the purpose of having its spores dispersed by wind or other agents.

In the majority of Fungi the very minute spores are dispersed by currents of air; in many of the subterranean Fungi animals, especially rodents, scratch up the Fungi, which they eat, and probably the spores pass through the alimentary canal uninjured, and are thus dispersed. Finally, in one group of Fungi—the *Phalloideæ*—brilliant colours, combined with a powerful smell, attract insects, which readily feed on a sweet, semi-liquid substance, containing the minute spores in suspension, which are thus disseminated. It is interesting to note that colour and smell, the agents used by many flowering-plants for the purpose of advertising their whereabouts to insects, which, in return for a supply of nectar, unconsciously effect cross-fertilisation, should be utilised by some Fungi for the purpose of securing spore dissemination.

As previously stated, many Fungi have two or more different modes of reproduction. This is especially observable in the instance of destructive parasites, or, in other words, this arrangement enables certain species to act as wide-spreading and injurious pests to cultivated crops. The process is as follows: In species parasitic on annual plants, as cereals, the fungus continues to produce, in rapid succession, innumerable asexually formed conidia, or reproductive bodies, which possess the power of germinating the moment they are mature. These conidia are washed by rain or carried by wind on to the surface of healthy leaves, where they germinate at once, enter

the tissues, and within a very short time form a new centre of disease, producing conidia, which in turn are dispersed and extend the disease.

From the above account it may be seen how quickly a disease can spread when it has once gained a foothold in places where the host-plant is in considerable numbers and close together, as in a field of corn, in an orchard, forest, &c. These conidia are known as summer-spores, their special function being to enable the fungus to extend its geographical area.

Towards the end of the season, when the vitality of the host-plant is on the wane, the same mycelium which produced conidia, or summer-spores, now gives origin to a different form of fruit, known as resting-spores or winter-spores. These spores remain in a passive or resting state until the following season, and germinate at the time when the host-plant is pushing into active life. The function of the resting-spore condition is to secure the continuation of the species, by tiding it over that portion of the year when the host-plant is not in active growth.

In addition to the production of resting-spores, the mycelium of many species of Fungi becomes concentrated into a number of compact masses or nodules, called "sclerotia," usually of a black colour externally. These sclerotia, which vary in size in different species from that of a pin's head to a cricket ball, also remain in a quiescent state during the winter, in the tissues of the leaves or stem where they are formed, or in the ground, and in the following spring produce reproductive organs, which infect the young leaves of the host-plant, and commence anew the cycle of development.

From the above account it will have been gathered that resting-spores, or sclerotia, give origin to the disease in the first instance by inoculating the host-plant, the spread of the pest being afterwards secured by the rapid production of summer-spores. Although the leaves or stems bearing resting-spores or sclerotia may completely decay during the winter, the reproductive parts of the fungus do not perish, but remain lying on the ground until the host again makes its appearance, and then act as already described. The resting-spores on the straw of cereals do not fall away readily. The corn may be harvested, the straw used for fodder, pass on to the manure-heap, be returned to the land as manure, and yet the resting-spores may be found attached to fragments of the decaying straw, and quite capable of germination. Finally, resting-spores and sclerotia often possess the power of remaining in a dormant condition for several years, thus extending the means for continuing the struggle for the survival of the fittest, often much to the disadvantage of the farmer and horticulturist.

It has been estimated that damage to the extent of fifty millions of pounds annually is caused by parasitic Fungi alone to cultivated crops, and it is also equally certain that the greater part of this damage could be prevented if proper precaution was exercised. This precaution can only be carried into effect when a sufficient number of experts are available for the purpose of imparting information directly to those most immediately concerned.

Classification.

There are at the present day about forty-five thousand accepted species of Fungi. These numbers are in future much more likely to be reduced than increased, as many forms accepted at the present day as entities will certainly prove to be simply forms in the life-cycle of other species. Nevertheless, we have an enormous assemblage of undoubted species, and the grouping of these into natural families has engaged the attention of several of our most able mycologists. Notwithstanding the brilliant discoveries made during the last half-century, important fundamentals are far from being satisfactorily settled. For example, as regards the important point relating to sexual reproduction, the three observers who have paid most attention to the subject—De Bary, Brefeld, and Dangeard—have arrived at conclusions diametrically opposed to each other, and, as all cannot be right, the question is still open. Under the circumstances, it is considered advisable, in a purely systematic work, to adopt a classification which enables the student to determine a species with the greatest possible facility; its peculiarities—morphological, physiological, &c.—can afterwards be obtained from special works devoted to that branch of the subject, experience having taught that all attempts to weave such details into a work dealing entirely with the discrimination of species has resulted in failure.

The following works give the result of biological research into the life-history of the Fungi:—

"Vergleichende Morphologie der Pilze" (Dr. F. von Tavel); 90 figs. Jena, 1892.—This contains a condensed account of the whole of Brefeld's investigations on the life-history of the Fungi.

"Introduction to the Study of Fungi" (Dr. M. C. Cooke); numerous figs. 1895. Black and Co. 18s.—Contains a general sweeping-up of all recent works on Fungi; especially valuable for geographical distribution and broad features of the various groups.

"Plant Life" (G. Massee); figs. 1890. Methuen and Co. 2s. 6d.—An introduction to the study of cryptogamic botany.

BASIDIOMYCETES.

Naked spores borne on basidia; basidia closely packed side by side to form a continuous spore-bearing surface, or hymenium, which may be exposed from the first, or concealed until the spores are mature. Sexual reproduction absent.

The *Basidiomycetes* are divided into two primary groups, as follows:—

1. HYMENOMYCETES.

Hymenium exposed from the first, or at an early stage of development, and before the spores are mature.

2. GASTROMYCETES.

Hymenium concealed within a continuous membrane or peridium until the spores are mature.

HYMENOMYCETES.

The *Hymenomycetes* are divided into the following families:—

I. AGARICINEÆ.

Hymenium covering radiating gills or lamellæ.

II. POLYPOREÆ.

Hymenium lining the walls of pores or tubes.

III. HYDNEÆ.

Hymenium covering slender spines, teeth, or granular warts.

IV. THELEPHOREÆ.

Hymenium covering a smooth or very slightly irregular surface.

V. CLAVARIEÆ.

Hymenium spread over club-shaped or much-branched, erect sporophores.

VI. TREMELLINEÆ.

Sporophore entirely gelatinous, hymenium covering its entire surface.

AGARICINEÆ.

The most highly differentiated of the *Hymenomycetes*, characterized by having the hymenium spread over thin, radiating gills or lamellæ. The general structure consists of the pileus, or cap (Plate XXII., fig. 6*d*), bearing the gills on its under-surface, and supported by a stem. In the most highly evolved forms the entire fungus is enclosed when quite young in a continuous sheath or universal veil (Plate XXII., figs. 4, 5), which becomes ruptured during growth, the upper

portion being often carried up by the pileus and torn into patches or warts as the pileus expands (Plate XXII., fig. 6*b*). The lower portion of the universal veil remains as a sheath round the base of the stem, and is known as a volva (Plate XXII., fig. 6*a*). A partial veil is present in some species, which, in the young stage of the fungus, forms a membrane extending from the upper part of the stem to the margin of the pileus (Plate XXII., fig. 12*a*), thus concealing the gills. As the pileus expands the veil separates from the margin or edge of the pileus, shrinks up, and forms a ring or annulus round the stem (Plate XXII., fig. 6*c*). In some species both primary and secondary veils are present; in some forms one or other may be absent, and in the majority of species both are absent from the first.

The pileus is regular when its form is symmetrical, and the gills radiate equally on all sides from its centre; excentric when the gills radiate from an excentric point (Plate XXII., fig. 7); dimidiate when the stem is absent or nearly so, and the pileus is attached laterally, and projects horizontally from its point of attachment (Plate XXII., fig. 10); sessile when the stem is entirely absent; resupinate when the pileus is attached to the substance on which it is growing, and the gills necessarily point upward, as in primitive types (Plate XXII., fig. 10); umbonate when there is a rather pointed projection or boss in the centre or apex of the pileus (Plate XXII., fig. 8*a*); gibbous when the boss is broader and blunter than in the umbonate type (Plate XXII., fig. 9*a*); umbilicate when there is a small dimple at the apex of the pileus (Plate XXII., fig. 2*a*); infundibuliform when the pileus is depressed like a funnel (Plate XXII, fig. 1*a*); striate when evenly and slightly fluted for some distance up from the margin (Plate XXIV., fig. 7); sulcate when the ridges are stronger than in the striate type. Many terms, such as "convex," "campanulate," "warted," "glabrous," "viscid," "scaly," &c., are self-explanatory.

The genera of the *Agaricineæ* are founded to a great extent on the mode of arrangement and structure of the gills. When the gills are grown to the stem, down which they extend for some distance, thinning out to a narrow point, they are said to be decurrent (this is the most primitive type) (Plate XXII., fig. 1*b*); adnate when the gills are attached to the stem by their entire breadth, but do not run down the stem (Plate XXII., fig. 2*b*); adnexed when the gills are slightly rounded off where they touch the stem, so that they only grow to the stem by about half their entire width (Plate XXII., fig. 8*b*); sinuate when the gill is cut out in a curved manner close to the stem, to which it grows only by a small portion of its width (Plate XXII., fig. 9*b*) (sinuate differs from

CORRIGENDA

In Mr. Massee's Article XXVIII., on "The Fungus Flora of New Zealand."

Page 289, line 6. *Insert a comma after* thickened.
Page 289, line 19. *Insert a comma after* fibrous.
Page 291, line 14 from bottom. *For* fimetarius *read* fumitarius.
Page 292, line 8. *For* 0·7 *read* 12.
Page 293, line 6 from bottom. *Delete* primrose.
Page 301, line 2. *For* purpureo-nitens *read* sapinea.
Page 301, line 5 from bottom. *Insert* vol. ix., p. 115.
Page 307, line 16 from bottom. *For* crinacea *read* erinacea.
Page 309, line 17. *For* Eleuch *read* Elench.
Page 349, line 3. *For* plant *read* pileus.

NOTE.—A proof was sent to the author in England, and these corrections were supplied by him, but were received too late for insertion.

[To face p. 289

adnate in the presence of an evident notch where the gill joins the stem); free when the gills are completely rounded off behind, so that they do not reach the stem (Plate XXII., fig. 11). Attention must be paid to the edge or margin of the gill, as to whether it is entire, minutely toothed or serrated, thin or acute, thickened or split. If a very thin section of a gill is examined under the microscope it will present something of the appearance shown in Plate XXIV., fig. 3, where *a* is the trama, or central portion, which is a continuation of the hyphæ forming the flesh of the pileus; branches of the hyphæ of the trama give origin to the basidia (*b*), also to numerous other bodies not bearing spores, and termed "paraphyses" (*c*). In addition to these two structures, basidia and paraphyses, which are always present in the hymenium, certain other bodies, of larger size and projecting above the basidia, are present in certain species, and are called "cystidia" (*d*).

The special points connected with the stem are position—as to whether central or excentric, solid or hollow, presence or absence of ring or volva, fibrous or cartilaginous and polished externally. Finally, the following features should be noted as essentials in the discrimination of species: Dry or viscid, smooth, scaly, or fibrous texture of pileus or stem; presence or absence of smell or taste, the latter, when present, sometimes very pleasant, at others intensely pungent, especially in the genus *Lactarius*, which is characterized by the presence of latex, or milk, which escapes from the broken tissues as a thick, white, or variously coloured liquid, in many instances of a very pungent nature. so that a minute portion on the tongue causes a burning sensation, which lasts for some little time.

In the general evolution of the *Agaricineæ* the species with decurrent gills are the lowest and most ancient type; next come species with adnate gills, followed by those having adnexed gills; while, finally, the species with free gills are last to appear in the scheme of development, and are most perfectly adapted for surviving in the general struggle, as proved by superiority in numbers and wide geographical range. In addition to the above structural sequence of development, the *Agaricineæ* further evolved a sequence of five groups depending on the colour of the spores. The oldest in time, and structurally the most primitive, have black spores; next follows a series with purple-brown spores, followed by a third series having rust-coloured or ochraceous spores; the fourth series has salmon-coloured or pink spores, while the last and newest in order of time has white spores. In each of these spore-colour groups the original sequence of the position of gills is repeated—that is, we have genera with free gills, for instance, in each of the colour-groups, and so on. The signi-

ficance of this sequence of development cannot be discussed here. Those interested in the subject will find an explanation in the Journal of the Quekett Microscopical Club (ser. 2, vol. 7; April, 1898).

The spores of all fungi are colourless when young, the characteristic colour they eventually possess being developed in the wall of the spore just before maturity. When the colours of spores are spoken of, the colour of the mass of spores as seen by the naked eye when deposited on paper is intended. To obtain spores in this way, cut off the stalk of an agaric close to the pileus, place the pileus, gills downwards, on paper, and after a few hours a copious deposit of spores will take place. If the pale gills suggest white spores use black paper, if dark spores use white paper.

I. Melanosporæ.

Spores black; gills dark-coloured at maturity, speckled with the black spores. No tinge of purple present.

II. Porphyrosporæ.

Spores purplish-black; gills blackish or brown, with a purple tinge at maturity.

III. Ochrosporæ.

Spores ochraceous, brown, or bright rust-colour; gills at maturity ochraceous, brownish, or rusty orange. No tinge of purple present.

IV. Rhodosporæ.

Spores salmon-colour or pinkish; gills salmon-colour or rosy at maturity.

V. Leucosporæ.

Spores white; gills in most species white at maturity. In some species the gills are yellow or grey, but the permanently white spores determine the group.

Melanosporæ.

Analysis of the Genera.

* *Gills deliquescing into a black fluid at maturity.*

1. Coprinus.

** *Gills not deliquescing, pileus not striate.*

2. Anellaria. Stem with a ring.
3. Panæolus. Stem without a ring.

*** *Gills not deliquescing, pileus striate.*

4. Psathyrella.

1. **Coprinus,** Pers.

Pileus regular, thin, often striate; gills free or variously attached, never decurrent, whitish at first, becoming black with the spores, deliquescing at maturity; stem central, sometimes with a volva and ring; spores black.

Coprinus, Persoon, Syn. Fung., p. 395 (as a section of *Agaricus*).

Distinguished from allies by the deliquescence of the gills at maturity, which become converted into a dripping mass of inky-black fluid. The pileus also disappears very quickly. Growing on dung, or rich soil, sometimes round stumps, posts, &c.; usually clustered.

1. *Coprinus comatus*, Fries, Epicr., p. 242; Massee, Brit. Fung.-Flora, i., p. 305, fig. 1, p. 303; Austr. Fung., p. 68; Sacc., Syll. v., no. 4375.

Pileus cylindrical, then campanulate, finally expanding and deliquescing, at first even; during growth and expansion the cuticle becomes torn into broad adpressed or loose scattered scales, cream-colour, interstices white and silky, 7–12 cm. high; flesh white, thin except at the apex; gills almost free, about 1 cm. broad, crowded, white, then pinkish, at length black; spores almost black, elliptical, 13–18 × 7–8 μ; stem 18–16 cm. high, 1–2 cm. thick, subequal, white, even, hollow, more or less bulbous, bulb solid; ring movable on the stem, soon disappearing.

Amongst grass, in pastures, waste places near towns, &c.; not on dung. Northern Island, New Zealand. Australia, Europe, United States.

A large, fine species, growing in troops, readily distinguished by its large size and cylindrical form of the whitish shaggy pileus. One of the best and safest of edible fungi.

2. *Coprinus fimetarius*, Fries, Epicr., p. 245; Hdbk. N.Z. Flora, p. 604; Austr. Fung., p. 68; Sacc., Syll. v., no. 4404.

Pileus clavate, then conico-expanded, soon split and upturned, greyish, apex tinged with brown, covered at first with white floccose scales, then naked and coarsely grooved, 2·5–5 cm. across, disc even, flesh thin; gills free, lanceolate, narrow, wavy, black; spores 12–14 × 7–8 μ; cystidia large, numerous; stem 10–15 cm. long, white, apex downy, squamulose below, hollow except the thickened base.

On manure-heaps, dung, &c. Canterbury Province, Middle Island, New Zealand. Australia, Europe, Siberia, United States.

Solitary, or usually clustered, soon splitting, curling up

and deliquescing into a black, dripping liquid, leaving the stems standing.

3. *Coprinus colensoi*, Berk., Flora N.Z. ii., p. 175; Hdbk. N.Z. Flora, p. 604; Sacc., Syll. v., no.

Pileus cylindrical, obtuse, then campanulate, very thin, covered with snow-white scurfy meal, below the meal greyish and slightly striate, $\frac{1}{2}$–$\frac{3}{4}$ cm. high; gills narrow, black; spores blackish-brown, elliptic-oblong, 0·7 μ long; stem 1·5–4 cm. long, slender, tomentose, white.

On dung; subfasciculate. Northern Island, New Zealand.

A pretty little endemic species, allied to *Coprinus niveus*, but smaller, and the pileus not so cottony in its covering or veil.

2. **Anellaria**, Karsten.

Pileus slightly fleshy, regular, smooth and even; gills adnexed, slate-grey, becoming variegated with the black spores; stem central, ring present when young, either persistent or forming a zone round the stem; spores black.

Anellaria, Karsten, Hattsvamp., i., p. xxv.

Separated from the genus *Panæolus* on account of the presence of a more or less definite ring on the stem. Growing on dung or richly manured ground.

4. *Anellaria separata*, Karsten, Hattsv., i., p. 517; Sacc., Syll. v., no. 4560; Brit. Fung.-Flora, i., p. 330, figs. 2–5, p. 330. *Agaricus separatus*, Linn., Suec., no. 1220.

Pileus ovate, then campanulate, very obtuse, not expanding, viscid, even, ochraceous, then whitish, shining, often somewhat rugulose, 2–4 cm. high and wide; flesh thin, white; gills adnexed, ascending, thin, crowded, broad, greyish-black, margin paler; spores broadly elliptic-fusiform, black, opaque, $10 \times 7\ \mu$; stem 6–14 cm. long, straight, base somewhat clavate, narrowed upwards, whitish, shining, apex slightly striate; ring persistent, distant (from the apex).

On dung. New Zealand. South Africa, Europe, Argentine Republic.

Variable in size, sometimes quite small, but readily distinguished by the pale, ochraceous, viscid pileus, which becomes whitish and wrinkled when old, and the long, straight stem bearing a persistent, almost median, ring.

5. *Anellaria fimiputris*, Karsten, Hattsv., i., p. 518; Sacc., Syll. v., no. 4561; Brit. Fung.-Flora, i., p. 331. *Agaricus (Panæolus) fimiputris*, Austr. Fung., p. 66.

Pileus submembranaceous, conical, then expanded, with an indication of a broad umbo, even, viscid, smoky-grey,

pale dingy ochraceous when dry, 2·5–5 cm. broad; gills adnate, 4–6 mm. broad, greyish-black, margin the same colour; spores elliptical, apiculate, 9–10 × 6 μ; stem 6–12 cm. high, about 4 mm. thick, often rather flexuous, equal, smooth, pallid, hollow; ring imperfect, usually only indicated by a pale zone round the stem above the middle.

On dung, &c. New Zealand. Australia, Europe, United States.

Solitary, gregarious, or clustered. Differs from *Anellaria separata* in colour, and in the very imperfect ring, and in this last character connects the genera *Anellaria* and *Panæolus*. Differs from *Coprinus* in the gills not being deliquescent.

3. **Panæolus,** Fries.

Pileus regular, rather thin, never striate, margin extending beyond the end of the gills; gills adnexed, grey, then mottled with the black spores; stem central, without ring or volva; spores black.

Panæolus, Fries, Epicr., p. 234 (as a subgenus of *Agaricus*).

Distinguished amongst the *Melanosporæ* by the even, non-striate pileus, and the absence of ring and volva on the stem. In *Psathyrella* the pileus is striate, and the gills black, not mottled; in *Anellaria* there is a ring on the stem, whereas in *Coprinus* the gills deliquesce into a black, inky liquid at maturity. Growing on dung or richly manured ground.

6. *Panæolus papilionaceus*, Fries, Epicr., p. 136; Austr. Fung., p. 67; Sacc., Syll. v., no. 4547.

Pileus slightly fleshy, almost exactly hemispherical, obtuse, even, glabrous, the cuticle often becoming broken up into minute squamules when dry, pale-grey, with a tinge of rufous, especially at the disc, 1·5–2·5 cm. across; gills broadly adnate, very broad, up to 6 mm., plane, at length blackish with the spores; spores elliptical, 11–12 × 7 μ; stem 6–10 cm. long, 4 mm. thick, equal, smooth, whitish, apex powdered with white meal, hollow.

On dung, manured ground, &c. New Zealand. Australia, Ceylon, Europe, Siberia, Central Africa, United States.

Distinguished from some closely allied species—not yet met with in New Zealand—by the obtuse hemispherical pileus, broadly adnate broad gills; and whitish stem, powdered with white primrose meal at the apex.

4. **Psathyrella,** Fries.

Pileus regular, thin, striate, margin straight and pressed to the stem when young, not extending beyond the end of the gills; gills free or adnexed, not deliquescent; stem central; spores black.

Psathyrella, Fries, Epicr., p. 237 (as a subgenus of *Agaricus*).

Structurally most closely allied to *Psathyra*, a genus included in the *Porphyrosporæ*, but in the latter the purplish-brown colour of the spores is distinctive. Growing on the ground.

7. *Psathyrella disseminata*, Pers., Syn., p. 403 (1801); Cke., Hdbk. Austr. Fung., p. 68; Sacc., Syll. v., no. 4597.

Densely tufted. Pileus about 1 cm. across, membranaceous, ovate-campanulate, at first scurfy then naked, coarsely striate, margin entire, yellowish-tan, then grey; gills adnate, narrow, whitish, then grey, finally blackish; spores elliptical, 6–10 × 3–5 μ; stem 2–4 cm. long, very slender, almost equal, rather curved, mealy then smooth, fragile, hollow.

About trunks and stumps, and on the ground. New Zealand. Victoria, Queensland, Western Australia, Tasmania, Ceylon, South Africa, Europe, Siberia.

Forming large, dense tufts; very slender and fragile, soon flaccid, but not deliquescent.

Porphyrosporæ.

Analysis of the Genera.

* *Gills attached to the stem.*

† Ring imperfect or absent.

5. Hypholoma.

†† Ring perfect on the stem.

6. Stropharia.

** *Gills free from the stem.*

7. Agaricus.

5. **Hypholoma**, Fries.

Pileus regular, fleshy, margin incurved when young; gills adnate or adnexed and sinuate; stem central, veil cobweb-like, not forming a distinct ring, after rupture attached in fragments to margin of pileus; spores purple-brown.

Hypholoma, Fries, Syst. Myc., i., p. 287 (as a subgenus of *Agaricus*).

Mostly tufted and growing on wood, buried roots, &c. Distinguished from *Stropharia* by the absence of an interwoven complete ring on the stem. When a trace of a ring is present it is in the form of delicate fibres, and very scanty.

Hypholoma agrees in structure with *Hebeloma*, *Entoloma*, and *Tricholoma*. On wood, or clustered on or around stumps; often clustered.

8. *Hypholoma appendiculatum*, Bull., Champ. France, pl. 392; Flora N.Z., ii., p. 175; Hdbk. N.Z. Flora, p. 604; Sacc., Syll. v., No. 4214.

Pileus ovate, then widely campanulate, glabrous, bay-brown when young and moist, becoming white with an ochraceous tinge, wrinkled and rather atomate when dry, 4–7 cm. across, the remains of the veil often forming an irregular fringe to the margin of the pileus when young; flesh thin; gills adnexed, crowded, dry, rather narrow, whitish, then pinkish, at length brown; spores elliptical, 5 × 2·5 μ; stem 4–7 cm. long, 5–6 mm. thick, equal, glabrous, apex mealy, white, hollow.

In tufts, on trunks, stumps, &c. Northern Island, New Zealand. Europe, South America.

A closely allied species, *H. candolleanus*, not yet recorded for New Zealand, is distinguished by having the gills pale-violet at first.

9. *Hypholoma fasciculare*, Huds., Flora Angl., p. 615; Flora N.Z., ii., p. 175; Hdbk. N.Z. Flora, p. 603; Austr. Fung., p. 62; Sacc., Syll. v., no. 4178.

Densely clustered, bitter; pileus bluntly campanulate, then expanded and somewhat umbonate, glabrous, even, tawny, margin yellowish, 2·5–5 cm. across; flesh thin, yellow; gills adnate, crowded, narrow, pale-yellow, then greenish, clouded with the dark spores, inclined to deliquesce at maturity; spores elliptical, 7 × 4 μ; stem 6–10 cm. long, 4–6 mm. thick, yellow, fibrillose, hollow, often more or less curved.

On old stumps, &c. Northern Island, New Zealand. Australia, Tasmania, Europe, Ceylon, Natal.

Distinguished by the densely crowded habit, bitter taste, and greenish gills. Poisonous. *Flammula inopoda* somewhat resembles the present species, but differs in the long rooting base of the stem and the absence of a bitter taste.

10. *Hypholoma stuppeum*, Berk., N.Z. Flora, ii., p. 175; Hdbk. N.Z. Flora, p. 604 (as *Agaricus (Hypholoma) stuppeus*); Sacc., Syll. v., no. 4195.

Pileus convex, then expanding until almost plane, rather fleshy, tawny or brownish, shaggy, especially towards the margin, with spreading, crowded, pointed scales, each consisting of a fascicle of hyphæ, 4–6 cm. broad; gills adnexed, crowded, thin, umber-brown; spores obliquely pip-shaped, brownish, 7 × 4 μ; stem 2–3 cm. long, nearly 1 cm. thick, fibrillose, becoming smooth, thickened at the base, and attached to the soil by a copious development of mycelium.

On the ground. New Zealand.

Allied to the European species *Hypholoma velutinus*, *H. lacrymabundus*, and *H. pyrotrichus*, but differing from all in the tomentum of the pileus being in the form of shaggy, fibrous scales. Type specimen examined.

6. **Stropharia,** Fries.

Pileus regular, fleshy, often covered with a viscid pellicle; gills adnate or adnexed, becoming purplish-brown at maturity; stem present, round which the veil forms a distinct ring; spore purplish-brown.

Stropharia, Fries, Monogr., i., p. 408 (as a subgenus of *Agaricus*).

Distinguished amongst the *Porphyrosporæ* by the presence of a distinct ring on the stem in conjunction with attached gills. *Stropharia* corresponds with *Pholiota* and *Armillaria*. Growing on dung or rich ground.

11. *Stropharia semiglobata*, Fries, Syst. Myc., i., p. 291; Hdbk. N.Z. Flora, p. 603; Austr. Fung., p. 62; Massee, Brit. Fung.-Flora, i., p. 404, fig. 17, p. 351; Sacc., Syll. v., no. 4151.

Pileus persistently hemispherical, obtuse, even, viscid, pale-yellow, 1·5–3 cm. across; flesh thin, white; gills broadly adnate, up to 1 cm. broad in larger specimens, margin straight, greyish, clouded with the dark spores, rather close together; spores 12 × 6 μ; stem 6–12 cm. high, 3–5 mm. thick, equal, glabrous, viscid, yellowish, hollow, ring imperfect, inferior, soon stained with the dark spores.

On dung. Middle Island, New Zealand. Australia, Tasmania, South Africa, Europe, Siberia, United States.

Distinguished by the hemispherical viscid pileus and broad gills. In very large vigorous specimens the pileus sometimes becomes plano-convex. Poisonous.

7. **Agaricus,** L. (emended).

Pileus regular, fleshy; gills free from the stem, whitish at first, finally dark-umber; stem central, furnished with a ring; spores brownish-purple.

Agaricus, L., Syst. Nat. (1735) (in part).

Distinguished by the free gills and ring on the stem. The *Agaricus* of Linnæus, as interpreted by Fries, was divided into several subgenera by the last-named author, and the original name *Agaricus* has been retained for those species included in the subgenus *Psalliota* of Fries. *Agaricus* as here understood is morphologically similar to *Lepiota* in the *Leucosporæ*. All grow on the ground; often in open pastures.

12. *Agaricus arvensis*, Schæffer, Icon., t. 310, 311; Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 603; Austr. Fung., p. 60; Sacc., Syll. v., no. 4039.

Pileus bluntly ovate, then expanded and slightly convex, slightly mealy at first, white and silky, becoming stained pale-

yellow when bruised, 10–25 cm. across; flesh thick at the disc, becoming thin towards the margin, yellowish when cut; gills free, broadest in front, rather crowded, whitish, then reddish-brown; spores elliptical, 6 × 4 μ, stem stout, 7–12 cm. high, rather swollen at the base, almost cylindrical above, white, smooth, even, soft in the centre and filled with loose fibres; ring pendulous, double, the outer membrane more or less torn.

In pastures, &c., often growing in rings. Northern Island, New Zealand. Australia, Tasmania, South Africa, Ceylon, Europe.

Closely allied to *Agaricus campestris*, but known by the pileus becoming yellow when bruised, and the flesh of pileus and stem not changing to brown when cut. Smell strong and pleasant. Edible; preferred by many to the mushroom (*A. campestris*). In large specimens the pileus is sometimes cracked or scaly, and brownish when old.

13. *Agaricus campestris*, Linn., Suec., no. 1205; Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 603; Austr. Fung., p. 60; Sacc., Syll. v., no. 4053.

Pileus globose, then expanding until plano-convex, dry, silky, floccose, or broken up into squamules, whitish, sometimes tinged brown, 6–15 cm. broad; flesh thick at the disc, margin thinner, becoming reddish-brown when cut, as does also that of the stem; gills free, but close to the stem, pale-pink, then flesh-colour, finally blackish-brown, inclined to deliquesce at maturity; spores 7–9 × 6 μ; stem 7–12 cm. long, stout, subcylindrical, white, stuffed; ring median on the stem, persistent, more or less torn.

In pastures, &c. Northern Island, New Zealand. A cosmopolitan species.

Edible. Known as the "mushroom" in Britain. (See note under *A. arvensis*).

14. *Agaricus campigenus*, Berk., Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 603; Sacc., Syll. v., no. 4102.

Pileus campanulate, rather fleshy, very obtuse, silky, with a few scattered scales, assuming a reddish hue when dry, about 2·5 cm. high; gills rather narrow, narrowed behind, adnexed or slightly adnate; spores pale red-brown, obliquely obovate; stem 4 cm. high, about 4 mm. thick, incrassated at the base, slightly furfuraceous, with a broadish ring near the top.

On the ground, among grass. New Zealand.

This has much the habit of a *Lepiota*, but the gills are adnexed and the spores pale but decidedly coloured (Berk.).

The type specimens are destroyed by insects, hence nothing can be added to the above information. If the gills are adnexed the plant cannot belong to *Agaricus* (the old *Psalliota*).

OCHROSPORÆ.

ANALYSIS OF THE GENERA.

* *Stem excentric, or absent.*

8. CREPIDOTUS.

** *Stem central, without a ring.*

† Gills decurrent.

9. TUBARIA. Gills triangular; veil absent.

10. FLAMMULA. Gills not triangular; veil present.

†† Gills adnate or adnexed.

11. GALERA. Margin of pileus not incurved when young.

12. NAUCORIA. Margin of pileus incurved when young; gills not sinuate.

13. HEBELOMA. Margin of pileus incurved when young; gills sinuate.

*** *Stem central, with a ring.*

14. PHOLIOTA.

8. **Crepidotus,** Fries.

Pileus excentric, often resupinate or attached laterally; gills more or less decurrent; stem excentric, lateral, or absent; spores rust-colour.

Crepidotus, Fries, Syst. Myc., i., p. 272 (as a subgenus of *Agaricus*).

Distinguished by the resupinate and sessile or excentrically stipitate pileus; many of the species are minute. *Claudopus* is the analogous genus in the *Rhodosporæ,* and *Pleurotus* in the *Leucosporæ.* Growing on dead wood.

15. *Crepidotus mollis,* Schæffer, t. 213; Austr. Fung., p. 58; Sacc., Syll. v., no. 3600.

Imbricated, horizontal; pileus obovate or reniform, flaccid, sessile, or with the posterior of the pileus narrowed into a strigose stem-like base, soft and flaccid, glabrous, pale dingy tan, then greyish, 3–7 cm. across; flesh rather gelatinous, soft; gills radiating from the point of attachment of the pileus, more or less decurrent, crowded, about 3 mm. broad, whitish, then watery cinnamon; spores elliptical, dingy brown, 8–9 × 6 μ.

On rotten trunks and stumps. Dannevirke, New Zealand. Australia, Borneo, Europe, United States.

When large the margin of the pileus is frequently more or less lobed or uneven. Remarkable for the soft consistency of the entire fungus.

9. **Tubaria,** W. G. Smith.

Pileus regular, thin; gills more or less decurrent, broadest behind, or near the stem, hence somewhat triangular; stem central, hollow; spores rusty.

Tubaria, W. G. Smith, Journ. Bot., 1870.

The species are small and delicate; known amongst the *Ochrosporæ* by the more or less decurrent, triangular gills. Corresponds in structure to *Eccilia* in the *Rhodosporæ*, and *Omphalia* in the *Leucosporæ*. Growing on the ground.

16. *Tubaria furfuracea*, Pers., Syn., p. 454; Austr. Fung., p. 57; Sacc., Syll. v., no. 3584.

Pileus rather fleshy at the disc, convex, then plane, margin spreading, at length depressed or umbilicate, yellowish-cinnamon, paler and hoary or silky-squamulose, due to the breaking-up of the cuticle when dry, 1·5–5 cm. across; gills adnato-decurrent, rather distant, about 3 mm. broad, cinnamon; spores elliptical, 10 × 6 μ; stem 2–5 cm. long, 2–4 mm. thick, rigid, usually paler than the stem, minutely flocculose, base surrounded with white down, hollow.

On twigs, chips, &c., lying on the ground. Dannevirke, New Zealand. Australia, Tasmania, Ceylon, Europe, United States, Brazil.

Distinguished by the cinnamon colour of every part when moist, becoming almost white when dry, and the surface being very minutely broken up into squamules.

17. *Tubaria inquilina*, Fries, Syst. Myc., i., p. 264 (1821); Cke., Hdbk. Austr. Fung.; Sacc., Syll. v., no. 3597.

Pileus 1–2 cm. across, membranaceous, convex, then plane, at length more or less umbonate, hygrophanous, glabrous, slightly viscid, striate when moist, livid brown, tawny or hoary tan when dry; gills slightly decurrent, very broad behind, triangular, rather distant, brownish-tan, then umber; spores elliptical, dusky ferruginous, 8 × 4 μ; stem about 2·5 cm. long, about 2 mm. thick, thinner towards the base, tough, bay, covered at first with whitish fibrils and with white down at the base, hollow, often flexuous.

On twigs, chips, &c., lying on the ground. New Zealand. New South Wales, Europe.

Closely allied to *Tubaria crobula;* smaller, pileus striate when moist, glabrous from the first, and stem soon glabrous are the principal distinctive features.

18. *Tubaria crobula*, Fries, Epicr., p. 299; Sacc., Syll. v., no. 3596.

Pileus slightly fleshy, convex, then plane, obtuse, slightly viscid, not striate, at first covered with white floccose scales,

then naked and hoary, tan-colour, 1–2 cm. across; gills slightly decurrent, 2–3 mm. broad, crowded, rusty-brown; spores elliptical, rusty-brown, 10 × 6 μ; stem 2–3 cm. long, 2–3 mm. thick, often incurved or more or less wavy, brownish, covered with white floccose scales like the pileus, hollow.

On fragments of twigs, &c., lying on the ground in damp places. Dannevirke, New Zealand. Ceylon, Europe.

Distinguished from *Tubaria furfuracea* by the slightly viscid pileus, and by the densely scaly stem, which often bears more or less evident traces of a ring.

10. **Flammula,** Fries.

Pileus regular, fleshy, margin incurved when young; gills decurrent, becoming rust-coloured when mature; stem central; veil fibrillose, never forming a distinct ring on the stem; spores ferruginous.

Flammula, Fries, Syst. Myc., i., p. 250 (as a subgenus of *Agaricus*).

Closely allied to *Pholiota*, the difference between the two genera depending on the relative development of the veil, which in the present genus is fibrillose, and does not form a distinct ring on the stem, whereas in *Pholiota* the veil is interwoven, and forms a definite ring. Most species grow on wood; colours bright, orange-brown or yellow being most frequent. Growing on trunks, stumps, &c. Some are destructive parasites.

** Gills adnexed.*

19. *Flammula purpureo-nitens*, Cke. and Mass., Grev., vol. xv., p. 94 (1887); Cke., Austr. Fung., p. 53; Sacc., Syll. v., no. 3393.

Pileus convex, fleshy, smooth, shining, purple-brown, margin even, about 2·5 cm. broad; gills adnexed, rather distant, broad, ferruginous; spores elliptical, tinted cinnamon-colour, 8 × 5 μ; stem 5 cm. long, 4–6 mm. thick, equal, ascending, fibrillose, solid, paler than the pileus, flesh pallid.

On wood. New Zealand. Victoria, Queensland, Western Australia.

20. *Flammula brunnea*, Massee, sp. nov.

Pileus subglobose, then expanding until almost plane, margin usually drooping, slightly umbonate, sometimes depressed round the umbo, 1–3 cm. across, even, glabrous, uniform dark-brown; flesh thin, pale greenish-yellow; gills adnexed, becoming almost or quite free as the pileus expands, crowded, rather broad, rusty-brown at maturity; spores elliptical, 5 × 3 μ, rusty; stem 3–7 cm. long, slender, almost equal, paler than the pileus, almost or quite smooth.

On logs. New Zealand.

Sent to Kew by Colenso mixed with *F. purpureo-nitens*, from which it differs, as also from every other described species, by the dark-brown pileus and greenish-yellow flesh. Fasciculate.

** *Gills adnate.*

21. *Flammula sapinea*, Fries, Syst. Myc., i., p. 239; Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 603; Austr. Fung., p. 52; Sacc., Syll. v., no. 3385.

Pileus hemispherical, then expanded, very obtuse, slightly floccosely squamulose superficially, then becoming broken up into minute squamules, tawny-orange, dry, paler towards the margin, 2·5–7 cm. across; flesh rather thick, compact; gills adnate, crowded, about 4 mm. broad, plane, yellow, then tawny-cinnamon; spores yellowish, elliptical, 8 × 5 μ; stem 2·5–5 cm. high, up to 1 cm. thick, solid or hollow, but stout and often irregular, fibrous, rooting, yellowish, becoming brownish when bruised.

On dead Conifers, also on the ground under pines. Northern Island, New Zealand. Australia, Europe, Ceylon, India, United States, Venezuela.

Usually more or less clustered. Smell strong. Stem short, often irregular.

22. *Flammula inopoda*, Sacc., Syll. v., no. 3373. *Agaricus inopus*, Fries, Syst. Myc., i., p. 251.

Pileus convex, then becoming almost plane, obtuse, even, smooth, slightly viscid when moist, honey-colour, disc reddish or with a reddish tinge all over, paler round the margin, becoming entirely pale, 2·5–8 cm. across; flesh thin, coloured like the pileus, white when dry; gills adnate, thin, crowded, about 4 mm. broad, yellowish-white, sometimes with a tinge of green, dry; spores broadly elliptical, ferruginous-brown, 10 × 6 μ; stem 6–12 cm. long, 2–8 mm. thick, often wavy, equal, rooting, adpressedly fibrillose, pale above, reddish-brown below, hollow.

On rotten trunks. Dannevirke, New Zealand. Europe.

Cæspitose or gregarious; somewhat resembling *Hypholoma fasciculare*, but distinguished by the long rooting base of the stem and the absence of a bitter taste.

23. *Flammula tilopoda*, Sacc., Syll. v., no. 3361. *Agaricus tilopus*, Kalchbr. and MacOwan, Grev., vol. , p.

Pileus convex, then almost plane, slightly umbonate, covered with a separable viscid pellicle, pale-yellow, ½–2 cm. broad; flesh thin, greenish-yellow; gills adnate, crowded, rather narrow, rusty; spores elliptical, rust-colour, 5–6 × 3 μ;

stem 6–15 cm. long, almost equal, coloured like the pileus, with scattered fibrils or squamules, base downy.

On mossy trunks, or on the ground near stumps. New Zealand. South Africa.

Colenso's New Zealand specimens agree exactly with the type specimens of Kalchbrenner and MacOwan, now in the Royal Herbarium, Kew.

Usually growing in small clusters.

24. *Flammula xanthophylla*, Cke. and Massee, Austr. Fung., p. 50. *Agaricus crociphyllus*, Cke. and Mass., Grev., 16, p. 1.

Pileus subglobose, then broadly expanded but the margin persistently incurved, ochraceous or with a tinge of primrose-yellow, glabrous at first, then broken up into minute innate squamules or cracked in an areolate manner, 2·5–7 cm. diameter; flesh thick, compact, rigid when dry; gills adnate, with a decurrent tooth, rather distant, very broad, bright-yellow, then with a rusty tinge; spores elliptical, $10 \times 6\,\mu$; stem distinctly excentric or lateral, about 2·5 cm. long, stout, solid, more or less striate, coloured like the pileus, or paler.

On wood. Dannevirke, New Zealand. Australia.

A very distinct and well-defined species, known by the broad clear-yellow gills and excentric stem.

25. *Flammula spumosa*, Fries, Syst. Myc., i, p. 252; Sacc., Syll. v., no. 3358.

Pileus convex, then plane, sometimes rather umbonate, covered with a viscid separable cuticle, naked (without squamules or fibrils), pale-yellow, disc darker and usually with a rufous tinge, even, 2·5–5 cm. across; flesh rather thin, watery, pale yellowish-green; gills adnate, crowded, pale-yellow, then ferruginous, about 3 mm. broad; spores yellow-brown, elliptical, $9 \times 5\,\mu$; stem 5–10 cm. long, about 4 mm. thick, almost equal, more or less fibrillose, but with a distinct cuticle, hollow, pale-yellow, or the colour of the pileus.

In woods, especially of Conifers, on the ground; rare on trunks. New Zealand. Australia, Europe, United States.

Gregarious, more or less cæspitose, growing mostly on the ground, but springing from buried wood or humus. Inodorous, pileus yellow, stem yellow or olive-brown, often narrowed downwards. Very viscid in wet weather.

26. *Flammula penetrans*, Fries, Obs. Myc., i., p. 23; Austr. Fung., p. 52; Fries, Icon., ii., p. 17, tab. 118, fig. 2; Sacc., Syll., no. 3381.

Gregarious or cæspitose; pileus convex, then plane, obtuse,

often irregular, even, glabrous, surface not becoming broken up, dry, minutely silky under a lens when young, golden-tawny, but becoming pale and yellowish when old, 4–8 cm. across; flesh pallid, thickish at the disc, thinning out towards the margin; gills adnate and subdecurrent when young, often separating from the stem when old, 4–6 mm. broad, crowded, white, then yellow, stained and spotted with brown when old; spores elliptical, obliquely apiculate, 8 × 4–5 μ; stem 5–8 cm. long, up to 1 cm. thick, firm, equal, silky, then fibrillosely striate, yellowish, base with white down, sometimes rooting, imperfectly hollow; veil flocculose, white, but very fugacious and scarcely evident.

On rotten wood. Dannevirke, New Zealand. Australia, Europe, Siberia, Cuba, United States.

A very showy fungus, distinguished in the genus by the clear tawny-orange pileus and yellow gills becoming spotted with brown.

**** Gills decurrent.*

27. *Flammula hyperion*, Cke. and Massee, Grev., vol. xvi., p. 72; Austr. Fung., p. 50; Sacc., Syll., suppl. ix., no. 438.

Pileus subglobose when young, then plano-convex, finally flattened, even, glabrous, tawny-orange, then reddish or brownish-orange, 4–8 cm. across; flesh 2–3 mm. thick, yellowish; gills decurrent, arcuate, rather distant, ochraceous, then tawny; spores 16–18 × 6–8 μ; stem about 5 cm. long, 1–2 cm. thick, becoming slightly thinner downwards, longitudinally grooved or striate, fibrillose and rather scaly, coloured like the pileus or paler.

On wood. New Zealand. Australia.

A very fine large species, and well marked, not approaching any other Australasian species. The spores are exceptionally large for a *Flammula*.

28. *Flammula vinosa*, Bull., Champ. France, tab. 54; Cke., Austr. Fung., p. 49; Sacc., Syll. v., no. 3323.

Pileus 2–4 cm. broad, centre very fleshy, becoming very thin at the margin, flesh white, convex, then expanded, at length often depressed and flexuous or wavy at the margin, dry, minutely flocculose, obscure rusty-cinnamon, usually with a tinge of purple; gills crowded, decurrent, simple, narrow, yellowish, then rusty; spores pale-umber, 5 × 3 μ; stem about 2·5 cm. long, 5–6 mm. thick, equal or thickened at the base, pale, delicately flocculose, solid.

On the ground. New Zealand. Victoria, Europe.

11. **Galera,** Fries.

Pileus regular, thin, often striate, margin straight and pressed to the stem when young; gills adnate, becoming almost free during expansion; stem central; spores rusty-ochre.

Galera, Fries, Syst. Myc., i., p. 264 (as a subgenus of *Agaricus*).

Most closely allied to *Naucoria,* but distinguished by the thin pileus, having the pileus straight when young. Corresponds in structure with *Mycena* and *Nolanea.* Growing on the ground.

29. *Galera tenera,* Schæff., t. 70; Massee, Brit. Fung.-Flora, ii., p. 144, figs. 5, 6, p. 3; Sacc., Syll. v., no. 3537.

Pileus conico-campanulate, obtuse, thin, hygrophanous, entirely yellowish rust-colour when moist, even, pale and rather atomate when dry, 1·5–2·5 cm. high and broad; gills adnate, crowded, ascending, rather broad, cinnamon; spores 12–13 × 7 μ; stem 6–10 cm. high, slender, straight, fragile, equal or slightly narrowed upwards, rather shining, striate upwards, coloured like the pileus.

Among short grass, &c. New Zealand. Australia, South Africa, Europe, United States, Brazil.

Variable in size, sometimes quite minute, at others exceeding the measurements given above. All one colour when moist, and the pileus very slightly striate; even, and pale everywhere when dry.

12. **Naucoria,** Fries.

Pileus regular, slightly fleshy, margin incurved when young; gills adnexed or adnate, never decurrent; stem central; spores rusty-brown.

Naucoria, Fries, Syst. Myc., i., p. 260 (as a subgenus of *Agaricus*).

Differs from *Galera,* its nearest ally, in the margin of the pileus being incurved when young. Growing on the ground.

**Pileus umbonate.*

30. *Naucoria acuta,* Sacc., Syll. v., no. 3456. *Agaricus (Naucoria) acuta,* Cooke, Grev., xiv., 841 (1886).

Pileus fleshy, conico-campanulate, acutely umbonate, glabrous, even, opaque, ochraceous, 3–5 mm. broad; gills adnate, somewhat crowded, yellowish, then cinnamon, edge paler; spores amber, elliptical, 7–8 × 5 μ; stem slender, hollow, equal, adpressedly fibrillose, yellowish-white, 2·5 cm. long, 1 mm. thick.

On rotten logs. New Zealand.

A very beautiful little endemic species, usually densely clustered or gregarious. Pileus somewhat orange-rusty at times. Apparently not uncommon in New Zealand.

31. *Naucoria sideroides*, Bull., Champ. France, pl. 588; Sacc., Syll. v., no. 3451.

Pileus campanulate, then expanded, umbonate, glabrous, viscid, yellowish-cinnamon, becoming ochraceous-tan and rather shining when dry, margin entire, incurved when young, 1·5–2·5 cm. broad; flesh very thin, white; gills adnate, with a decurrent tooth, sometimes slightly sinuate, narrow, crowded, ochraceous, then cinnamon; spores elliptical, pale-yellow, 8–10 × 4–6 μ; stem 5–8 cm. long, 2–4 mm. thick, slightly narrowed upwards, even, glabrous or sprinkled with white powder at the apex, pallid, then yellowish, rusty below and becoming brownish, stuffed or hollow.

On trunks, chips, &c.; rarely on the ground. Dannevirke, New Zealand. Europe.

32. *Naucoria melinoides*, Fries, Epicr., p. 195; Austr. Fung., p. 53; Sacc., Syll. v., no. 3437.

Pileus submembranaceous, convex, then almost plane, slightly gibbous or broadly umbonate, even, glabrous, tawny when moist, ochraceous when dry, or sometimes whitish, slightly striate at the margin when old, 1·5–2·5 cm. broad; gills adnate, triangular-oblong, crowded, margin minutely dentate, somewhat tawny or honey-colour; spores elliptical, 10–12 × 4–5 μ; stem 3–4 cm. long, 2–3 mm. thick, equal, or slightly thinner upwards, coloured like the pileus, base paler, sprinkled with white meal at the apex, rather firm, hollow.

Among short grass, &c. Dannevirke, New Zealand. Australia, Europe.

Gills very variable, sometimes adnexed, at others broadly adnate, honey-colour or cinnamon, retaining their colour after the pileus has become dry and ochraceous or whitish.

33. *Naucoria nasuta*, Kalchbr., Grev., vol. viii., p. 152, pl. 142, fig. 9; Austr. Fung., p. 54; Sacc., Syll. v., no. 3426.

Pileus thin, globose, then hemispherical, with a prominent elongated umbo, coarsely striate at the margin, remainder even, glabrous, 1–1·5 cm. high and broad, ochraceous-yellow; gills emarginate, with a decurrent tooth, rather crowded, broad, ventricose, rusty-orange; spores elliptical, 13–14 × 7–8 μ; stem about 5 cm. long and 2 mm. thick, equal, twisted, fibrillose, rusty-orange, fistulose.

On the ground. Dannevirke, New Zealand. New South Wales.

Distinguished by the prominent umbo.

34. *Naucoria temulenta*, Fries, Epicr., p. 199; Austr. Fung., p. 55; Massee, Brit. Fung.-Flora, ii., p. 165, figs. 8, 9, p. 3; Sacc., Syll. v., no. 3486.

Pileus almost membranaceous, campanulate, then convex, somewhat umbonate, never depressed; margin striate, glabrous, ferruginous when moist, ochraceous and even when dry, 1·5–2·5 cm. broad; gills adnate, rather distant, narrowed in front, lurid, then rusty-umber; spores elliptical, 12 × 6 μ; stem about 5 cm. long and 3 mm. thick, wavy or flexuous, glabrous, polished, apex slightly mealy, hollow, but the cavity often containing a loose pith.

On the ground, in damp woods, &c. Dannevirke, New Zealand. Australia, Europe.

Allied to *Naucoria pediades*, from which it differs in the pileus being more or less umbonate, never depressed, and striate when moist.

*** Pileus obtuse.*

35. *Naucoria fraterna*, Cke. and Massee., Grev., vol. xvi., p. 31; Sacc., Syll., suppl. ix., no. 458.

Cæspitose; pileus convex, depressed and umbilicate, even, glabrous, yellowish-rusty, 1–1·5 cm. broad; flesh thin, whitish; gills adnate, rather distant, broad, margin entire, yellowish rust-colour; spores elliptical, 10 × 6 μ; stem 2·5–5 cm. long, 2 mm. thick, slightly curved near the base, glabrous, coloured like the pileus, fistulose.

On trunks and stumps. Dannevirke, New Zealand. Australia.

Readily recognised by the cæspitose or tufted habit of growth, and in growing on stumps. Both these characters are unusual in the genus *Naucoria*.

36. *Naucoria pediades*, Fries, Epicr., p. 197; Sacc., Syll. v., no. 3469; Austr. Fung., p. 54.

Pileus thin, convex, then becoming plane, obtuse, often more or less depressed, never umbonate, dry, at length minutely rivulose or radially wrinkled, but never striate, yellowish-ochre, then pale tan-colour, 2·5–5 cm. across; gills adnexed, crowded at first, becoming rather distant as the pileus expands, about 4 mm. broad, at first brownish, then dingy-cinnamon; spores dingy-ferruginous, elliptical, 10–12 × 4–5 μ; cystidia fairly numerous, 30–50 × 8–10 μ; stem 5–8 cm. long, 2–4 mm. thick, somewhat flexuous, silky, yellowish, base slightly bulbous, stuffed with a distinct pith.

Among grass. New Zealand. Australia, Ceylon, South Africa, Europe, Siberia, United States.

Allied to *Naucoria sideroides*. For distinctive features, see note under last-named species.

37. *Naucoria semiorbicularis*, Bull., Champ. France, tab. 422; Austr. Fung., p. 55; Sacc., Syll. v., no. 3470.

Pileus hemispherical, then expanded, even, glabrous, slightly viscid, at length rivulose, tawny-ferruginous, ochraceous when dry, 2·5–5 cm. across when expanded; flesh thin, whitish; gills adnate, rarely more or less sinuous, very broad, crowded, pallid, then rusty-orange; spores elliptical, 10 × 5–6 μ; stem 5–10 cm. long, 2–4 mm. thick, tough, nearly straight, pale-ferruginous, shining, base usually darker, hollow, the cavity containing a free strand which readily splits into fibrils.

Among short grass, &c. Waitaki, New Zealand. Australia, India, Europe, United States.

Allied to *Naucoria pediades*, from which it is readily distinguished by the viscid pileus, broad gills, and rusty or ferruginous stem.

38. *Naucoria siparia*, Fries, Epicr., p. 201; Austr. Fung., p. 55; Sacc., Syll. v., no. 3507.

Pileus convex, then obtuse, not umbilicate, rusty-red, densely clothed with fasciculate tufts of down resembling minute scales, 1–2 cm. broad; gills adnate, broad, rather distant, coloured like the pileus, margin flocculose; spores 7–8 × 5–6 μ; stem about 2·5 cm. long, slender, equal, squamulose up to the ring, apex glabrous, coloured like the pileus.

On the ground, twigs, &c. New Zealand. Australia, Europe.

Distinguished by the squamulose stem and pileus. *Naucoria crinacea*, a species not recorded for New Zealand, closely resembles the present, but differs in the umbilicate pileus, stem squamulose nearly or quite up to the apex, and the margin of the gills quite entire.

13. **Hebeloma**, Fries.

Pileus regular, often rather fleshy, cuticle of the pileus not torn into scales or fibrils, smooth, often viscid, margin incurved when young; veil fibrillose or absent; gills adnexed and sinuate; stem central, fibrous; spores dingy-ochraceous.

Hebeloma, Fries, Syst. Myc., i., p. 249 (as a subgenus of *Agaricus*).

Closely allied to *Inocybe*, which differs mainly in having the cuticle of the pileus torn into scales or fibrils. Agrees structurally with *Tricholoma* in the *Leucosporæ*. Growing on the ground.

39. *Hebeloma strophosum*, Fries, Epicr., p. 161; Sacc., Syll. v., no. 3320.

Pileus subglobose, soon expanding and becoming convexo-plane and rather umbonate, fragile, viscid when wet, disc dark-tan, even, margin pale and silky from the remains of the veil, but not squamulose, 1·5–3 cm. across; flesh rather thin, watery; gills slightly adnexed, ventricose, 4–8 mm. broad, pallid, then dingy-cinnamon; spores 7–8 × 4 μ; stem 2·5–5 cm. long, hollow, about 6 mm. thick, equal, fragile, pallid and becoming brownish downwards, adpressedly silky, with a more or less perfect silky ring near the apex.

Grassy spots. Wairarapa, Northern Island, New Zealand. Europe.

Distinguished more especially by the hollow stem, which is not rooting, and the silky ring very near to the apex of the stem.

14. **Pholiota**, Fries.

Pileus regular, fleshy; gills adnate or adnexed, rust-coloured at maturity; stem central, with a distinct ring; spores rusty-orange.

Pholiota, Fries, Syst. Myc., i., p. 240 (as a subgenus of *Agaricus*).

The only genus in the *Ochrosporæ* having the stem furnished with a persistent ring. Growing on trees; some species are destructive parasites; a few species are very showy in colour and form.

* *Pileus obtuse, not umbonate.*

40. *Pholiota adiposa*, Fries, Syst. Myc., i., p. 242; Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 602; Sacc., Syll. v., no. 3107.

Pileus convex, obtuse, then expanding, glutinous, yellow, with superficial concentrically arranged seceding darker squarrose scales, 5–12 cm. across; flesh whitish, compact at the disc; gills adnate, 6–8 mm. broad, yellow, then rusty-orange; spores elliptical, rusty-orange, 7 × 3 μ; stem 7–12 cm. long, up to 2 cm. thick, base somewhat bulbous, remainder more or less equal throughout, yellow, ornamented with concentrically arranged rusty-orange evanescent scales up to the superior, floccose, radiating ring, stuffed.

On decaying parts of trees. Cape Turnagain, Northern Island, New Zealand. Europe, United States.

A very showy fungus when well grown. Usually cæspitose, and forming large clusters. Distinguished by the glutinous pileus and stem, both of which are at first ornamented with rusty-orange or ferruginous squarrose or spreading scales. The scales appear eventually to deliquesce in the gluten, which

is washed away in rainy weather, leaving the pileus and stem naked. In dry weather the pileus is shiny, due to the dried gluten. Poisonous.

41. *Pholiota pudica*, Bull., Champ. France, tab. 597, fig. 2, R, S; Austr. Fung., p. 44; Sacc., Syll. v., no. 3065.

Pileus fleshy, convex, then expanded, or even depressed, obtuse, even, dry, glabrous, white or slightly tinged with tawny; 2·5–8 cm. across; gills adnexed, rounded behind, ventricose, about 4 mm. broad, whitish, then tawny; spores elliptical, 6–7 × 3·5 μ; stem 2·5–5 cm. long, 5–10 mm. thick, straight or most frequently curved and ascending, equal, even, white, solid; ring superior, persistent, white, spreading.

On trunks. New Zealand. Australia, Europe.

Simple or cæspitose; stem sometimes excentric and curved at the base. According to Bulliard's figure, quoted above, the pileus is pruinose at the disc.

42. *Pholiota pumila*, Fries, Eleuch., p. 29 (1828); Cke., Austr. Fung., p. 46; Sacc., Syll. v., no. 3135.

Pileus rather fleshy, hemispherical, obtuse, even, hygrophanous, glabrous, ochraceous or rarely brownish-cinnamon, 1–1·5 cm. broad; flesh dingy; gills adnate, crowded, about 3 mm. broad, pallid-yellowish; spores 8–10 × 5–6 μ; stem 2·5–5 cm. long, about 2 mm. thick, yellow, somewhat fibrillose, hollow; ring superior, floccose, not interwoven into a membrane, only forming a zone round the stem.

On the ground, among grass and moss. New Zealand. Victoria, New South Wales, Europe.

43. *Pholiota erebia*, Fries, Syst. Myc., i., p. 246; Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 602; Austr. Fung., p. 43; Sacc., Syll. v., no. 3050.

Pileus convex, then flattened, glabrous, rather viscid, hygrophanous, margin striate, umber, often with an olivaceous tinge, ochraceous-tan and often rugulose or wrinkled when dry, 2·5–5 cm. across; flesh thin, dingy; gills adnate, rather distant, about 4 mm. broad, pallid, then dingy-cinnamon; spores elliptical, 10–12 × 4–6 μ; stem about 5 cm. long, 6–8 mm. thick, equal, somewhat striate, soon pale, hollow; ring superior, soon pendulous, with the margin upturned, more or less striate.

On the ground. Ahuriri, Northern Island, New Zealand. Australia, Europe.

Distinguished by the dark-umber colour of the pileus when moist and the superior ring. The pileus is sometimes more or less umbonate, at others slightly depressed; somewhat fragile.

44. *Pholiota marginata*, Batsch, fig. 207; Austr. Fung., p. 45; Sacc., Syll. v., no. 3130.

Pileus convex, then expanded, hygrophanous, moist, glabrous, margin striate, honey-colour, becoming pale-tan when dry, about 2·5 cm. across; flesh thin; gills adnate, crowded, about 2 mm. broad, watery-cinnamon; spores 7–8 × 4 μ; stem 3–5 cm. long, 2–4 mm. thick, equal or slightly thickened at the base, soft, not scaly, mealy above the fugacious ring, pale-tan, base darker and surrounded with white down, hollow.

On trunks, heaps of leaves, &c. Dannevirke, New Zealand. Australia, Europe, Siberia.

Allied to *Pholiota mutabilis*, but differing in the stem below the ring not being scaly, but only somewhat fibrillose; commonly smaller; solitary or gregarious, rarely cæspitose.

** *Pileus umbonate.*

45. *Pholiota squarrosa*, Müll., in Fries' Syst. Myc., i., p. 143; Sacc., Syll. v., no. 3093.

Pileus campanulate, then expanded, often broadly and obtusely umbonate, dry, yellowish-brown, covered with darker persistent squarrose scales, 5–10 cm. across; flesh firm, thickish, white but usually tinged yellow or green; gills slightly decurrent, crowded, about 4 mm. broad, pale-olive, then rusty; spores rusty, 8 × 4 μ; stem 7–12 cm. long, up to 1 cm. thick, slightly narrowed towards the base, more or less wavy or ascending, pale tawny-yellow or brown, and covered with darker recurved scales up to the superior spreading ragged ring, smooth and pale above the ring, stuffed.

On trunks, on and near stumps, &c. Dannevirke, New Zealand. Europe, United States.

Usually growing in dense clusters; smell strong, dull rusty-orange, with darker squarrose or spreading scales on the pileus and stem. Distinguished from *Pholiota adiposa* by the darker colour of the entire fungus and the persistent scales. Poisonous.

46. *Pholiota mutabilis*, Schæffer, t. 9.; Austr. Fung., p. 45; Sacc., Syll. v., no. 3129.

Pileus convex, then expanded, usually obtusely umbonate, sometimes depressed round the umbo, glabrous, deep cinnamon-colour, becoming paler when dry, size very variable, 2·5–10 cm. across; flesh thin; gills adnate and slightly decurrent, crowded, rather broad, pallid, then cinnamon-colour; spores 9–11 × 5–6 μ; stem 3–10 cm. long, rigid, nearly equal, covered with squarrose scales up to the superior membranaceous ring which is minutely scaly outside, brownish below,

paler upwards and smooth above the ring, stuffed, then hollow, often incurved and ascending.

On trunks and stumps; rarely on the ground, and then springing from buried wood. Dannevirke, New Zealand. Australia, Tasmania, Europe, Siberia, United States.

An elegant species when well grown. Known from *Pholiota squarrosa* by the glabrous pileus. Most closely allied to *Pholiota marginata*, under which species the differences are indicated.

47. *Pholiota unicolor*, Vahl, Flor. Dan., tab. 1071, fig. 1; Sacc., Syll. v., no. 3132.

Pileus 1–2 cm. across; flesh thin; campanulate, then convex, slightly umbonate, glabrous, almost even, at length slightly striate at the margin, hygrophanous, bay, ochraceous when dry; gills adnate, receding, broad, almost triangular, ochraceous-cinnamon; spores 9–10 × 5 μ; stem 2–5 cm. long, about 2 mm. thick, almost glabrous and equal, coloured like the pileus, stuffed, then hollow, often slightly curved at the base; ring superior, slender, entire.

On trunks and branches. New Zealand. South Africa, Europe.

Subcæspitose; constant in habit, form, and colour.

RHODOSPORÆ.

ANALYSIS OF THE GENERA.

* *Pileus excentric; gills decurrent.*

15. CLAUDOPUS.

** *Pileus regular; gills adnate or adnexed.*

16. LEPTONIA.

*** *Pileus regular; gills free.*

17. PLUTEUS.

15. **Claudopus**, W. G. Smith.

Pileus excentric, lateral, or resupinate; gills more or less decurrent; stem very short or absent; spores salmon-colour.

Claudopus, W. G. Sm., *Clavis Agaric.*, p. 17.

The species are minute, distinguished by the excentric or resupinate pileus, rudimentary or obsolete stem, and salmon-coloured spores. Agreeing in structure with the simplest forms of *Pleurotus*, which differ in the white spores. Growing on dead wood, herbaceous stems, &c.

48. *Claudopus depluens*, Batsch, Consp. Fung., f. 122; Massee, Fung.-Flora, ii., p. 237, figs. 1–3, p. 236; Sacc., Syll. v., no. 3041. *Agaricus depluens*, Batsch, *loc. cit.*

Pileus almost membranaceous, watery, fragile, more or less

convex, with the margin incurved, rather silky, whitish or with a tinge of red, more or less hoary when dry, 1–1·5 cm. across; gills broad, ventricose, crowded, pale-grey, then reddish; spores pink, globose, rather coarsely warted, 5–6 μ diameter. The pileus is either almost sessile or furnished with a short lateral or sometimes almost central stem.

On the ground, attached to moss, twigs, &c.; also on wood. Dannevirke, New Zealand Australia, Europe, United States.

In the young condition, while the gills are yet white, the present species might be mistaken for a *Pleurotus*: the pink warted spores readily show its affinities at maturity. The present species is quite distinct from *Crepidotus epigæus*, although given as a synonym under the last-named species by Cooke, in Austr. Fung., no. 299, p. 59. *C. depluens* has been also received from Queensland.

16. **Leptonia**, Fries.

Pileus regular, thin, umbilicate, margin incurved when young; gills adnate or adnexed, but soon separating from the stem, and then appearing as if free; stem central, externally cartilaginous and polished; spores salmon-colour.

Leptonia, Fries, Syst. Myc., i., p. 201 (as a subgenus of *Agaricus*).

Allied to *Nolanea*, but distinguished by the umbilicate pileus having the margin incurved when young. Corresponding in structure to *Collybia* in the *Leucosporæ*. Rarely on wood; mostly in open pastures. Tints of blue or green are not uncommon in the genus.

49. *Leptonia asprella*, Fries, Epicr., p. 154; Massee, Brit. Fung.-Flora, ii., p. 256; Sacc., Syll. v., no. 2054.

Pileus somewhat membranaceous, convex, then expanded, umbilicate, and there more especially downy, then squamulose, sometimes glabrous (except the disc), sometimes fibrillose, hygrophanous, at first smoke-colour, or mouse-colour, then livid grey, 2·5–4 cm. across; gills adnate, then separating from the stem and becoming free, rather distant, plane, equally narrowed from the stem to the margin, greyish-white, edge quite entire and of the same colour as the remainder; spores elliptical, 10–12 × 6–8 μ; stem 2·5–5 cm. long, not more than 2 mm. thick, equal, straight, even, glabrous, cartilaginous, hollow, livid, fuscous, green and blue mingled, &c., base with white down.

Among grass. New Zealand. Europe.

Some specimens have the pileus squamulose everywhere, some forms resemble a *Nolanea*; pileus hemispherical, then campanulate, disc sometimes with a minute depression, sometimes with a papilla (Fries).

50. *Leptonia placida*, Fries, Syst. Myc., i., p. 202 (1821); Sacc., Syll. v., no. 2920.

Pileus 2–6 cm. across, flesh thin, campanulate, then convex, not striate, the blackish disc densely downy, the remainder covered with blackish fibrils or squamules on a greyish-white ground, squamules arranged concentrically when old; gills adnexed, very broad behind, not ventricose, crowded, whitish, as is also the margin; stem 5–8 cm. long, 3 mm. thick, equal, very rigid, having white meal at the slightly thickened apex, and with black points or squamules when seen under a lens, remainder glabrous, even, dark-blue or blackish-blue.

On trunks or on the ground. New Zealand. Europe.

Distinguished from *Leptonia lampropoda* by the squamulose pileus and the minute black points on the upper part of the stem.

51. *Leptonia æthiops*, Fries, Epicr., p. 152 (1836); Sacc., Syll. v., no. 2924.

Pileus 1·5–2·5 cm. across, flesh thin, plane, then depressed, not striate, fibrillosely virgate, shining, sooty-black, not hygrophanous, but young specimens are black and shining when dry; gills adnexed or adnate, straight or ventricose, whitish, edge same colour and quite entire; stem 3–5 cm. long, hardly a line thick, glabrous, blackish-brown, having black points near the top; spores irregularly nodulose, salmon-colour, $10 \times 7\ \mu$.

Among grass, on the ground. New Zealand. Europe.

Distinguished from its ally, *Leptonia lampropoda*, by the pileus being depressed from the first, and the slender stem with black points at its apex.

52. *Leptonia lampropoda (Agaricus (Leptonia) lampropus)*, Fries, Epicr., p. 152; Austr. Fung., p. 40; Sacc., Syll. v., no. 2923.

Pileus convex, then expanded, not becoming campanulate, obtuse, at length depressed, almost even when young, never striate, at length more or less squamulose, mouse-colour, or sooty-grey with a blue tinge, becoming paler but not hygrophanous, about 2·5 cm. across; flesh thin; gills adnate, easily separating from the stem and appearing as if free, ventricose, white, then pale flesh-colour; spores irregularly nodulose or angular, 10–11 × 6–7 μ; stem 2·5–3·5 cm. long, up to 4 mm. thick, entirely cartilaginous, glabrous, even, not punctate upwards, usually bluish-violet, hollow.

Among grass, &c. Dannevirke, New Zealand. Europe, Australia.

Distinguished from several nearly allied species by the

pileus not being umbilicate and not in the least striate, and the stout stem.

17. **Pluteus**, Fries.

Pileus regular; gills quite free from the stem; stem central, ring and volva entirely absent; spores pale salmon-colour.

Pluteus, Fries, Epicr., p. 140 (as a subgenus of *Agaricus*).

Distinguished among the *Rhodosporæ* by the free gills and absence of volva and ring. The species grow on wood.

53. *Pluteus cervinus*, Schæff., Icon., tab. 10 (1800); Cke., Austr. Fung., p. 38; Sacc., Syll. v., no. 247.

Generally solitary. Pileus 4–10 cm. across, flesh white, thick at the disc, becoming very thin towards the margin, campanulate, then expanded, even, at first glabrous, then becoming broken up into fibrillose squamules that soon disappear, smoky, with a yellow, brown, or fawn-coloured tinge; gills free, crowded, 4–8 mm. broad, white, then salmon-colour; spores broadly elliptical, smooth, 7–8 × 5–6 μ; cystidia ventricose, often spinose at the apex; stem 5–12 cm. long, 1 cm. and more thick, equal, pale and sprinkled with blackish fibrils, solid.

On trunks and stumps. New Zealand. Victoria, Tasmania, Ceylon, South Africa, Europe.

Leucosporæ.

Analysis of the Genera.

A. Margin of gills split; split portions curved outwards.

18. Schizophyllum.

B. Margin of gills not split; entire fungus soft, soon decaying after maturity.

* *Gills decurrent; pileus regular.*

19. Cantharellus. Gills narrow, edge thickened.

20. Omphalia. Edge of gills sharp; stem cartilaginous and polished outside.

21. Clitocybe. Edge of gills sharp; stem fibrous externally.

22. Hygrophorus. Edge of gills sharp; plants brittle, watery. (Some species have the gills adnate, or almost free.)

** *Gills decurrent; stem excentric or lateral.*

23. Pleurotus.

*** *Gills adnate or adnexed.*

† Ring on stem absent.

24. Laccaria. Gills becoming mealy with the globose warted spores.

25. Collybia. Gills not mealy; margin of pileus incurved when young.

26. Mycena. Gills not mealy; margin of pileus straight when young.

27. Tricholoma. Gills not mealy, sinuate.

†† Ring present on stem.

28. Armillaria.

**** *Gills free.*

29. LEPIOTA. Volva absent from base of stem.
30. AMANITA. Volva present at base of stem.

C. MARGIN OF GILLS ENTIRE; ENTIRE FUNGUS CORIACEOUS OR CORKY, DRYING UP AT MATURITY, AND NOT DELIQUESCING.

* *Gills forked, edge thickened.*

31. XEROTUS.

** *Edge of gills sharp, entire.*

32. MARASMIUS. Stem central.
33. PANUS. Stem excentric, lateral, or absent.

D. MARGIN OF GILLS TOOTHED OR ERODED.

34. LENTINUS.

E. PILEUS SESSILE, CORKY, GROWING HORIZONTALLY.

35. LENZITES.

18. **Schizophyllum,** Fries.

Pileus thin, without flesh, dry, flaccid and tough, tomentose, sessile, fan-shaped; gills radiating from the point of attachment, forking, splitting along the edge, the split portions curving away from the line of splitting, dry; spores hyaline or tinged with brownish-purple.

Schizophyllum, Fries, Obs., i., p. 103; Sacc., Syll., v., p. 654.

A small but cosmopolitan genus, most abundant in tropical and subtropical countries. Characterized by the thin dry substance of the entire fungus and the gills splitting along the edge. Growing on wood.

54. *Schizophyllum commune*, Fries, Syst. Myc., i., p 333; Austr. Fung., p. 100, fig. 47; Flora N.Z., ii., p. 177; Hdbk. N.Z. Flora, p. 606; Sacc., Syll. v., no. 2705.

Pileus very thin, dry, sessile, resupinate or usually attached laterally and spreading like a fan, entire or variously lobed; pileus tomentose, greyish, 1–6 cm. broad; gills radiating from the point of attachment, forking, narrow, dry, splitting along the edge, split surfaces minutely downy, grey, then tinged purplish-brown; spores hyaline, elliptical, apiculate, 5-6 × 4 μ.

On trunks, branches, and worked wood. Common in New Zealand, and very general in tropical and subtropical regions, becoming rare in colder regions.

Very variable, sometimes resupinate and almost entire, usually lateral and spreading from the point of attachment in a fan-like manner. Sometimes cut into deep narrow lobes.

19. **Cantharellus,** Adans.

Pileus often fleshy but thin in small species, often lobed or irregular; gills more or less decurrent, narrow, edge thick, entire; stem central, excentric, or absent; spores white, smooth.

Cantharellus, Adanson, Fung. Ord., v.

Distinguished among white-spored genera with decurrent gills by the narrow entire gills having the edge blunt or thickened. Growing on the ground.

55. *Cantharellus umbriceps*, Cke., Grev., vol. viii., p. 54, pl. 132, figs. 1, 2; Sacc., Syll. v., no. 1902.

Pileus fleshy, soft, subglobose, then expanding, then depressed, margin incurved, glabrous, umber, about 3 cm. diameter; gills very narrow, thick, forked, not crowded, dingy-orange; stem about 4 cm. long and 1 cm. thick at the slightly swollen base, solid, white with a tinge of yellow; spores globose, 4 μ diameter.

On the ground. Maungaroa, New Zealand.

As the species was founded upon the examination of a single specimen, accompanied by a coloured drawing, it is probable that the size and some minor details given above may require modification.

20. **Omphalia,** Fries.

Pileus symmetrical, usually very thin, depressed or infundifuliform; gills truly decurrent, edge thin, entire; stem distinctly cartilaginous externally, tubular, but the cavity is frequently stuffed, especially when young, usually widening upwards into the pileus; spores hyaline.

Omphalia, Fries, Syst. Myc., i., p. 162 (as a subgenus of *Agaricus*).

Agreeing with *Clitocybe* in the decurrent gills, but readily known by the externally polished, cartilaginous stem. The species are with few exceptions small, and many grow on wood, twigs, &c. Smell obsolete, or nearly so, in all the species.

* *Pileus even.*

56. *Omphalia anthiceps*, Berk. and Curt., Journ. Linn. Soc. (Bot.), vol. x., p. 286; Sacc., Syll. v., no. 1222.

Densely tufted; pileus deeply umbilicate, often somewhat umbonate but the umbo sunk in the central depression, thin, even, glabrous, white, disc tinged brown, 1–1·5 cm. broad; gills adnato-decurrent, distant, rather broad, white; spores subglobose, 4–5 μ diameter; stem 1–1·5 cm. long, slender, glabrous, white, hollow.

Densely cæspitose, on decaying logs. New Zealand. Cuba.

Distinguished by the much-crowded habit, and the white pileus having the centre depressed and tinged brown.

56A. *Omphalia leonina*, Massee.

Pileus campanulate, slightly umbilicate, even, glabrous, very thin, extreme margin sometimes slightly upturned, rich tawny-yellow, 4–8 mm. across; gills deeply decurrent, paler than the pileus, very distant, thick; spores broadly elliptical, hyaline, smooth, 5 × 3 μ; stem about 2 cm. long, slender, expanding upwards into the pileus, polished, rich orange-brown, with delicate tawny scurf at the base.

Found at Kew Gardens, England, on a piece of dead wood covered with a fern that had come direct from New Zealand.

Allied to *Omphalia colensoi*, but distinguished from this and every other species by the tawny-yellow pileus, very thick distant gills, and the brown stem.

*** Pileus striate.*

57. *Omphalia fibula*, Bull., Champ. France, tab. 186, fig. 1; Sacc., Syll. v., no. 1285.

Pileus membranaceous, almost translucent, rather tough, usually umbilicate, then infundibuliform; margin drooping, then expanded, sometimes conical and more or less papillate; glabrous, hygrophanous, striate and orange-yellow or sometimes brownish or quite white when moist, pale when dry, up to 1·5 cm. across, usually much smaller; gills deeply decurrent, distant, distinct, broad, whitish; spores elliptical, 4–5 × 2 μ; stem 2–3 cm. long, very slender, coloured like the pileus, stuffed, then hollow, sometimes more or less tinged with violet at the apex.

Damp places, amongst moss, &c. New Zealand. Australia, Europe, United States.

Often growing on ground that has been burnt. Slender and delicate, but rather tough.

58. *Omphalia stellata*, Fries, Syst. Myc., i., p. 163; Sacc., Syll. v., no. 1257.

Entirely white. Pileus truly membranaceous, convex, umbilicate, pellucidly striate, glabrous, 1–1·5 cm. across; gills decurrent, rather distant, thin, not triangular; spores elliptical, 6–7 × 4 μ; stem usually about 2 cm. long, very slender, fragile, stuffed, then hollow, often curved, base dilated and radially strigose or hairy.

On logs, stumps, &c. Dannevirke, New Zealand. Europe.

Often gregarious. Distinguished by the semitranslucent white colour of every part, and the strigose base of the stem. Pileus frequently excentric.

59. *Omphalia colensoi*, Berk., Flora N.Z., ii., p. 173; Hdbk. N.Z. Flora, p. 602 (as *Agaricus (Omphalia) colensoi*); Sacc., Syll. v., no. 1264.

Pileus thin, rather deeply umbilicate, sometimes almost funnel-shaped, glabrous, entirely covered with very fine radial wrinkles (when dry), margin incurved, 1–1·5 cm. across; gills pallid, rather narrow, slightly decurrent, thin and not distant; spores hyaline, subglobose, about $4 \times 3\,\mu$; stem 1–1·5 cm. long, slender, minutely scurfy, then becoming glabrous.

On the ground, amongst sand and scraps of wood, wet logs, &c. Ngaawapurua, Northern Island, New Zealand.

The pileus appears to have been whitish when fresh, stem darker. Distinguished from *Omphalia umbellifera* by the thin, rather close gills. Type specimens examined.

60. *Omphalia pyxidata*, Bulliard, Champ. France, tab. 568, fig. 2; Sacc., Syll. v., no. 1199.

Pileus membranaceous, umbilicate, then infundibuliform, almost glabrous; radially striate and brick-red or rufescent when moist, hygrophanous; whitish and minutely silky when dry; 1·5–2·5 cm. across; gills decurrent, rather distant, narrow, flesh-colour, then yellowish; spores $7–8 \times 5–6\,\mu$; stem 2–2·5 cm. long, 2 mm. thick, even, tough, pale-rufescent, stuffed, then hollow.

Among short grass, &c. Dannevirke, New Zealand. Europe, Australia.

Characterized by the dull-red tinge of the entire fungus and the narrow gills.

Specimens of this species have been found amongst the New Zealand fungi sent to Kew by Colenso, hence its occurrence does not rest on the doubtful identification of the specimens alluded to in the "Handbook of the New Zealand Flora," p. 602.

61. *Omphalia umbellifera*, Linn., Suec., no. 1192; Flora N.Z., ii., p. 173; Hdbk. N.Z. Flora, p. 602; Austr. Fung., p. 28; Sacc., Syll. v., no. 1241.

Pileus convex, then almost plane and obconic, often more or less wavy and upturned, radiately striate when moist, even and silky when dry, 1·5–2 cm. across; gills decurrent, very distant, broad behind, whitish or coloured like the pileus; spores broadly elliptical, $7 \times 4\,\mu$; stem about 1 cm. long and 2 mm. thick, coloured like the pileus, base downy, imperfectly hollow.

On the ground. Northern Island, New Zealand. Australia, Tasmania, Ceylon, Europe, Greenland, United States.

Very variable in colour; most commonly whitish, becoming shining white when dry, but also grey, yellow, brownish,

green, &c. The margin of the pileus is incurved and crenulate when young. Known among allied forms by the thicker almost flat pileus and the broad somewhat triangular very distant gills.

21. **Clitocybe,** Fries.

Pileus generally fleshy at the disc, and becoming thin towards the margin, flexible or tough, for the most part plano-depressed or infundibuliform, margin involute; gills decurrent, edges thin, entire; stem central, externally fibrous, somewhat elastic, stuffed, often becoming hollow; veil obsolete; spores hyaline, elliptical or subglobose.

Clitocybe, Fries, Syst. Myc., i, p. 70 (as a subgenus of *Agaricus*).

Differs from *Omphalia*, its closest ally, in the stem being fibrous externally, and not polished or cartilaginous. The gills are also usually much less decurrent, being, in fact, sometimes only slightly so *Pleurotus* differs in the lateral or excentric stem, and *Hygrophorus* in the waxy gills. Finally, *Cantharellus* is separated by the narrow, distant, thick-edged gills. Growing on the ground.

62. *Clitocybe infundibuliformis*, Schæffer, t. 212; Flora N.Z., ii., p. 173; Hdbk. N.Z. Flora, p. 602; Austr. Fung., p. 15; Sacc., Syll. v., no. 595.

Pileus convex when young, then depressed, umbo blunt, margin incurved, at maturity becoming softer and flaccid and completely infundibuliform or funnel-shaped, up to 8 cm. across; disc fleshy, remainder thin, firm when young, yellowish flesh-colour, then buff, becoming pallid or whitish; gills decurrent, rather crowded, narrowed to both ends, soft, white; spores 5–6 × 3–4 μ; stem 7–10 cm. long, 6–10 mm. thick, stuffed, externally firm, elastic, attenuated upwards, rarely equal, pallid, base with white down.

Among moss and grass, in pastures and woods. Northern Island, New Zealand. Europe.

Smell pleasant. Colour changing from pale-reddish through buff to white when old, but not white at first.

22. **Hygrophorus,** Fries.

Pileus fleshy, often lobed, and frequently viscid or moist; gills decurrent, adnate or adnexed, often distant and thick at the base, but margin always thin and entire; stem central; spores smooth. Entire fungus very brittle.

Hygrophorus, Fries, Syst. Myc., i., p. 98.

A very natural genus in spite of the various modes of gill attachment. The plants are often brightly coloured, very brittle, soon decaying; allied to *Cantharellus*, but differing in

the thin, sharp edge of the gills. Fries says the essential feature of the genus consists in the hymenium at length becoming soft and separating from the trama. All the species grow on the ground, usually in open grassy places. Mostly appearing late in the season, and stimulated by cold or even slight frost.

63. *Hygrophorus coccineus,* Schæffer, Fung. Bavar., tab. 302; Austr. Fung., p. 75; Sacc., Syll. v., no. 1637.

Pileus convex, then plane, often irregular, at first viscid, even, bright-crimson when moist, pallid when dry, not floccosely squamulose, margin thin, more or less wavy, 2·5–6 cm. across; flesh thin, coloured like the pileus, and also descending into the trama of the gills; gills broadly adnate, with a decurrent tooth, distant, connected by veins, soft and watery, base purplish, middle part yellow, and margin glaucous when adult; spores elliptical, smooth, 10–12 × 6 μ; stem about 5 cm. long, 6–10 mm. thick, often compressed, almost even, not slimy, crimson above, base always pale-yellow, hollow.

Among short grass, in pastures and open places. New Zealand. Australia.

Distinguished among crimson-coloured species by the broadly adnate gills and yellow base of the stem. Gills thick, wrinkled or veined; when quite dry the pileus is almost white.

64. *Hygrophorus miniatus,* Fries, Epicr., p. 330; Austr. Fung., p. 76; Sacc., Syll. v., no. 1639.

Pileus 1·5–2·5 cm. across, flesh thin, convex, obtuse, then umbilicate, at first even, glabrous, and crimson, then becoming pale, opaque, and squamulose; gills adnate, not at all decurrent, distant, distinct, rather thick and firm, yellow, or sometimes more or less tinged with crimson; stem 3–5 cm. long, about 2 mm. thick, even, glabrous, shining, crimson, equal, round, imperfectly stuffed; spores elliptical, 10 × 6 μ.

Among grass, in pastures, roads, &c. Maungaroa, New Zealand. Europe, Australia, Ceylon.

Pileus becoming umbilicate, bleached, and squamulose when old.

65. *Hygrophorus cyaneus,* Berk., Hdbk. N.Z. Fl., p. 604; Grev., vol. viii., p. 54.

Entirely clear sky-blue. Pileus acutely conical, splitting, slightly striate, 4 cm. high; gills free, very broad (1 cm.) in front, gradually narrowing to the stem; stem 12 cm. high, 7–8 mm. thick, hollow, base thickened.

Middle Island: Beech forests, amongst moss, Nelson Province. *Julius Haast.*

The present species is somewhat uncertain, being described by Berkeley from a crude drawing only.

To this species Cooke refers a drawing of a Fungus from Waitaki, with the following remark: "The colour as shown in the drawing is verdigris-green, but in other respects it does not appear to differ from the typical form in any essential particular."

23. **Pleurotus,** Fries.

Pileus fleshy, excentric, membranaceous and often resupinate in the minute species; gills decurrent, often anastomosing behind, edge entire and sharp; stem gradually widening into the pileus, excentric or lateral, sometimes absent; spores elongated.

Pleurotus, Fries, Epicr., p. 129 (as a subgenus of *Agaricus*).

Soon decaying, soft and fleshy, features which separate the present genus from others with an excentric or lateral stem. Growing on decaying wood.

* *Pileus always more than 1 cm. across.*

† Pileus coloured.

66. *Pleurotus ostreatus*, Jacq., Fung. Austr., t. 268; Austr. Fung., p. 31; Sacc., Syll. v., no. 1390. *Pleurotus glandulosus*, Bull., t. 426; Sacc., Syll. v., no. 1391. *Pleurotus columbinus*, Quelét, in Bresad., Fung. Trident., p. 10, t. vi.; Sacc., Syll. v., no. 1395.

Imbricated or dimidiate. Pilei at first convex and horizontal, then expanded and ascending, flabellate or more or less oyster-shell-shaped, margin often incurved, glabrous, moist, even, but the cuticle sometimes torn into squamules, often almost black when quite young, then brownish-grey, clear blue-grey with a violet tinge, or lavender colour, often becoming yellowish when old; 6–15 cm. across; flesh thick, white, brownish just below the cuticle, up to 2 cm. thick; gills decurrent, anastomosing behind and forming a network down the under-surface of the stem, rather distant, broad, white, or tinged yellow, never pinkish; spores elliptical, white, 10–12 × 4–5 μ; stem obliterated, or short, firm, thickened near the pileus, base downy or strigose.

On trunks. New Zealand. Australia, Europe, Siberia, South Africa.

Cæspitose. Smell strong. Distinguished from every species of *Pleurotus* except *P. corticatus* by the gills anastomosing behind, and often forming a network running down the under-surface of the stem-like base. *P. corticatus* differs from the present species in having a ring on the stem. *P. glandulosus*, Bull., is the present species with the gills bearing minute glands.

or warts here and there, due to the out-growth of the hyphæ of the trama. *P. columbinus*, Quelét, is the present species with the bluish-grey pileus.

Edible; celebrated from early times for its excellent flavour.

67. *Pleurotus algidus*, Fries, Syst. Myc., i., p. 190; Sacc., Syll. v., no. 1496.

Pileus rather fleshy, at first resupinate, then expanded and horizontal, reniform or semicircular, glabrous, covered with a thin viscid pellicle, reddish-brown, grey, or umber, sessile or prolonged behind into a short stem-like base; 1·5–3 cm. across; gills radiating from the point of attachment of the pileus to the matrix, rather broad, crowded, yellowish; spores subglobose, 5–6 μ diameter.

On rotten wood, stumps, &c. Dannevirke, New Zealand. Europe, United States, Chili.

Usually cæspitose and imbricated.

68. *Pleurotus atro-cæruleus*, Fries, Epicr., p. 137; Austr. Fung., p. 35; Massee, Brit. Fung.-Flora, ii., p. 379; Sacc., Syll. v., no. 1492.

Pileus at first resupinate, sessile, soon distinctly reflexed and becoming horizontal, obovate or reniform, downy, rarely almost glabrous, rugulose when dry, due to contraction of the cuticle, usually blackish-blue, rarely brownish; 2·5–5 cm. long, up to 2·5 cm. broad; flesh soft, upper stratum (pellicle) slightly gelatinous, up to 4 mm. thick, blackish-brown; lower layer (or flesh proper) thin and whitish; gills at first radiating from a point inside the margin, then converging towards the base, broad, whitish, at length tinged with yellow; spores 7–8 × 5 μ.

On rotten trunks. Dannevirke, New Zealand. Australia, Central Africa, Europe, United States.

Sessile, gregarious, somewhat imbricated. Smell pleasant. Distinguished by the dusky colour of the pileus and by the dark-coloured gelatinous cortical layer.

69. *Pleurotus mitis*, Pers., Syn., p. 481; Austr. Fung., p. 33; Sacc., Syll. v., no. 1425.

Pileus horizontal, reniform, even, glabrous, without a viscid pellicle, whitish, or often with a more or less decided rufescent tinge, 1·5–2·5 cm. across; flesh very thin, tough, white; gills adnate and slightly decurrent, closely crowded, narrow, simple, white; spores elliptical, slightly curved, 4 × 2 μ; when young the pileus is spathulate and the stem quite distinct, truly lateral, and up to 1 cm. long, sometimes very short, compressed and broadened towards the pileus, powdered with white squamules.

On fallen branches; on coniferous trees in Europe. Dannevirke, New Zealand. Australia, Europe.

Resembling *Panus stypticus* in habit, form, and size, but differing in its white colour, glabrous pileus, and mild taste.

70. *Pleurotus salignus*, Pers., Syn., p. 478; Austr. Fung., p. 32; Sacc., Syll. v., no. 1405.

Pileus horizontal, at length depressed and strigose behind, margin entire, incurved, pale yellowish-brown or dusky, 5–10 cm. across; gills horizontal, not distinctly decurrent, 3–6 mm. broad, distinct behind, branched midway between base and front, crowded, pale, dingy, margin often broken; spores dingy, elliptic-oblong, slightly curved, 8–10 × 3·5 μ; stem always very short, firm, downy or strigose.

On rotten trunks, stumps, &c. Dannevirke, New Zealand. Australia, Europe, United States.

Not cæspitose. Readily distinguished by the pileus being pulvinate when young, then becoming depressed and strigose, gills thinner and more crowded than usual in the genus, somewhat branching, not anastomosing behind, dingy smoke-colour, as are also the spores (Fries).

†† Pileus white, dry.

71. *Pleurotus sordulentus*, Berk. and Broome, Trans. Linn. Soc., ser. ii., vol. ii., p. 54 (1883); Austr. Fung., p. 35; Sacc., Syll. v., no. 1473.

Pileus horizontal, sessile and attached by the edge or having a short stem-like point of attachment springing from the posterior of the pileus, orbicular or somewhat reniform, dingy-white, at first slightly hairy or strigose, becoming glabrous with age, margin incurved, sometimes lobed, 3–6 cm. broad; gills radiating from the point of attachment, rather broad, thin, ventricose, whitish; spores subglobose, minutely but distinctly warted, 7–8 μ diameter.

On wood. New Zealand. Queensland.

Resembling *Crepidotus mollis* in habit and general appearance, but distinguished by the persistently white gills and spores. The warted spores stamp this species.

72. *Pleurotus scabriusculus*, Berk., Linn. Soc. Journ. (Bot.), vol. xiii., p. 157; Austr. Fung., p. 35; Sacc., Syll. v., no. 1475.

Entirely white. Pileus thin, sessile, horizontal, fan-shaped or semicircular, margin usually more or less lobed, narrowed behind into a very short stem-like point of attachment which is covered with spongy down, surface of pileus (more especially behind) rough with scattered minutely projecting points, not striate, 2–5 cm. broad and about the same long (from base to

margin); gills rather narrow and crowded, radiating from the point of attachment; spores elliptical, 6–7 × 3–3·5 μ.

On logs. Dannevirke, New Zealand. Australia, Admiralty Islands.

Often more or less imbricated. I find the spores to be elliptical, 6–7 × 3–3·5 μ, in the type specimen from Australia and in Colenso's New Zealand specimens. Distinguished among the entirely white species by the scabrid or minutely rough surface of the pileus.

73. *Pleurotus bursæformis*, Berk., Fl. Tasm., ii., p. 245 (1860); Sacc., Syll. v., no. 1487; Cke., Austr. Fung., p. 35.

Pileus almost sessile or narrowed behind into a very short lateral stem-like base, horizontal or the margin drooping, very convex, flesh thin, whitish, downy behind, becoming glabrous towards the margin, 2–5 cm. across; gills slightly decurrent, transversely streaked, pallid; spores dingy-white, subglobose, 6–7 μ diameter.

On dead bark. New Zealand. Tasmania.

74. *Pleurotus guilfoylei*, Berk., Journ. Linn. Soc., v., xiii., p. 158; Austr. Fung., p. 33; Sacc., Syll. v., no. 1409.

Dimidiate or imbricated. Pileus sessile, attached laterally, horizontal, reniform, or semiorbicular, entirely white, even, glabrous, margin incurved, sometimes lobed, tomentose or downy behind near the point of attachment, 2–6 cm. across; gills rather broad and crowded, thin, margin quite entire; spores narrowly elliptical, 7–8 × 3·5 μ.

On logs, &c. Dannevirke, New Zealand. Australia.

Closely superficially resembling *Pleurotus colensoi*, Berk., but sharply distinguished by the narrowly elliptical spores, also other minor characters. A specimen of this species, now in Kew Herbarium, from Richmond River, Australia, was found growing "on the stem of a living *Areca monostachya*."

75. *Pleurotus colensoi*, Berk., in Herb.

Solitary, or more or less imbricated. Pileus sessile, horizontal, thin, entirely white, rather soft, almost or often quite even and glabrous, margin entire or slightly lobed, spreading, reniform or semicircular, 3–6 cm. broad; gills radiating from the point of attachment, rather broad and crowded, thin; spores white, smooth, subglobose, 7–8 × 6 μ.

On logs, &c. Dannevirke, Nelson, New Zealand.

Apparently a common species in New Zealand, having been sent on four different occasions by Colenso; also sent from Nelson by Dall. This species may possibly have been described somewhere by Berkeley, but I have not been able to

find the account. Distinguished by thin substance and entirely white colour.

Pleurotus guilfoylei somewhat resembles the present species, but differs in having the pileus tomentose behind and the margin persistently incurved.

76. *Pleurotus porrigens*, Pers., Obs. Myc., i., p. 54; Sacc., Syll. v., no. 1477.

Entirely white; at first orbicular and resupinate, then ascending or horizontal and becoming more or less tongue-shaped, 5–8 cm. long, 3 cm. broad, sometimes fan-shaped or almost circular, sessile, glabrous, often more or less downy near the base; flesh thin, tough; gills radiating, very narrow, rather crowded; spores broadly elliptical, 6–8 × 4–5 μ.

On stumps. Dannevirke, New Zealand. Europe.

Usually imbricated. Distinguished by the thin substance, narrow crowded gills, and white colour of every part.

77. *Pleurotus flabellatus*, Berk. and Broome, Journ. Linn. Soc. (Bot.), vol. xi., p. 928; Austr. Fung., p. 34; Sacc., Syll. v., no. 1449.

Pileus horizontal, often imbricated, thin and soft, white or more or less tinged reddish-brown, tomentose or downy, becoming glabrous, gradually narrowed behind into a somewhat slender stem-like base, and truly fan-shaped, margin sometimes irregularly lobed, 2–5 cm. long, 2–3 cm. broad; gills radiating from the narrowed base, decurrent, narrow, somewhat crowded, margin entire; spores narrowly elliptical and obliquely apiculate, 5–6 × 3·5 μ; cystidia fusiform, apex rather acute, and rough with particles of oxalate of lime

On dead wood. Dannevirke, New Zealand. Ceylon, Australia, South Africa, Venezuela.

Distinguished from *Pleurotus colensoi* and *P. guilfoylei* by the truly fan-shaped pileus, smaller spores, and the presence of large cystidia in the hymenium, which have the projecting portion covered with particles of oxalate of lime, as in *Peniophora*.

††† Pileus white, cuticle gelatinous.

78. *Pleurotus novæ-zealandiæ*, Berk., Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 602 (as *Agaricus (Pleurotus) novæ-zealandiæ*); Sacc., Syll. v., no. 1456.

Hygrophanous, subgelatinous, white, stem obsolete but attached by a narrowed base which forms a little round disc, smooth in front, minutely scabrous behind, fan-shaped, reniform, 6–8 cm. broad, 3–4 cm. long; gills broad, distant, thin, interstices veiny.

On dead wood. Northern Island, New Zealand.

There is no specimen of this species at present in the Berkeley Herbarium at Kew, hence the original diagnosis cannot be supplemented. Berkeley says the present species is somewhat allied to *Pleurotus versiformis*, from Ceylon.

79. *Pleurotus tasmanicus*, Berk., Flor. Tasm., ii., p. 245; Austr. Fung., p. 36; Sacc., Syll. v., no. 1510.

Pileus reniform or semicircular, horizontal, even, smooth, dingy-white or pallid, invested with a gelatinous stratum, plane, or often depressed, and the margin acute and prominent, 1·5–4 cm. broad, produced behind into a very short tomentose stem-like base, or sessile; flesh 3–4 mm. thick at the base, becoming thinner towards the margin, soft, white, flesh of stem or point of attachment dingy; gills radiating from the point of attachment, rather broad, not crowded, with numerous intermediate ones, dingy-white; spores globose, 4–5 μ. diameter

On rotten wood. New Zealand. Tasmania, Australia.

Distinguished by the species having a gelatinous stratum on the pileus, and by the pallid or dirty-white colour of every part. The pileus is often depressed or concave, and the gills correspondingly convex at maturity.

80. *Pleurotus diversipes*, Berk., Flora Tasm., ii., p. 244, tab. 181, fig. 4; Austr. Fung., p. 86; Sacc., Syll. v., no. 1511.

Pileus circular or more or less excentric, pellucid, dingy-white, smooth, even, invested with a gelatinous stratum, often more or less depressed or umbilicate, horizontal owing to the upward curving of the stem, 3–5 cm across; gills rather decurrent, not very broad nor crowded, not connected by veins, whitish; spores elliptical, 5 × 3–3·5 μ; stem variable in length, up to 3 cm. long, often shorter, somewhat cartilaginous, often compressed, hollow, attached by a flattened or slightly discoid base, whitish.

On rotten logs stumps, &c. New Zealand. Tasmania, Australia.

Distinguished among species having the pileus covered with a gelatinous stratum by the hollow stem, which is sometimes almost central, at others almost lateral, but always inserted within the margin of the pileus; usually curved when the fungus grows from a vertical substratum.

*** Pileus never more than 1 cm. across.*

81. *Pleurotus cocciformis*, Berk., Flora N.Z., ii., p. 174; Hdbk. N.Z. Flora, p. 602 (as *Agaricus (Pleurotus) cocciformis*); Sacc., Syll. v., no. 1486.

Scattered, minute, 3–5 mm. across, sessile, laterally

attached, at first cup-shaped, then with the hymenium downwards; pileus covered with clusters of tawny thick-walled hairs; gills rather close together, narrow, hairy, buff.

On dead and decayed wood. Northern Island, New Zealand.

A minute and curious species; pileus densely covered with thick-walled tawny hairs arranged in fascicles; gills with the component hyphæ running out at the margin and sides into free hairs. Spores not seen. Type specimen examined.

82. *Pleurotus applicatus*, Batsch, fig. 125; Austr. Fung., p. 35; Sacc., Syll. v., no. 1504.

Pileus saucer-shaped and orbicular when young, usually sessile and fixed by the downy base, rarely furnished with a very short rudimentary stem, when adult more or less reflexed, slightly fleshy, striate when moist, minutely pruinose when young, then glabrous or downy, 4–8 mm. across; colour variable, blackish-blue, ashy-grey, or dark-grey; gills radiating from a central or excentric point, scanty, rather thick, broad, distant, grey, the margin usually whitish; spores globose, 4–5 μ diameter.

On rotten wood. New Zealand. Australia, Tasmania, Europe, Siberia, United States, Cuba, Argentine Republic, Island of Juan Fernandez.

Distinguished by the minute species, by the dingy colour of the pileus, grey gills, and by the resupinate habit, having the gills uppermost, and the pileus resting on the substratum.

83. *Pleurotus affixus*, Berk., Decad. Fung., no. 193, in Lond. Journ. Bot., 1848, p. 573; Austr. Fung., p. 34; Sacc., Syll. v., no. 1444.

Densely gregarious; minute, cup-shaped, reflexed and attached by the side, coarsely striate, membranaceous, whitish, 3 mm. broad; gills adnate, thick, ascending, arcuate, rather distant; spores elliptical, 5 × 3; stem very short, smooth, recurved.

On bark of standing trees, &c. New Zealand. Tasmania.

Densely gregarious; covering the bark in broad patches. Readily distinguished by its habit, form, and small size.

24. **Laccaria**, Berk. and Broome.

Pileus thin, regular; gills adnate, white, becoming mealy with the spores; stem central, externally fibrous; spores white, globose, minutely warted.

Laccaria, B. and Br., Ann. Nat. Hist., 1883, p. 370.

Allied to *Clitocybe*, under which genus the species of *Laccaria* were at one time included. Characterized by the broadly adnate gills, which become powdered at maturity

with the large white spherical warted spores. Growing on the ground.

84. *Laccaria canaliculata*, Massee. *Agaricus (Clitocybe) canaliculatus*, Cke. and Massee, Grev., vol. xviii., p. 2; Austr. Fung., p. 17. *Clitocybe canaliculata*, Sacc., Syll., suppl. ix., no. 106.

Pileus thin, dry, subglobose, then expanding, umbilicate, minutely velvety all over, fluted or channelled up to the disc, uniform bright tawny-brown, not much if at all paler when dry, margin crenulate, 1·5–3 cm. diameter; gills adnate, broad, rather distant, flesh-colour or brownish, at length mealy or pruinose with the white spores, which are globose and warted and measure 9–10 μ diameter; stem 2·5–4 cm. diameter, equal, tough, longitudinally fibrillose, paler than the pileus.

On the ground, under trees. Dannevirke, New Zealand. Queensland.

Somewhat resembling *Laccaria laccata*, Berk., but readily separated by the fluted pileus. A single specimen of this species was found mixed with another species in one of Colenso's packets (no. 670B).

85. *Laccaria laccata*, Berk., Grev., xii., p. 70; Brit. Fung.-Flora, ii., p. 443. *Agaricus (Clitocybe) laccatus*, Cke., Austr. Fung., p. 17. *Clitocybe laccata*, Sacc., Syll. v., no. 720.

Pileus thin, convex, then expanded, often more or less wavy and irregular, umbilicate, even, hygrophanous, very minutely and densely squamulose, due to the breaking-up of the cuticle, clear violet or rich brown when moist, whitish when dry, 2–6 cm. across; gills broadly adnate, distant, coloured like the pileus, at length white and mealy with the spores, thick; spores globose, warted, 8–9 μ diameter; stem 5–9 cm. long, 3–4 mm. thick, equal, fibrous, tough, coloured like the pileus, stuffed.

On the ground, in woods. Dannevirke, New Zealand. Australia, Tasmania, Asia, Africa, Europe, United States.

An exceedingly variable, at the same time very marked and distinct, fungus. In some specimens the pileus is clear violet or amethyst when moist, in others a deep rich brown; a white form has also been described. It has been proposed to raise these different coloured specimens to specific rank, but as colour is the only distinctive factor this proposal has not been generally followed. The stem and gills are always coloured like the pileus. Its distinctive features are the umbilicate pileus minutely broken up into squamules and the mealy gills.

25. **Collybia,** Fries.

Pileus regular, usually thin, margin incurved when young; gills adnexed, thin, soft; stem with a cartilaginous cortex, fistulose, often rooting, central; spores white.

Collybia, Fries, Epicr., p. 81 (as a subgenus of *Agaricus*).

Most closely allied to *Marasmius*, which, however, differs in the dry, coriaceous, tough substance of the entire plant and in resuming its shape when moistened after being dried. *Tricholoma* differs in having the stem fibrous outside, and not cartilaginous and polished. *Mycena* differs in the margin of the pileus being straight, and not incurved in the young stage. On the ground.

**Plants solitary or gregarious.*

86. *Collybia radicata*, Relh., Fl. Cant., no. 1040; Austr. Fung., p. 17; Sacc., Syll. v., no. 728.

Pileus convex, then expanded, broadly and obtusely umbonate, often somewhat irregular, glutinous, radiately rugose or wrinkled, but not distinctly and uniformly striate, brownish-olive, ochraceous-brown, sometimes with a greenish tinge, rarely altogether whitish, 3–10 cm. broad; flesh thin, soft, elastic, white; gills adnexed, narrowed behind, often with a minute decurrent tooth, at length separating more or less from the stem, ventricose, distant, rather thick, white; spores elliptical, 14–15 × 8–9 μ; stem 8–17 cm. long above ground, up to 1 cm. thick at the base, from where it becomes gradually thinner upwards, glabrous, but at length more or less longitudinally striate or grooved, the greyish-pallid cartilaginous cuticle often twisted, base fusiformly rooting, descending vertically, often as long as the above-ground portion of the stem.

In woods, &c., among grass; also in open places. New Zealand. Australia, Tasmania, South Africa, Europe, United States.

Readily distinguished by the viscid, radially rugulose pileus, and the long, tapering, polished stem, ending in an equally long, tapering, rooting base.

Collybia longipes, Bull., a species not yet met with in New Zealand, closely resembles the present species in general habit and appearance, but differs in having the pileus and stem very minutely but distinctly velvety.

87. *Collybia xanthopoda*, Fries, Epicr., p. 91; Austr. Fung., p. 20; Sacc., Syll. v., no. 836. *Agaricus (Collybia) xanthopus*, Fries, *loc. cit.*

Pileus thin, campanulate-convex, then expanded, sometimes rather wavy, umbonate, glabrous, dry, tan-colour, becoming pale, margin at length spreading and slightly

striate, 2·5–5 cm. across; gills adnexed at first, soon free, truncate behind, crowded, very broad, lax, whitish; spores elliptical, 6–7 × 4 μ; stem 6–10 cm. long, 4–6 mm. thick, tough, hollow, equal, even, glabrous, tawny-yellow; base rooting, strigose.

On the ground, in forests, &c. Dannevirke, New Zealand. Australia, Europe.

Allied to *Collybia dryophila*, but separated by the umbo, very broad gills, and strigose rooting base of the stem.

88. *Collybia nummularia*, Bull., Champ. France, t. 56; Austr. Fung., p. 20; Sacc., Syl. v., no. 839.

Pileus dry, flesh thin, soon almost plane and slightly depressed round the small umbo, even, glabrous, pallid or whitish, often variegated with red or yellow stains, 2–3·5 cm. across; gills free, broadest behind, rather distant, white; spores 4–5 × 3 μ; stem 3–6 cm. long, about 2 mm. thick, often slightly thinner downwards, pallid, stuffed, then hollow.

Among fallen leaves, in woods, &c. Dannevirke, New Zealand. Australia, Europe.

Distinguished by being altogether white or pallid, although the pileus is usually more or less stained with red or yellow, and by the pale pileus being depressed round the small obtuse umbo.

89. *Collybia dryophila*, Bull., Champ. France, t. 434; Austr. Fung., p. 20; Sacc., Syll. v., no. 871.

Pileus convex, then plane, obtuse, centre usually depressed, even, glabrous, dry, reddish-bay or pale-tan, becoming pale, but not hygrophanous, margin incurved at first, then expanded, 2·5–5 cm. across; flesh thin, white, flexible; gills almost free, with a minute decurrent tooth, but appearing as if adnexed when the pileus is depressed, crowded, narrow, distinct, plane, white or pallid; spores elliptic-fusiform, 7–8 × 4 μ; stem 2·5–5 cm. long, 2–4 mm. thick, cartilaginous, distinctly hollow, even, glabrous, somewhat rooting, base often swollen when growing in damp places among leaves, usually yellowish or rufescent.

On the ground, among fallen leaves, on rotten wood, &c. Dannevirke, New Zealand. Ceylon, India, Australia, South Africa, Europe, United States.

Solitary or loosely gregarious, inodorous, very variable. Distinguished from its nearest allies by the narrow crowded gills and the obtuse pileus. (See note under *C. xanthopoda*.)

90. *Collybia distorta*, Fries, Epicr., p. 84; Sacc., Syll. v., no. 760; Brit. Fung.-Flora, iii., p. 124.

Pileus convex, then expanded, often irregular and wavy,

umbonate, even, glabrous, bay, becoming pale, but not hygrophanous, 5–8 cm. across; flesh thin, whitish, flaccid; gills slightly adnexed, closely crowded, rather narrow, margin scarcely serrulate, white, then becoming spotted and stained with red; spores elliptical, 6–7 × 4 μ; stem 6–10 cm. long, about 1 cm. thick, becoming thinner upwards from the tomentose or downy base, twisted, sulcate or grooved, externally cartilaginous, pallid, fragile, spongy inside and soon becoming hollow.

On rotten trunks, heaps of leaves, &c. Dannevirke, New Zealand. Europe.

Collybia fusipes somewhat resembles the present species, and might be mistaken for it on a superficial examination. It is, however, quite distinct in the broad distant gills connected by veins, the distinctly fusiform rooting stem, and in being more cæspitose or tufted in habit.

*** Plants cæspitose or tufted.*

91. *Collybia velutipes*, Curtis, Flor. Lond., iv., t. 73; Austr. Fung., p. 127; Sacc., Syll. v., no. 773.

Pileus convex, then expanding until almost plane, sometimes with an indication of an umbo, smooth, even, very viscid, bright-yellow, disc tawny, or sometimes altogether yellowish-brown, 3–8 cm. across; flesh thickish at the disc, becoming very thin towards the margin, tinged yellow; gills adnexed, rather distant, ventricose, cut out behind, 4–6 mm. broad, pale opaque-yellow, margin entire; spores elliptical, 7 × 3–3·5 μ; stem 5–10 cm. long, 6–8 mm. thick, almost equal, narrowed below into a rooting base, apex yellowish, then orange-brown, becoming darker downwards, minutely velvety, stuffed.

On trunks, logs, &c. Dannevirke, New Zealand. Australia, Europe, Siberia, United States.

Readily distinguished by the bright-yellow viscid pileus and the dark minutely velvety stem. Tufted. One of the few species of the *Agaricini* capable of growing in very cold weather, and in Britain may often be seen quite vigorous after having experienced 6° of frost for several nights in succession.

92. *Collybia laccatina* (Berk.), Sacc., Syll. v., no. 807. *Agaricus (Clitocybe) laccatinus*, Berk., Journ. Linn. Soc. (Bot.), xviii., p. 383; Austr. Fung., p. 17. *Laccaria laccatina*, Berk., Grev., xii., p. 70.

Cæspitose. Pileus subglobose, then expanding until plano-convex, thin, glabrous, margin sulcate, pale fleshy-red or brownish red, 1–2 cm. across; gills adnate, distant, thick, coloured like the pileus but not such a deep tint, mealy with the spores, which are elliptical and measure 5 × 3 μ; stem

1·5–3 cm. long, 2 mm. thick, fibrillose, paler in colour than the pileus.

On dead logs, &c. Dannevirke, New Zealand. Australia.

Berkeley was mistaken in considering the present species as belonging to his genus *Laccaria*, as I have examined his type specimen, also Colenso's New Zealand specimens, both of which have elliptical spores, as described above. Cooke evidently did not examine Berkeley's specimens, but copied his mistake, and printed it in Austr. Fung, p. 17.

93. *Collybia lacerata*, Lasch, in Fries's Hym. Eur., p. 127 (1874); Cke., Hdbk. Austr. Fung., p. 21; Sacc., Syll. v., no. 918.

Pileus campanulate, rather obtuse, moist, sooty-brown, at length pale, or streaked with dark-brown on a pale ground, disc darker, about 3 cm. across; gills adnexed, distant, broad, thick, greyish-white; stem 5–10 cm. long, 4–5 mm. thick, equal, firm, twisted, fibrillosely striate, apex floccosely pruinose, at length compressed, stuffed, then hollow.

On the ground, near trunks, in pine woods, &c. New Zealand. Victoria, Europe.

94. *Collybia acervata*, Fries, Epicr., p. 92; Sacc., Syll. v., no. 869.

Pileus convex, then expanded, obtuse or at length obtusely umbonate or gibbous, pale flesh-colour when moist, whitish when dry, margin at first incurved, then expanded and slightly striate, 5–8 cm. across; flesh thin, rather flexible; gills adnexed at first, soon free, very closely crowded, narrow, plane, tinged flesh-colour, then whitish; spores elliptical, 7–8 × 3·5 μ; stem 5–10 cm. long, 2–4 mm. thick, rigid, fragile, hollow, slightly thinner upwards, rarely flattened, very glabrous except at the base, even, rufous or brown, wall of cavity of stem glabrous.

On trunks, &c. New Zealand. Europe, South Africa.

Care must be taken not to confound the present species with *Marasmius erythropus*. (See note under the last-named fungus.)

26. **Mycena**, Fries.

Pileus thin, regular, campanulate, then expanded, usually striate, margin at first straight and embracing the stem; gills adnate or adnexed, white, grey, or pinkish; stem central, slender, hollow; spores white.

Mycena, Fries, Syst. Myc., i., p. 140 (as a subgenus of *Agaricus*).

The species are as a rule small and slender; colours clear

and bright; gills often coloured, but the spores are in all cases white, and in one group the edge of the gills is coloured. Latex, white, red, or saffron, is present in some species, and escapes in drops when the fungus is broken. Allied to *Collybia*, which differs in having the margin of the pileus incurved when quite young. Most species grow on the ground; a few on wood, twigs, &c.

95. *Mycena galericulata*, Scopoli, Carn., 445; Austr. Fung., p. 23; Sacc., Syll. v., no. 1002.

Pileus conical, then campanulate, at length expanded, thin and somewhat flexible, umbonate, dry, glabrous, rather coarsely striate up to the umbo, greyish, often with a more or less decided brown tinge, 2–5 cm. across; gills adnate, with a decurrent tooth, about 1 mm. broad, connected by veins, white, becoming tinged with pink when old or dry; spores $6–7 \times 4\ \mu$; stem variable in length, 5–10 cm., 2–5 mm. thick, equal, rigid, even, polished, pallid; base tapering and often rooting, densely strigose, hollow.

On trunks and stumps. New Zealand. Australia, Tasmania, Europe, United States.

Solitary, or more frequently tufted; sometimes growing on the ground, probably springing from buried wood.

Most closely allied to *Mycena rugosa*, a species not yet found in New Zealand. The latter, however, differs in having the pileus radially wrinkled or rugulose nearly up to the disc, but not distinctly striate; the stem is also shorter and compressed; finally, the gills are greyish-white without a trace of pink when old.

96. *Mycena epipterygia*, Scopoli, Carn., p. 453; Brit. Fung.-Flora, iii., p. 86; Sacc., Syll. v., no 1109.

Pileus membranaceous, campanulate, obtuse, becoming more or less expanded, never truly depressed, striate, covered with a pellicle that is very viscid in wet weather and easily separable in every atmospheric condition, colour variable, usually grey, or often pale yellowish-green near the margin, which is often minutely notched when young, 1–2·5 cm. across; gills adnate, with a decurrent tooth, thin, whitish or with a tinge of grey; spores elliptical, $8–10 \times 4–5\ \mu$; stem 5–10 cm. long, about 2 mm. thick, hollow, tough, often wavy, base rooting and fibrillose, even, viscid, usually yellowish but sometimes grey, pallid, or whitish.

On branches, twigs, among moss, &c. New Zealand. Europe, Siberia, United States.

Solitary or clustered. Colour variable, but readily known by the viscid pileus and stem, both being furnished with a slimy separable pellicle.

97. *Mycena filipes*, Bull., t. 230; Austr. Fung., p. 24; Sacc., Syll. v., no. 1064.

Pileus membranaceous, conical, then campanulate, at length expanded, obtuse, striate, greyish-brown or livid-grey, rarely whitish, glabrous, 1–1·5 cm. across; gills free or very slightly adnexed, narrow, ventricose, crowded, white; stem 6–10 cm. long, very slender, equal, rather fragile, flaccid, glabrous, whitish, base rooting, fibrillose, hollow.

Among fallen leaves, in damp shady places. New Zealand. Australia, Ceylon, India, Europe, United States.

Fragile. Distinguished among the small delicate species of *Mycena* by the very slender elongated stem, terminating in a long downy rooting base, which runs between the dead leaves, &c., on which the fungus grows.

98. *Mycena hiemalis*, Osbeck, in Retz., suppl. ii., p. 19; Austr. Fung., p. 26; Sacc., Syll. v., no. 1148.

Pileus very thin, campanulate, slightly umbonate, margin striate, flesh-colour, rufescent, or white, often mealy or pruinose, 4–6 mm. across; gills uncinately-adnate, narrow, whitish; spores narrowly elliptical, 7–8 × 3·5 μ; cystidia absent; stem 1·5–2·5 cm. long, slender, curved and downy near the base, whitish.

On trunks of trees, among moss and lichens. New Zealand. Australia, Europe, Central America, Cuba.

Superficially, closely resembling *Mycena corticola*, with which it sometimes grows intermixed, but separated by its more scattered habit, longer stem, and more especially by the elliptical spores and absence of cystidia in the gills.

99. *Mycena corticola*, Fries, Syst. Myc., i., p. 159; Sacc., Syll. v., no. 1147; Austr., Fung., p. 25.

Pileus very thin and delicate, hemispherical, obtuse, at length more or less umbilicate, deeply and distantly striate, glabrous, or flocculosely pruinose or mealy, 4–7 mm. across; colour very variable, blackish, bluish, brown, or grey; gills adnate, with a slight decurrent tooth, broad, somewhat ovate, pallid; spores globose, hyaline, smooth, 9–10 μ diameter; cystidia obtusely fusiform, 50–60 × 8–10 μ; stem about 1 cm. long, very slender, glabrous or minutely scurfy, paler than the pileus, incurved, minutely fistulose.

On bark of living trees, among moss and lichens. Dannevirke, New Zealand. Australia, Europe, United States.

Closely allied to *Mycena hiemalis*, but readily distinguished by the globose spores, the presence of cystidia in the broad ovate gills, and the densely gregarious habit.

27. **Tricholoma**, Fries.

Pileus regular, fleshy; gills broad, sinuate behind, margin entire, white, grey, or yellowish, often becoming spotted with rust-coloured stains; stem stout, central, fibrous throughout; spores white.

Tricholoma, Fries, Syst. Myc., i., p. 36 (as a subgenus of *Agaricus*).

All the species grow on the ground, and most are fleshy and robust. The sinuate gills mark the genus among white-spored forms.

100. *Tricholoma rutilans*, Schæffer, tab. 219; Sacc., Syll. v., no. 344.

Pileus ovato-globose, obtuse, with the margin incurved, and entirely covered with a dense unbroken coating of dark-purple or reddish-brown velvety nap, when young; when older becoming campanulate and often umbonate, purple, all one colour; at maturity expanded, often umbonate, the cuticle broken up into small purple innate fascicles of down on a yellow ground; always dry, 6–14 cm. diameter; flesh thick, soft, deep-yellow from the earliest stage, becoming golden-yellow when broken; gills broadly adnexed, yellow from the first, crowded, edge thickened, floccose, and deeper yellow than the rest of the gill; spores subglobose, 5–6 μ diameter; stem 5–9 cm. long, up to 2 cm. thick, fleshy, imperfectly hollow, soft, rather bulbous when short, ventricose when elongated, yellow, variegated, especially upwards, with purplish floccose squamules.

On the ground. New Zealand. Australia, Europe, United States.

Inodorous; size very variable. Readily distinguished by the yellow flesh and gills.

101. *Tricholoma terreum*, Schæffer, tab. 64; Sacc., Syll. v., no. 373.

Pileus campanulate, then expanded, umbonate, entirely covered with innate downy squamules, dark bluish-grey, sometimes with a tinge of brown, 5–8 cm. across; flesh soft, thick at the disc, elsewhere thin, soft; gills adnexed and cut out behind or sinuate, with a minute decurrent tooth, 4 mm. or more broad, greyish-white, margin crenulate or slightly irregular; spores subglobose, 5–6 mm. diameter; stem 2·5–7 cm. high, 1–1·5 cm. thick, almost equal, adpressedly fibrillose, whitish, stuffed.

In woods, on the ground. New Zealand. Europe.

Solitary or cæspitose, almost without smell, sometimes large and with the pileus wavy and fibrillosely squamulose,

sometimes small and regular in form; pileus papillate and also squamulosely punctate. Pileus grey, bluish, fuscous, &c.

102. *Tricholoma cartilagineum*, Bull., Champ. France, t. 589, fig. 2; Sacc., Syll. v., no. 383; Hdbk. N.Z. Flora, p. 601.

Pileus convex when young, obtuse, margin incurved and downy, then expanded and usually wavy, arched or bent down near the margin, which is persistently incurved; always very dry; flesh rather thick, rigid, white, 5–9 cm. across, densely covered with minute black granules on a white ground; gills emarginate and sinuate, crowded, thin, about 4 mm. broad, white, then grey, but not dingy; stem 2·5–5 cm. long, firm but fragile, stout, up to 2·5 cm. thick, pure white, surface even, glabrous, polished; spores globose, 7–8 μ diameter.

On the ground, in beech forests, amongst moss. Middle Island, New Zealand. Europe.

Readily distinguished by the character of the pileus, pure-white stem, and grey gills.

103. *Tricholoma brevipes*, Bull., Champ. France, t. 521, fig. 2; Sacc., Syll. v., no. 584. *Agaricus (Tricholoma) brevipes*, Hdbk. N.Z. Flora, p. 601.

Pileus convex then flattened, the umbo soon disappearing, blackish-umber or brown, becoming paler, glabrous, 3–8 cm. across; flesh thick, brownish when moist, almost white when dry; gills emarginate, crowded, ventricose, at first with a brown tinge, then whitish, 2–4 mm. broad; stem short and stout, up to 2·5 cm. long, firm, rigid, somewhat thickened at the base, 1·5 cm. thick above, solid, brown outside and inside; spores elliptical, 7 × 4 μ.

On the ground. Northern Island, New Zealand. Europe.

Distinguished by the very short more or less bulbous stem, which is solid, and brown both inside and outside.

104. *Tricholoma carneum*, Bull., Champ. France, tab. 533; Sacc., Syll. v., no. 425.

Pileus hemispherical, then convex, regular, obtuse, at length expanded and upturned, often umbonate, usually wavy, and sometimes excentric, even, glabrous, dry, not at all hygrophanous, reddish flesh-colour, at length whitish, about 2·5 cm. across; flesh thin, tough, snow-white; gills rounded behind and almost free, horizontal, closely crowded, broadest behind, 2–3 mm. broad, pure white; stem up to 2·5 cm. long, sometimes very short, 2–4 mm. thick, apex thickest, and narrowing gradually towards the base, pale reddish-pink, becoming almost white, apex somewhat pruinose, tough and fibrous, almost cartilaginous, rigid, stuffed, then hollow.

Among grass, in woods, &c. Middle Island, New Zealand. Europe.

Agreeing with the genus *Collybia* in general habit and structure of the stem, but retained in *Tricholoma* on account of its evident affinity with such species as *Tricholoma pæonium* and *T. ionides*.

28. **Armillaria,** Fries.

Pileus regular, fleshy; gills adnate or sometimes slightly decurrent; stem central, furnished with a ring; spores white.

Armillaria, Fries, Syst. Myc., i., p. 26 (as a subgenus of *Agaricus*).

All white-spored Agarics with gills touching the stem, and a ring or annulus on the stem, belong to the present genus. *Lepiota* differs in having the gills free from the stem. On branches or on the ground, round decaying stumps.

105. *Armillaria mellea*, Vahl, Flor. Dan., t. 1013; Austr. Fung., p. 11; Sacc., Syll. v., no. 289.

Pileus 5–12 cm. across, disc fleshy, remainder thin, convex then expanded, often becoming more or less depressed at the centre, often sooty or covered with olive down when young, soon paler; usually ochraceous with a tinge of honey-colour, sprinkled all over with small spreading blackish-brown scales, margin striate; gills adnate, then becoming more or less decurrent, rather distant, white with a pink tinge, then brownish and powdered with the white spores; stem 6–12 cm. long, 1–1·5 cm. thick, rigid, more or less grooved, dingy-ochraceous, floccose or almost naked below the ring, base often covered with yellowish down, stuffed, then hollow, elastic, ring near the apex; spores elliptical, 9 × 5–6 μ.

At the base of trunks or on the ground, springing from buried wood. Maungaroa, New Zealand. Europe, North America, South America, Australia, India.

Usually densely tufted, although sometimes solitary, and then usually larger; very variable; stem and pileus often quite glabrous, especially when old. A very destructive parasite to timber trees in Europe, the black cord-like strands of mycelium running between the wood and the bark, also travelling in the ground from one tree to another. These strands of mycelium were at one time considered as constituting a distinct genus of Fungi called *Rhizomorpha*.

29. **Lepiota,** Fries.

Pileus regular, usually scaly; gills free from the stem, white or tinted; stem central, bearing a ring; spores white or dingy.

Lepiota, Fries, Syst. Myc., i., p. 19 (as a subgenus of *Agaricus*).

Free gills and a ring on the stem are the important features of the present genus. In some species the ring disappears soon after the pileus expands. On the ground.

106. *Lepiota exstrucata*, Berk., Flora N.Z., ii., p. 173; Hdbk. N.Z. Flora, p. 601 (as *Agaricus (Lepiota) exstrucatus*); Sacc., Syll. v., no. 197.

Pileus rather fleshy, campanulate, then expanding, white, surface broken up into warts or concentrically arranged, more or less overlapping, thick scales, white, 2·5–3·5 cm. high, 4–6 cm. broad when expanded; gills very distant from the stem, rather crowded and narrow, white with a tinge of pink; spores hyaline, broadly elliptical, ends very obtuse, smooth, 14-15 × 10 μ; stem 7–10 cm. high, slightly thickened at the base, pallid, ring ample, superior.

In meadows, &c. Bay of Islands, Auckland, New Zealand.

A very beautiful endemic species. Examination of Berkeley's type specimen, supplemented by others accompanied by notes and sketches, has enabled me to complete the description. Belongs to the *procerus* group, and is in all probability edible.

107. *Lepiota clypeolaria*, Bull., Champ. France, t. 405, f. 2 (as *Agaricus*); Flora N.Z., ii., p. 173; Hdbk. N.Z. Flora, p. 601; Austr. Fung., p. 6; Sacc., Syl. v., no. 101.

Pileus at first obtusely cylindrical, even, apex tawny, surface silky and soft but not at all broken up, then campanulately expanded, umbo tawny, the remainder entirely broken up into very soft tan-coloured small scales concentrically arranged, 4–7 cm. across; flesh thickish, soft, white; gills free but close to the stem, up to 5 mm. broad, soft, crowded, white or tinged yellow; spores elliptical, 6 × 4 μ; stem about 8 cm. long, 5–6 mm. thick, soft, fragile, equal or slightly thickened at the base, at first with spreading scales from the breaking-up of the yellowish veil, becoming almost naked, pallid, and fibrillose, striate above the ring, stuffed, then hollow.

On the ground, in woods, &c. Northern Island, New Zealand. Europe, United States.

Characterized by the gills being close to the stem, the concentrically squamulose pileus, and scaly stem. Its nearest ally, *L. cristata*, is not yet recorded for New Zealand. The pileus is variable in colour, white, pink, rufous, brown, &c.

108. *Lepiota mesomorpha*, Bull., Champ. France, tab. 506, fig. 1; Austr. Fung., p. 9; Sacc., Syll. v., no. 165.

Pileus thin, campanulate, then expanded, the margin sometimes slightly turned up, often more or less umbonate, dry, even, glabrous, yellowish, or pale yellow-brown, about 2 cm.

across; gills free, about 1 line broad, ventricose, clear white; spores elliptical, 5–6 × 3 μ; stem 2·5–3·5 cm. long, about 2 mm. thick, equal, dry, even, glabrous, paler than the pileus, fistulose; ring superior, persistent, erect, whitish.

On the ground. New Zealand. Australia, Europe.

Readily distinguished by the even and glabrous pileus and stem—very exceptional features in *Lepiota*—and the entire, erect, persistent ring.

30. **Amanita,** Fries.

Entire fungus at first enclosed in a universal veil which is ruptured during growth, one portion remaining as a volva or sheath at the base of the stem, the remainder forming separable patches or warts on the pileus; gills free, white; stem central, bearing a ring; spores white.

Amanita, Fries, Syst. Myc., i., p. 12 (as a subgenus of *Agaricus*).

Gills free, stem with a volva and ring, are the essentials constituting the genus *Amanita*. *Lepiota* differs in the absence of a volva sheathing the base of the stem. All grow on the ground.

109. *Amanita phalloides*, Fries, Syst. Myc., i., p. 13; Flora N.Z., ii., p. 173; Hdbk. N.Z. Flora, p. 601; Sacc., Syll. v., no. 7.

Pileus ovate, then campanulate, finally expanded, obtuse, covered with a pellicle that is viscid when moist but not glutinous, rarely with one or more patches of the volva attached, margin regular, even, colour very variable, usually white or pale-yellow when exposed to light, greenish or with an olive tinge or often spotted when in the shade; flesh rather thick, white; 7–11 cm. across; gills free, ventricose, 6–8 mm. broad, pure white; stem 8–12 cm. long, 1·5–2 cm. thick, almost glabrous, white bulbous, solid at the base, hollow and slightly narrowed upwards, often curved; ring superior, large, reflexed, slightly striate, tumid, usually entire, white; volva more or less buried in the ground, nearly free, lateral margin irregular; spores subglobose, 7–8 μ diameter.

In woods. Northern Island, New Zealand. Europe, Australia, United States.

Distinguished by the large nearly free volva and ample ring. Smell not strong, but unpleasant. Very poisonous. The majority of cases of poisoning caused by Fungi in Europe are due to partaking of this species for food.

Amanita mappa, a species superficially much resembling *A. phalloides*, is distinguished from the latter by the volva being adnate to the base of the stem, except a narrow free entire margin. Poisonous.

110. *Amanita mappa*, Fries., Epicr, p. 4 (1836); Sacc., Syll. v., no. 8; Cke., Habk. Austr. Fung., p. 2.

Pileus 6–10 cm. across, rather fleshy, convex, then almost plane, dry, pale-yellow, sometimes whitish or with a tinge of green, with a few irregular patches of the volva adhering; gills slightly adnexed, rather narrow, crowded, white; stem 5–8 cm. long, smooth, white, equal, globosely bulbous at the base; ring superior, soft, usually more or less torn; volva splitting in a circumscissile manner, connate with the base of the stem, free margin narrow; spores subglobose, 7–9 μ diameter.

On the ground. North Island. Europe, North America.

Smell strong, colour variable. A very poisonous fungus. Allied to *Amanita phalloides;* differing in the shorter equal stem and narrow free margin of the volva.

31. **Xerotus**, Fries.

Pileus dry, tough, thin; gills slightly decurrent, coriaceous, narrow, often forked, margin entire, rather blunt or thickened; stem central or excentric; spores white.

Xerotus, Fries, Epicr., p. 48.

Resembling *Cantharellus* in the thick margin of the gills, but differing in the thin tough or coriaceous consistence of every part of the fungus. Most of the species become blackish when dried. Growing on wood, twigs, &c.

111. *Xerotus glaucophyllus*, Cke. and Massee, Grev., vol. xx., p. 120; Sacc., Syll., suppl. xi., no. 269.

Pileus sessile, very thin, horizontal, fan-shaped or irregularly circular in outline, margin sometimes slightly lobed, attached laterally, glabrous, more or less fluted, extreme edge often upturned, dusky (when dry), 1·5–2·5 cm. across; gills few, distant, broad, with shorter intermediate ones radiating from the point of attachment, pale brick-red, then becoming glaucous with the white globose spores, which are about 6 μ diameter.

On slender twigs. New Zealand.

Distinguished by the broad gills and the extreme margin of the pileus upturned, at least when dry. The species of *Xerotus* are remarkable for becoming dingy in colour and, in many instances, black when dry.

111A. *Xerotus drummondi*, Berk., MS.; Austr. Fung., p. 100.

Gregarious. Pileus horizontal, laterally attached by a thickened stem-like point but sessile, reniform, or almost circular, very thin, flexible when dry, glabrous or minutely cracked under a lens, rust-colour or dark-red, almost even,

margin often more or less lobed, the extreme edge drooping and held down by the gills, about 1 cm. across; gills distant, radiating from the persistently pale thickened point of attachment of the fungus to its support, rather distant, broadest in front, not usually connected by veins, becoming blackish; spores dingy, subglobose, 4–5 μ diameter.

On small twigs and branches. New Zealand. Australia.

In some of Drummond's specimens the pretty cockle-shell-shaped pilei are crowded on the branches. There are fine specimens from New Zealand in Berkeley's herbarium. Distinguished by the reddish pileus and very thin flexible flesh.

32. **Marasmius,** Fries.

Pileus regular, thin, tough and pliant; gills pliant, somewhat distant, variously attached or quite free, edge thin, entire, often connected by transverse bars or veins; stem central, slender, cartilaginous or hoary, minutely velvety or polished; spores white.

Marasmius, Fries, Epicr, p. 372.

A very distinct genus, but distinguished more especially by biological characters. Differing from *Collybia* and *Mycena*, its nearest allies, by not deliquescing at maturity, but drying up, and again assuming the original form when moistened. Many species have a smell resembling garlic. On the ground, among dead leaves, some on branches, &c.

112. *Marasmius erythropus*, Fries, Epicr., p. 378; Austr. Fung., p. 83; Sacc., Syll. v., no. 2051.

Pileus convex, then plane, glabrous, obtuse, hygrophanous, pallid, disc darker, wrinkled or rugulose and almost white when dry, about 2·5 cm. across; flesh thin, rather flexible; gills almost free, broad, distant, soft and elastic, connected by veins, whitish, margin quite entire; spores 8–10 × 5–6 μ; stem 5–10 cm. long, about 4 mm. thick, hollow, firm, tough, round or becoming flattened more or less, blackish-red, glabrous upwards and paler at first, rather pruinose when dry, furnished with white strigose down near the base, inside wall of the hollow stem downy.

In woods, among fallen leaves; rarely on trunks. New Zealand. Australia, Europe, United States.

Scattered or in small clusters. Rather closely resembling *Collybia acervata*, but distinguished by the broad distant gills.

113. *Marasmius caperatus*, Berk., Flora N.Z., ii., p. 175; Hdbk. N.Z. Flora, p. 605.

Entirely snow-white; pileus membranaceous, wrinkled

and corrugated, smooth, 2–3 cm. across; gills distant, adnate, rather broad, connected by prominent ribs; spores elliptical, 5 × 3 μ; stem up to 1 cm. long, slender, furfuraceous.

On dead wood. Wairarapa, Northern Island, New Zealand. Himalayas.

Distinguished by the membranaceous substance, pure-white colour, and the prominent ribs on the inside of the pileus connecting the gills. Tough. Type specimen examined.

114. *Marasmius impudicus*, Fries, Epicr., p. 277; Austr. Fung., p. 84; Sacc., Syll. v., no. 2057.

Smell strong and very unpleasant; pileus convex, then plane, the centre often depressed, reddish-bay, pale when dry, 1·5–2·5 cm. across when expanded; flesh thin, soft and pliant, membranaceous from the margin half-way up and coarsely striate; gills at first slightly adnexed, but becoming free during the expansion of the pileus, connected by veins, ventricose, at first crowded then distant, white with just a suspicion of pink; spores elliptical, 8 × 4–5 μ; stem 3–5 cm. long, 2 mm. thick, equal, slightly wavy or flexuous, tough, rufous or rufous-brown or sometimes purple-violet, naked, but entirely covered with delicate white down when dry, base narrowed and rooting.

On or about rotten trunks and stumps, especially pine. New Zealand. Australia, Europe.

Gregarious. Agreeing with *Marasmius fœtidus* and *M. perforans* in the strong fœtid smell. The last two named, however, differ from the present in having the stem minutely but distinctly velvety.

115. *Marasmius vaillantii*, Fries, Epicr., p. 330; Sacc., Syll. v., no. 2072.

Pileus thin, pliant, at first convex, soon flattened and more or less depressed at the disc, marked with radiating ridges, whitish, 1·5–2·5 cm. across when expanded; gills adnate, but from their triangular form appearing somewhat decurrent, broad, distant, distinct, simple, white; spores elliptical, 10 × 6 μ; stem about 2·5 cm. long, thickened upwards, glabrous, bay, shining, apex paler, base blackish, naked, penetrating the substance upon which it is growing.

On dead wood, fallen twigs, leaves, &c. Dannevirke, New Zealand. Europe, United States.

Inodorous. Small, tough, dry. *Marasmius impudicus* differs in the purplish stem becoming covered with white velvety down when dry.

116. *Marasmius hæmatocephalus*, Montag., Syll. Crypt., no. 351 (1856); Sacc., Syll. v., no. 2143.

Pileus very thin, campanulate, then convex, finally almost plane, plicate, margin crenate, glabrous, deep-red, up to 1 cm. across; gills narrowly adnexed, distant, pallid; stem 3–5 cm. long, very slender, equal, horny, umber or blackish, expanded at the base into a minute pallid disc.

On fallen leaves, wood, &c. New Zealand. Victoria, Ceylon, Surinam, Brazil, Guiana, Cuba, United States.

Readily distinguished by the deep-red colour of the plicate or fluted pileus, and the dark hair-like stem.

117. *Marasmius insititius*, Fries, Epicr., p. 386; Sacc., Syll. v., no. 2231.

Pileus membranaceous, pliant, convex, then plane, often slightly umbilicate, not polished, at length coarsely grooved or plicate, pale yellowish-brown, becoming whitish, 1–1·5 cm. across; gills broadly adnate, becoming narrower in front, distant, simple, unequal, pallid, then white; spores $4 \times 2{\cdot}5\,\mu$; stem 2–3 cm. long, thin, equal, horny, minutely floccose or scurfy, fistulose, slightly attenuated at the base and abruptly piercing the matrix, coloured like the pileus, or sometimes whitish.

On dead fallen leaves and twigs. Dannevirke, New Zealand. Europe, United States.

Distinguished from allies by the coarsely grooved pileus and scurfy stem.

118. *Marasmius subsupinus*, Berk., Flora Tasm., ii., p. 249; Austr. Fung., p. 88; Sacc., Syll. v., no. 2260.

Pileus almost membranaceous, convex, erect at first, then frequently upturned with the gills uppermost, rather wrinkled, mealy, whitish, or tinged brown, 0·5–1 cm. diameter; gills adnexed, rather broad, few in number, rather thick and rigid, plane, not connected by veins; spores pip-shaped, $7 \times 4\,\mu$; stem 2–3 mm. long, slender, mealy.

On dead stems of *Rhipogonum*. Pohangina River, New Zealand. Tasmania, Australia.

Sometimes growing horizontally with the pileus uppermost, and standing out from the matrix like one valve of a tiny bivalve shell. Gregarious.

119. *Marasmius inversus*, Massee, sp. nov.

Gregarious or scattered. Pileus membranaceous, dry, reniform or almost circular, brownish or dingy-ochraceous, almost even and glabrous, usually inverted, so that the gills are

uppermost and the pileus in contact with the substratum, 3–6 mm. across; gills adnate, distant, rather broad, sometimes forked, shorter intermediate ones present, scarcely or not at all connected by veins, pale yellowish-buff when dry; spores elliptical, 6–7 × 4 μ; stem lateral or nearly so, short, slender, coloured like the pileus, arched and standing above the pileus when the latter is inverted.

On slender branches and twigs, lying on the ground. New Zealand.

A minute but very interesting species, sent to Kew by Colenso (no. b, 563), and was at the time referred to *Marasmius spaniophyllus*, Berk., from which species it is indeed truly distinct. The last-named species must therefore be removed from the list of New Zealand Fungi. Readily distinguished by its small size and peculiar inverted habit of growth.

33. **Panus**, Fries.

Entirely coriaceous, tough, drying up. Pileus irregular, stipitate, sessile, horizontal or resupinate; gills more or less decurrent, margin thin, quite entire; stem excentric, lateral, or entirely absent; spores white.

Panus, Fries, Epicr., p. 396.

Allied to *Lentinus* in the tough coriaceous substance, but at once distinguished by the gills having the margin or edge quite entire. On wood.

120. *Panus maculatus*, Berk., Flora N.Z., p. 176; Hdbk. N.Z. Flora, p. 606; Sacc., Syll. v., no. 2577.

Closely imbricated or overlapping. Pilei reniform, convex, at first innato-tomentose, the cuticle cracking up into shortly reflexed scales, at length quite smooth; margin slightly involute; stems connate, scarcely visible except in young pilei; gills rather distant, decurrent, broad, wavy when dry, margin quite entire; spores hyaline, oblong, about 8 μ long.

On dead trunks. Northern Island, New Zealand.

The scales arise from the cracking of the cuticle, in consequence of which a slight portion is reflected in front, while that behind is not at all disturbed. Ample. (Berk.)

121. *Panus incandescens*, Berk. and Broome, Trans. Linn. Soc., ser. ii., vol. ii., p. 55; Austr. Fung., p. 96; Sacc., Syll. v., no. 2451.

Entirely whitish or dingy; pileus varying from umbilicate to deeply funnel-shaped, glabrous, but very minutely wrinkled or virgate, margin persistently incurved, 4–10 cm. across, often very irregular in form; flesh thick at the disc, whitish, tough;

gills deeply decurrent and running as very fine lines almost to the base of the stem, thin, narrow, rather crowded; spores $7 \times 4\,\mu$; stem 2–4 cm. high, up to 8 mm. thick, slightly narrowed downwards.

On logs, or on the ground, springing from buried wood. New Zealand. Australia.

Remarkable for being very luminous at night. Tufted and often irregular; variable in size.

122. *Panus tahitensis*, Reichardt, Novara Exped., p. 142; Sacc., Syll. v., no. 2555.

Pileus reniform, plano-convex, quite glabrous, margin quite entire, incurved, base depressed, whitish, then tan-colour, coriaceous and tough, 6–7 cm. broad; gills not decurrent, firm, crowded, ochraceous-white, then becoming brownish; spores elliptical, hyaline, smooth, 6–7 μ long; stem distinctly lateral, very short, scarcely 2 mm. long.

On rotten trunks, in woods. Dannevirke, New Zealand. Island of Tahiti.

123. *Panus stipticus*, Fries, Epicr., p. 399; Flora N.Z., ii., p. 176; Hdbk. N.Z. Flora, p. 605; Massee, Brit. Fung.-Flora, ii., p. 309; Austr. Fung., p. 97; Sacc., Syll. v., no. 2557.

Imbricated, fixed laterally, horizontal, thin, flexible, reniform, margin usually entire, cuticle broken up into minute scurfy scales, cinnamon, then yellowish-buff, 1·5–3 cm. across; gills rather crowded and narrow, connected by thin transverse ridges, margin entire; spores hyaline, $3 \times 2\,\mu$; stem distinctly lateral, compressed, very short. Taste hot and pungent.

On decaying trunks, stumps, &c. Northern Island, New Zealand. Australia, Europe, United States.

Recognised by the densely crowded imbricated habit, cinnamon-colour of every part, and the hot taste.

34. **Lentinus**, Fries.

Pileus coriaceous, tough, hard and dry when old; gills dry, tough, thin, margin thin, minutely toothed or eroded, more or less decurrent; stem central, excentric, or lateral; spores white.

Lentinus, Fries, Epicr., p. 45.

Allied to *Panus*, but readily distinguished from this and every other genus of dry coriaceous species by having the margin of the gills minutely toothed or notched. Always on wood, branches, &c.

124. *Lentinus novæ-zelandiæ*, Berk., Flora N.Z., ii., p. 176; Hdbk. N.Z. Flora, p. 605; Sacc., Syll. v., no. 2481.

Sessile, attached by a narrowed base, fan-shaped, reniform or suborbicular, thin and flexible, bay-brown, clothed behind with short velvety olive down, about 2·5 cm. long and broad; gills decurrent behind, narrow, edge thin and torn, coloured like the pileus.

On dead wood. New Zealand.

Closely resembling *Lentinus castoreus*, but smaller, and with narrower gills. There is no specimen in Berkeley's herbarium.

125. *Lentinus castoreus*, Fries, Epicr., p. 305; Austr. Fung., p. 95; Sacc., Syll. v., no. 2485.

Imbricated, sessile but narrowed behind into a more or less pronounced stem-like base, the component pilei narrowly fan-shaped or tongue-shaped, margin narrowly incurved, entire or wavy; sometimes the pelei are resupinate, margin free all round, and the gills radiating from the centre, at others curled to form a funnel-shaped pileus, flexible, even or wrinkled, rufous, then yellowish-tawny, 3–12 cm. long; gills crowded, rather narrow, margin irregular, brownish; spores hyaline, subglobose, 4 μ.

On logs, &c. Northern Island, New Zealand. Europe, Cuba, United States.

Very variable in form and size. The principal distinctive features are the elongated pilei, tan colour, and glabrous pileus. The figure of this species by Fries (Icones, pl. 175, f. 3) is 14 cm. broad and the gills 1 cm. broad; it is, however, usually smaller.

126. *Lentinus hepatotrichus*, Berk., Flor. Tasm., p. 249, pl. clxxxi., fig. 9 (1860); Cke., Austr. Fung., p. 95; Sacc., Syll. v., no. 2490.

Pileus sessile, attached laterally, hoof-shaped, horizontal, 1·5–2 cm. broad, somewhat shaggy or strigose at the point of attachment, becoming smooth towards the margin, liver-colour or sometimes yellowish; gills radiating from the point of attachment, broad, rather distant, pallid, margin minutely toothed; spores elliptical, smooth, pallid, 7 × 5 μ.

On wood and bark. New Zealand. Tasmania.

Distinguished by the dark colour of the pileus and the broad gills having the margin minutely crenulated.

127. *Lentinus lepideus*, Fries, Epicr., p. 390; Austr. Fung., p. 91; Sacc., Syll. v., no. 2351.

Pileus fleshy, tough, convex, then depressed and unequal, pale dingy-ochraceous, becoming broken up into darker spot-

like squamules, 4–8 cm. across; flesh 4–6 mm. thick at the disc, white; gills decurrent, slightly sinuate, 4–6 mm. broad, margin irregular, torn, transversely striate, whitish or tinged with yellow; spores narrowly elliptical, smooth, $7 \times 3\,\mu$; stem usually 2–3 cm. long but sometimes longer, about 1 cm. thick, tapering below into a rooting base, hard, pale, with downy squamules, the veil soon disappearing.

On logs, stumps, &c. Dannevirke, New Zealand. Australia, Europe, Siberia, United States.

Showy, large, firm, much deformed, often somewhat excentric; smell pleasant. Often white. Developing into very grotesque forms when growing in dark situations.

128. *Lentinus zealandicus*, Sacc., Syll. v., no. 2467. *Scleroma pygmæum*, Berk., Flora N.Z., ii., p. 176; Hdbk. N.Z. Flora, p. 605.

Pileus thin, rather tough, cream-colour or dingy-white, glabrous, slightly striate, deeply umbilicate or funnel-shaped, 1·5–2·5 cm. across; gills decurrent, rather distant and broad, edge quite entire, interstices even; spores pip-shaped, hyaline, $6 \times 4\,\mu$; stem 2·5–5 cm. long, very slender, with a tawny or rufescent tinge, base with pale down, rooting.

On rotten logs. Forest of Tehawera, Northern Island, New Zealand.

Solitary, or frequently 2–5 plants springing in a cæspitose manner. Rigid when dry. Not a typical *Lentinus*, on account of the entire edge of the gills.

35. **Lenzites**, Fries.

Pileus corky, coriaceous, growing horizontally, sessile and attached by a broad base behind; gills coriaceous, elastic, radiating from the point of attachment of the pileus, edge sharp, entire; spores white.

Lenzites, Fries, Epicr., p. 403.

Allied to *Trametes* and *Dædalea*, but differs in the gills remaining free from each other, and not anastomosing or connected by transverse bars to form elongated pores. *Lentinus* differs in the serrated margin of the gills. Growing on wood.

129. *Lenzites repanda*, Fries, Epicr., p. 404; Flora N.Z., ii., p. 177; Hdbk. N.Z. Flora, p. 606; Sacc., Syll. v., no. 2688; Austr. Fung., p. 103.

Pileus attached laterally, horizontal, thin, sessile but contracted at the point of attachment into a very short thickened stem-like base, irregularly reniform, margin often lobed or wavy, almost plane, glabrous, with raised concentric zones,

pallid or whitish, 6–15 cm. broad, entire texture corky; gills radiating from the point of attachment, forking, narrow, often anastomosing laterally to form sinuous pits of various lengths, closely crowded, coloured like the pileus; spores hyaline, elliptical, 5 × 3 μ.

On dead wood. Northern Island, New Zealand. Australia, Borneo, Ceylon, Himalayas, China, Andaman Islands, Mauritius, West Africa, West Indies, United States. Absent from Europe.

A beautiful and widely distributed species, closely resembling *Lenzites deplanata*, Fries, and *L. applanata*, Fries, differing from both in the pileus being glabrous and marked with raised concentric zones or ridges. The corky gills are narrow and very closely crowded, and anastomose to such an extent that the hymenium consists of more or less elongated pits, as in *Dædalea*, rather than of gills. The present genus connects the *Agaricineæ* with the *Polyporeæ*. The corky substance is that of the latter.

130. *Lenzites betulina*, Fries, Epicr., p. 405; Austr. Fung., p. 101; Sacc., Syll. v., no. 2630.

Pileus horizontal, sessile, attached behind by an expanded base, more or less reniform or semicircular, tomentose or minutely velvety, pallid, slightly zoned, tinged brownish, becoming pale, margin similar in colour, 5–12 cm. long, 2·5–6 cm. broad; flesh up to 8 mm. thick behind, becoming gradually thinner up to the acute straight margin, corky and elastic, white; gills rather thin, radiating from the point of attachment of the fungus, broad, forked and anastomosing, straight, dingy-white; spores elliptical, smooth, 4 × 2 μ.

On trunks, stumps, &c. Dannevirke, New Zealand. Australia, Europe, Siberia, United States.

When young the gills are thickish, somewhat joined together here and there, resembling pores; at a later stage of development they become thin, with a thin sharp edge. Imbricated as a rule. Entire fungus corky and tough, firm and rigid, usually indistinctly zoned.

EXPLANATION OF PLATES XXII.–XXIV.

Plate XXII.

[*These diagrams illustrate the principal types of structure used in describing Agarics.*]

Fig. 1. Section showing an *infundibuliform* or funnel-shaped pileus, *a*, and *decurrent* gills, *b*. The stem is hollow.

Fig. 2. Section showing an *umbilicate* pileus, *a*, and *adnate* gills, *b*. The margin or edge of the pileus is *involute* or incurved, *c*.

PLATE XXII.—*continued.*

Fig. 3. Section showing a fungus having the margin of the pileus straight and adpressed to the stem when young, *a*.

Fig. 4. A young plant enclosed in a *universal volva*, *a*, which is becoming ruptured and exposing the young fungus, *b*.

Fig. 5. Section of a young plant enclosed in a *universal volva*, *a*, which is yet entire.

Fig. 6. Fungus furnished with a *volva*, *a*; portions of the volva remaining as patches on the pileus, *b*; *annulus* or ring on the stem, *c*.

Fig. 7. A *resupinate* fungus with *excentric* gills.

Fig. 8. Section showing *umbonate* pileus, *a*, and *adnexed* gills, *b*.

Fig. 9. Section showing *gibbous* pileus, *a*, and *sinuate* gills, *b*.

Fig. 10. Section of a *dimidiate* pileus growing on wood, *a*.

Fig. 11. Section showing *free* gills, *a*.

Fig. 12. A fungus showing the *secondary veil*, *a*, breaking away from the margin of the pileus, and exposing the gills.

PLATE XXIII.

Fig. 1. *Amanita phalloides*, Fries; natural size.

Fig. 2. Section through portion of pileus and stem of same; natural size.

Fig. 3. Basidium and spores of same; × 400.

Fig. 4. *Lepiota clypeolaria*, Bull.; natural size.

Fig. 5. Section through portion of pileus and stem of same; natural size.

PLATE XXIV.

Fig. 1. *Pluteus cervinus*, Schæff.; natural size.

Fig. 2. Section of portion of pileus of same; natural size.

Fig. 3. Portion of hymenium, showing a single basidium bearing four spores, two paraphyses, and one cystidium; × 400.

Fig. 4. *Pholiota præcox*, Pers.; natural size.

Fig. 5. Section of portion of pileus and stem of same; natural size.

Fig. 6. Basidium with four spores, one large cystidium, and paraphyses of same; × 400.

Fig. 7. *Psathyrella disseminata*, Pers.; natural size.

Fig. 8. Section of same; natural size.

Fig. 9. Spores of same; × 400.

Fig. 10. *Omphalia colensoi*, Berk.; natural size.

Fig. 11. Section of same; natural size.

Fig. 12. Basidium and spores of same; × 400.

Fig. 13. *Xerotus glaucophyllus*, Cke. and Mass.; natural size.