

University of the State of New York

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MEMOIR  
OF THE  
New York State Museum

FREDERICK J. H. MERRILL *Director*

No. 4 Vol. 3

November 1900

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REPORT OF THE STATE BOTANIST

ON

EDIBLE FUNGI OF NEW YORK

1895-99

BY

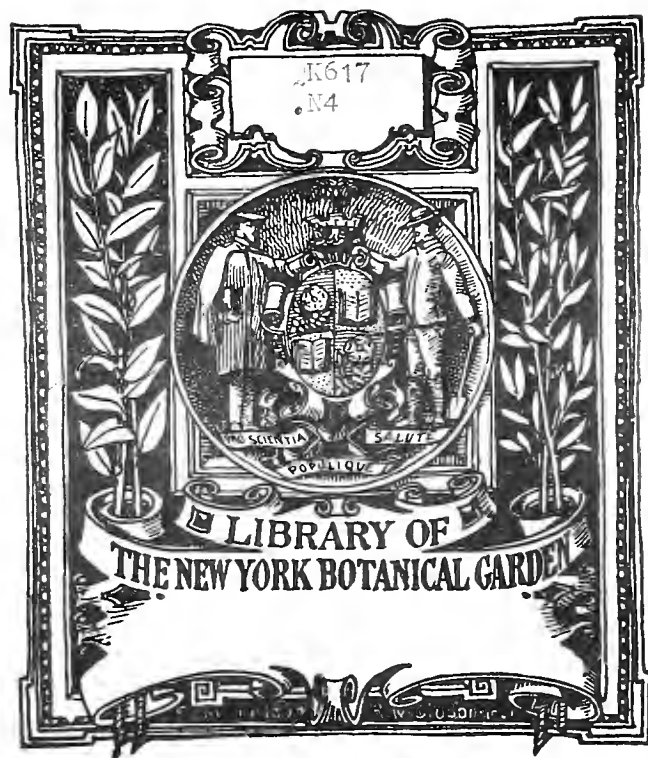
CHARLES H. PECK M.A.

*State botanist*

ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

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## INTRODUCTION

The number of species added to the list of edible mushrooms of the state the past season and herein described and illustrated is 14. In reports 49, 51 and 52, the last published as *Bulletin of the New York state museum, no. 25, vol. 5, 33* edible and one unwholesome species are described and illustrated. In consequence of recent discoveries of variations in a few of the edible species described and illustrated in the three reports mentioned, and of the great demand for these reports, it has seemed desirable to revise the illustrations and descriptions where needful and to incorporate the whole in the present memoir with that part of the state botanist's report for 1899 relating to edible fungi. Accordingly an attempt has been made to arrange both descriptions and illustrations as far as possible in harmony with their natural and generic relations to each other. In doing this it has been necessary in many cases to change the numbering of the plates and to reproduce and rearrange some of the illustrations on the plates. This memoir constitutes the second volume of descriptions and illustrations of New York species of edible and unwholesome mushrooms.



New York State Museum

EDIBLE FUNGI

Synoptic table of genera represented

	Mushroom having a cap . . . . .	1
	Mushroom without a cap . . . . .	14
1	Under surface of cap furnished with thin radiating plates or gills . . . . .	2
1	Under surface having pores or tubes . . . . .	13
1	Under surface having slender, pointed spines . . . . .	Hydnum
1	Under surface even or slightly wrinkled . . . . .	Craterellus
2	Gills with the edge obtuse . . . . .	Cantharellus
2	Gills with the edge acute . . . . .	3
3	Gills free from the stem . . . . .	4
3	Gills attached to the stem at their inner extremity . . . . .	6
4	Stem without a collar . . . . .	Amanitopsis
4	Stem with a collar . . . . .	5
5	Spores white . . . . .	Lepiota
5	Spores brown . . . . .	Agaricus
6	Plant with a white or colored juice . . . . .	Lactarius
6	Plant without a white or colored juice . . . . .	7
7	Gills of a soft, waxy texture . . . . .	Hygrophorus
7	Gills not waxy . . . . .	8
8	Stem fleshy or externally fibrous . . . . .	9
8	Stem cartilaginous or externally cartilaginous . . . . .	Collybia
9	Central substance of gills vesicular . . . . .	Russula
9	Central substance of gills not vesicular . . . . .	10
10	Spores white . . . . .	11
10	Spores ferruginous, rusty brown or rusty ochraceous . . . . .	12
10	Spores purplish brown . . . . .	Hypholoma
11	Gills sinuate, notched or excavated next the stem . . . . .	Tricholoma
11	Gills adnate or decurrent, not notched . . . . .	Clitocybe
12	Stem with a collar . . . . .	Pholiota

- |    |                                                               |             |
|----|---------------------------------------------------------------|-------------|
| 12 | Stem without a collar . . . . .                               | Cortinarius |
| 13 | Tubes not easily separable from the cap . . . . .             | Boletinus   |
| 13 | Tubes easily separable from the cap . . . . .                 | Boletus     |
| 14 | With short branches bearing slender, pendent spines . . . . . | Hydnum      |
| 14 | Without spines, spore surface even . . . . .                  | Clavaria    |

***Amanitopsis strangulata* (Fr.) Roze**

STRANGULATED AMANITOPSIS

PLATE 44, figs. 1-10

Pileus fleshy but rather thin, fragile, at first ovate, then broadly convex or subcampanulate, finally nearly plane, warty, slightly viscid when moist, deeply and distinctly striate on the margin, grayish brown or mouse color, sometimes paler on the margin; lamellae close, free, broader toward the outer extremity, white or whitish; stem equal or slightly tapering upward, stuffed or hollow, floccose squamulose, white or whitish, the adherent remains of the ruptured volva sometimes forming an imperfect or fragmentary annulus near the base; spores globose, .0004 to .0005 of an inch in diameter.

The strangulated amanitopsis resembles the livid variety of the sheathed amanitopsis in color and size, but it is easily distinguished by the warts of the pileus and by the fragmentary remains of the ruptured volva or wrapper at the base of the stem. The spores also are a little larger than in that species.

When the young plant first appears above the surface of the ground, the cap is oval or somewhat egg-shaped, but it soon becomes more expanded and finally nearly flat. In wet weather the margin sometimes curves upward, making the cap appear concave above or centrally depressed. The warts have a soft or somewhat woolly texture and are easily separable from the cap. In the European plant they are represented as sometimes entirely absent. In the American plant they are quite persistent on the center of the cap, though they sometimes disappear from the thin plicate striate margin. They are represented in the figure of the species given by Fries in his *Icones* as paler than the cap, but in our plant they are as dark as the cap or sometimes even darker. The cap is grayish brown or mouse color, sometimes becoming paler or drab on the margin.

The gills are white or whitish, free from the stem and broader as they approach the margin of the cap. The intervening short ones are truncated at the inner extremity.

The stem is neither bulbous nor distinctly annulate. It is white or whitish and more or less mealy or scurfy. It is rather slender and sometimes slightly tapering upward. Near the base it is often adorned with a few transverse fragments of the wrapper, which are often so arranged as to resemble an incomplete ring or collar. Occasionally two or even three of these imperfect collars are formed. Fries represents the base of the stem of the European plant as sheathed by a membranaceous wrapper, but such a character is not well shown in the American plant. Neither does it show the one or two swollen nodes near the base of the stem, as represented in the figure in *Icones*. I suspect these discrepancies are due to the failure of the artist to represent these characters accurately, for Berkeley's figure of *Agaricus ceciliae* B. and Br., which Fries, in *Hymenomyces Europaei*, places as a synonym of *Agaricus strangulatus*, well represents our plant. It is also well represented in one figure of *Agaricus strangulatus* as given by Saunders and Smith. They also represent the spores as globose, but at the same time they quote the presumably incorrect description of them, which says that they are oval, .0006 inch long, .00034 broad. Saccardo has also admitted this description of the spores in *Sylloge*. We must either suppose this description is incorrect or else we must suppose that all recent mycologic authors, including the illustrious Fries himself, have confused two distinct species. The former supposition seems to us to be the more reasonable. If, however, it should ever be shown that *Agaricus ceciliae* B. and Br. is not the same as *Agaricus strangulatus* Fr., then our American plant must bear the name *Amanitopsis ceciliae* (B. and Br.) instead of the name we have used.

The cap is 1.5 to 4 inches broad, the stem is 3 to 5 inches long and 3 to 6 lines thick.

The plants grow singly or in groups in or near the borders of woods. They appear in July. The species is rare with us. It was first found by me in 1869, near Greenport, Suffolk co. The second locality known to me is near Gansevoort, Saratoga co., where it was found growing in a field but near the borders of a piece of woods. Its edible character was tested, and

it was found to be agreeable to the taste and perfectly harmless, but not very highly flavored. It is much like the sheathed amanitopsis in this respect. European authors do not appear to have included it among edible species.

***Lepiota americana* Pk.**

AMERICAN LEPIOTA

PLATE 44, fig. 11-16

Pileus at first ovate, then convex or expanded, umbonate, squamose, white, the umbo and scales reddish or reddish brown; lamellae close, free, white; stem somewhat thickened at or a little above the base, hollow, annulate, white; spores subelliptic, uninucleate, .0003 to .0004 of an inch long, .0002 to .0003 broad.

The American lepiota belongs to the same genus as the parasol mushroom and the smooth lepiota. It has one character in which it differs from all our other species of this genus. The whole plant when fresh is white, except the umbo and the scales of the cap, but in drying it assumes a dull reddish or smoky red color. By this character it is easily recognized.

In the very young plant the cap is somewhat egg-shaped and nearly covered by the thin, reddish brown cuticle, but as the plant enlarges the cuticle separates and forms the scales that adorn the cap. On the central prominence or umbo, however, it usually remains entire. The margin of the cap is thin and is generally marked with short radiating lines, or striations. The gills do not quite reach the stem and are, therefore, free from it. Sometimes they are connected with each other at or near their inner extremity by transverse branches. They are a little broader near the margin of the cap than at their inner extremity. The stem affords a peculiar feature. It is often enlarged toward the base and then abruptly narrowed below the enlargement, as in the onion stemmed lepiota. In some instances, however, the enlargement is not contracted below and then the stem gradually tapers from the base upward. The stem is hollow and usually furnished with a collar, but sometimes this is thin and may disappear with advancing age. Wounds or bruises are apt to assume brownish red hues.

The caps vary in width from 1 to 4 inches; the stems are from 3 to 5 inches long, and 2 to 5 lines thick. Sometimes plants attain even larger dimensions than these. The plants grow singly or in tufts in grassy ground or on old stumps. They may be found from July to October.

In a European species, *Lepiota badhami* Berk., the plant turns red when bruised, but according to the description of that plant its cap is not white but brown or sooty brown, and its scales also are brown and small. The margin of the cap is not striate and the stem is more or less bulbous at the base.

***Tricholoma terreum fragrans* Pk.**

FRAGRANT TRICHOLOMA

PLATE 45, *f* 2, 0-15

Pileus convex or nearly plane, dry, innately fibrillose or minutely floccose squamulose, grayish brown or blackish brown; lamellae rather broad, adnexed, whitish or cinereous; stem equal, solid or stuffed, rarely hollow, whitish; spores broadly elliptic, .00024 to .00028 of an inch long, .00016 to .0002 broad.

The fragrant tricholoma has a distinct farinaceous odor and flavor. In other respects it closely resembles the earth-colored tricholoma, of which it is considered a mere variety. The typical European plant is said to be without odor or nearly so and has not been classed among the edible species by European writers. But, our variety, though not high flavored, is fairly good and entirely harmless. Its cap varies considerably in color but is some shade of gray or brown. Its center is without any prominence or very bluntly prominent, and its surface is commonly very obscurely marked with innate fibrils or in small plants, may have very small flocculent tufts or scales. The flesh is whitish, as also are the gills, though these sometimes assume a more decided grayish hue. They are rather broad and loose and sometimes uneven on the edge or even split transversely. They are usually deeply excavated next the stem and attached to it by a narrow part. The stem is whitish or slightly shaded with the color of the cap. It often has a few longitudinal fibrils, but never any collar. It may be either solid, stuffed or spongy within or, in large specimens, hollow.

The plants grow gregariously or sometimes in tufts on the ground under or near trees or in thin woods, specially of pine, or in mixed woods. The caps vary from 1 to 4 inches in breadth, and the stems from 1 to 3 inches in length, and from 2 to 6 lines in thickness. The plants occur in autumn. In Europe there is a variety of this species which also has a farinaceous odor, but it differs from our plant in having reddish edges to the gills. It is called variety *ori rubens*.

One correspondent, in writing concerning the method of preparing this mushroom for the table, says that, when steamed for 30 minutes, with the addition of butter, pepper and salt, it makes a very good dish.

***Tricholoma portentosum centrale* Pk.**

CENTRAL TRICHOLOMA

PLATE 45, *fig.* 1-5

Pileus convex, sometimes slightly umbonate, viscid, virgate with innate blackish fibrils, sooty brown in the center, pale yellow or greenish yellow elsewhere, flesh white; lamellae moderately broad and close, emarginate, white or yellowish; stem equal, solid, white; spores broadly elliptic, .0003 of an inch long, .0002 broad.

This variety of the dingy tricholoma, *T. portentosum*, is well marked by the colors of the cap, which is pale yellow or greenish yellow except in the center, where it is sooty brown or blackish brown. Minute brown or blackish lines or fibrils radiate from the center toward the margin. When fresh or moist the surface of the cap is viscid. The flesh is white and the taste mild.

The gills are white or yellowish, rather broad and rounded at the end next the stem, to which they are narrowly and slightly attached. Sometimes they are transversely striated or streaked by lighter lines. The stem is nearly equal in thickness in all its parts. It is solid and white or whitish both externally and internally. The cap is from 1 to 3 inches broad; the stem 1.5 to 3 inches long, 3 to 5 lines thick. The plants are gregarious and inhabit thin woods. They may be found in autumn. This is a fairly good edible mushroom, but not superior in any respect to many others that are more abundant. The typical form of the species, *Tricholoma porten-*

to sum, has the cap of a uniform sooty brown color. Saunders and Smith figure a variety which occurs in England and which has the cap greenish yellow with a sooty brown center almost exactly like our plant. The brown color of the central part of the cap is very conspicuous and is suggestive of the name we have given to this variety.

**Clitocybe clavipes** (Pers.) Fr.

CLUB STEMMED CLITOCYBE

PLATE 46, figs. 1-6

Pileus broadly convex or nearly plane, very thick and fleshy, almost obconic, soft, glabrous, brown or sooty brown; lamellae subdistant, decurrent, white or barely tinged with yellow, stem tapering upward, solid, colored like the pileus; spores .00025 to .0003 of an inch long, .00016 to .0002 broad.

The club stemmed clitocybe may easily be recognized by its peculiar shape and colors. The cap may be compared to a very broad and short inverted cone and the stem to a very narrow elongated cone, the apices of the two being united. Between the brown upper surface of the cap and the similarly colored stem the white gills intervene as if to separate them.

The upper surface of the cap is generally nearly flat and even, but sometimes it may be a little depressed in the center, and sometimes it is furnished with a small umbo. Its margin is at first involute, but spreading when mature. It varies in color from grayish brown to a dark sooty brown, with the center occasionally darker than the margin. The flesh is white and in mature plants is rather soft. The flesh of the stem is also white and somewhat soft and spongy, but elastic. The color may sometimes be a little paler than though similar to that of the cap. In shape it is commonly tapering from the base upward, but in some cases the base is more abruptly enlarged, making it almost bulbous. Its surface may be adorned with a few fibrils.

The pileus is 1 to 3 inches broad; the stem 1 to 2.5 inches long and 3 to 4 lines thick at the top, but much thicker at the base. The plants grow in a scattered manner or rarely tufted, and are specially fond of pine woods. They occur from August to October.

Fries says that this species is not edible on account of its spongy texture, but I find it pleasant-flavored and digestible and see no reason why it may not be utilized if taken when dry. After heavy rains it is apt to be water-soaked. It differs from the intermediate clitocybe, *Clitocybe media*, in its thicker obconic cap, its more decurrent gills and in its longer upwardly tapering stem.

***Clitocybe monadelpha* Morg.**

CLUSTERED CLITOCYBE

PLATE 46, figs. 7-12

Pileus fleshy, convex becoming nearly plane or somewhat depressed, at first glabrous or nearly so, then squamulose or virgate, variable in color, honey color, pale reddish brown or reddish, the margin even, flesh white or whitish; lamellae moderately close, distinctly decurrent, whitish or pale flesh color; stem long, solid, crooked, fibrous, tapering at the base, shining, pallid or brown; spores subelliptic, .0003 of an inch long, .0002 broad.

The clustered clitocybe is a rare species in our state and has been found by me in one locality only. It is apparently more plentiful farther west. It resembles the honey colored armillaria in size and general appearance, but it may be distinguished by the entire absence of a veil and a collar, by its decidedly decurrent gills and by its solid stem. The cap in the typical western form is at first smooth but it finally becomes scaly. In the eastern form it is smooth or nearly so when young, but it is soon adorned with minute tufted fibrils or fibrillose scales in the center and with darker lines or closely pressed fibrils toward the even margin. The color in our specimens is a pale reddish brown, a little darker than isabelline and approaching russet. The western form varies from honey color to reddish brown. The gills are whitish or pallid and they run down on the stem, gradually tapering to a point. The stems are densely clustered and united at the base, forming tufts of many individuals. They are more or less irregular, twisted, crooked and tapering toward the base. They have a fibrous texture externally and are smooth and somewhat shining. In our specimens they are brown and darker than the cap.

The cap is 1 to 2.5 inches broad; the stem is 3 to 4 inches long and 2 to 4 lines thick.



The plants grow under trees and appear in September. In Ohio the typical form is said to grow from spring till late autumn and to form clusters of 20 to 50 individuals.

A pale form is shown in figure 9.

***Clitocybe multiformis* Pk.**

MULTIFORM CLITOCYBE

PLATE 47, *f*, 1-9

Pileus thin, convex or nearly plane, often lobed or irregular on the margin, glabrous, hygrophaneous, whitish, yellowish or grayish when moist, paler when dry, flesh white when dry; lamellae thin, narrow, close, adnate or slightly decurrent, white; stem equal, solid, glabrous, white; spores elliptic, .0002 to .00024 of an inch long, .00016 broad.

The multiform clitocybe commonly grows in tufts of many plants, which are often so crowded that the caps are closely pressed against each other and in this way become very irregular. When they grow separately, the caps are much more regular. They vary in color as well as in shape. When young and fresh or after rain, they have a moist appearance, but after the moisture has disappeared they are paler. In some specimens the caps are whitish, in others, yellowish, and in another form they are grayish, and then they are often smoky brown in the center. In specimens wholly dried the color changes to a grayish brown, which is quite unlike the color of the fresh whitish or yellowish fungus.

The gills are narrow and closely placed side by side. They are attached to the stem by the entire width of the inner extremity, which is sometimes slightly prolonged downward on it. They are white or whitish.

The stem is about as thick as a pipe stem when well grown, but it is often crooked or compressed or irregular. It is whitish, smooth and solid.

The cap is 1 to 3 inches broad; the stem 1 to 2 inches long and 2 to 3 lines thick. This mushroom appears late in the season and grows in low, damp places in woods. Its mode of growth is similar to that of *Clitocybe multicaps* Pk., but it is a much smaller and thinner species, and the caps are more irregular when growing in tufts. Though not highly flavored, it is quite tender and good, and, growing as it does in large tufts, it is easy to obtain in satisfactory quantity for the table.

***Collybia platyphylla* Fr.**

## BROAD GILLED COLLYBIA

PLATE 49, figs. 1-8

Pileus thin, fragile, convex, innately fibrillose, grayish brown or blackish brown, flesh white; lamellae broad, subdistant, commonly deeply emarginate, adnexed, white; stem stout, equal, fibrillose striate, stuffed or hollow, white or pallid, sometimes with branching strands of white mycelium at the base; spores subglobose or broadly elliptic, .0003 to .0004 of an inch long, .00024 to .0003 broad.

The broad gilled collybia is a comparatively large species, with a stem much thicker and more fleshy than is usual in this genus. The cap is very broad but rather thin and fragile. It is at first somewhat conic or egg-shaped but it soon expands, till it is convex or nearly flat, and occasionally it becomes concave or saucer-shaped by the elevation of the margin. In such cases the margin is often split. The surface is minutely marked by closely pressed or innate fibrils. It varies in color from whitish to dark brown, but it is commonly grayish brown. The center is sometimes darker than the rest. The gills are broad and usually deeply excavated at the stem end. They are often transversely striate and sometimes split transversely in several places. They are white. The stem is stout and fleshy but with a fibrillose and slightly tough or cartilaginous exterior. It is sometimes stuffed, sometimes hollow. Its white color contrasts well with the grayish brown of the cap. Its thick, fleshy character often misleads the inexperienced mycologist to think the species belongs to the genus *Tricholoma*. White branching strands of mycelium are sometimes found at the base of the stem, and such forms, having a hollow stem, have been by some considered a distinct species and named *Collybia repens*, the creeping collybia, but they appear to me to be a mere form of the broad gilled collybia. Sometimes this species emits a faint but agreeable odor resembling that of anise, but in decay the odor is very disagreeable and the plants loathsome. Insects are fond of this mushroom, and it is not always easy to find specimens free from their attacks. Their eggs are often found attached to the surface of the cap, where they have been deposited by the parent insect.

The plants grow in thin woods or open places, about stumps and old prostrate trunks or on much decayed wood, and may be found in wet seasons from spring to fall. The caps are 3 to 5 inches broad; the stems 3 to 5 inches long and a half-inch or more thick. In very wet weather or after heavy rains the caps are apt to have a moist appearance, but they are not truly hygrophaneous. Distorted and irregular forms are sometimes found. If the plants are left to dry without pressure, the margin becomes strongly involute.

***Collybia radicata* (Reh.) Fr.**

ROOTED COLLYBIA

PLATE 48, fig. 1-14

Pileus thin, convex or nearly plane, glabrous, viscid when moist, grayish brown or smoky brown, flesh white; lamellae broad, subdistant, adnexed; stem long, slender, firm, generally slightly tapering upward, stuffed, whitish or colored like or a little paler than the pileus, ending below in a long root-like prolongation, which penetrates the earth deeply; spores elliptic, with a slight oblique apiculus at one end, .0006 to .0007 of an inch long, .0004 to .0005 broad.

The rooted collybia is a common species and one easily recognized if notice is taken of the lower part of the stem. This is like a long, slender tap-root, tapering downward and generally penetrating the earth to a depth about equal to the length of the stem above the surface.

The cap is broadly convex or nearly flat, and sometimes is slightly raised or umbonate in the center. In well developed specimens the central part is generally rugose or radiately wrinkled. In wet weather it is viscid or even glutinous, but in dry weather the viscosity is scarcely noticeable. Notwithstanding this tendency to viscosity, the cap is usually clean and attractive.

The gills are broad, thick, well separated from each other and excavated or notched at the end next the stem. The point of attachment is therefore much more narrow than the middle part of the gill. The gills are white or slightly tinged with yellow.

The stem is generally thickest at the surface of the ground and tapers slightly from this point in both directions. In the typical form it is smooth,

but a variety is common in which it is minutely scurfy. This is named variety *furfuracea*. There is also a small form, called variety *pusilla*, in which the cap is about 1 inch broad. All these have the root-like prolongation of the stem which is suggestive of the specific name. The color of the stem is either whitish or similar to the color of the cap but paler. In the scurfy-stemmed variety it is often darker colored than in the typical form. Specimens are sometimes found in which the stem is white and occasionally both cap and stem are white. The spores are white when fresh, but after long exposure they sometimes assume a yellowish color.

The cap is from 1 to 4 inches broad and the stem from 2 to 8 inches long above the surface of the ground, and from 2 to 3 or rarely 4 lines thick.

In one specimen in the state herbarium the subterranean or root-like prolongation of the stem is a little more than 10 inches long. The plants grow singly or sparsely scattered in woods or recent clearings and may be found from June to October. The caps are somewhat tough but agreeable in flavor, and the species is classed as an edible one without any hesitation.

***Collybia velutipes* (Curt.) Fr.**

VELVET STEMMED COLLYBIA

PLATE 47, figs. 10-15

Pileus rather thin, convex or nearly plane, obtuse, glabrous, viscid, reddish yellow or tawny; lamellae broad, subdistant, rounded behind, slightly adnexed, white or tinged with yellow; stem firm, externally cartilaginous, stuffed or hollow, brown or tawny brown, velvety hairy when mature; spores narrowly elliptic, .0003 to .00036 of an inch long, .00016 broad.

The velvet stemmed collybia is one of the few mushrooms that appear very late in the season. It may be found after nearly all others have yielded to the severity of the weather. It has even been called a winter mushroom, because it is possible to find it in prolonged, mild, thawing weather in winter. It sometimes develops in spring also. It is easily recognized by its viscid, tawny cap, its velvety stem and tufted mode of growth. Sometimes the cap is wholly yellowish or yellowish on the margin and darker on the central part. Because of the crowded mode of growth the caps are sometimes very irregular. The gills are rounded or deeply notched next the

stem, so that they are slightly attached to it. They are whitish or white tinged with yellow. In very young plants the stem is whitish, but it soon becomes tawny or tawny brown from the development of the dense coat of velvety hairs. It is generally hollow. The caps are generally about 1 inch broad in large tufts, but in smaller and looser clusters or in scattered or single growths they are often larger. The stems vary from 1 to 3 or 4 inches long and from 1 to 3 lines thick. The plants grow on dead trunks of trees either standing or prostrate or on old stumps or decaying wood.

Its edible qualities are not inferior to those of the preceding species. Its flesh is more tender and quite as agreeable in flavor. It is well to peel the caps before cooking in order to free them from adhering particles of dirt or other objectionable matter.

***Hygrophorus flavodiscus* Frost**

YELLOW DISKED HYGROPHORUS

PLATE 50, fig. 1-6

Pileus fleshy, convex or nearly plane, glabrous, very viscid or glutinous, white, pale yellow or reddish yellow in the center, flesh white; lamellae adnate or decurrent, subdistant, white, sometimes with a slight flesh-colored tint, the interspaces sometimes venose; stem subequal, solid, very viscid or glutinous, white at the top, white or yellowish elsewhere; spores elliptic, white, .00025 to .0003 of an inch long, .00016 to .0002 broad.

The yellow disked hygrophorus scarcely differs from the sooty hygrophorus in any respect except in color. It is sometimes found growing with it in pine woods. Both appear late in autumn. The cap is rather thick and fleshy in the center but thin at the margin. It is so very viscid or glutinous that when dry its surface is smooth and shining as if varnished. The color of the disk is yellowish or reddish yellow but the margin is white.

The interspaces between the gills are distinct and sometimes are marked by cross veins. The gills are white or nearly white and are attached to the stem or run down on it.

The stem is solid and externally glutinous except a short space at the top.

The cap is 1 to 3 inches broad; the stem 1 to 3 inches long and from 3 to 6 lines or more thick.

**Hygrophorus fuliginosus** *Frost*

## SOOTY HYGROPHORUS

PLATE 50, *fig. 7-12*

Pileus convex or nearly plane, glabrous, very viscid or glutinous, grayish brown or fuliginous, the disk often darker or almost black; lamellae subdistant, adnate or decurrent, white; stem solid, viscid or glutinous, white or whitish; spores elliptic, .0003 to .00035 of an inch long, .0002 broad.

The sooty hygrophorus resembles the club stemmed clitocybe in the color of its cap but in nearly every other respect it is different. When moist the cap is covered with an abundant gluten which when dry gives it a shining appearance as if varnished. The color varies from grayish brown to a very dark or sooty brown with the central part usually still darker or almost black, but never with an umbo. The flesh and the gills are white. The stem also is white or but slightly shaded toward the base with the color of the cap. It is variable in length and shape, being long or short, straight or crooked, everywhere equal in thickness or tapering toward the base. It is glutinous and unpleasant to handle.

The cap is 1 to 4 inches broad; the stem 2 to 4 inches long and 4 to 8 lines thick. The plants grow either singly or in tufts. In the latter case the caps are often irregular from mutual pressure.

The plants occur in October and November in pine woods or woods of pine and hemlock intermixed.

This mushroom is tender and of excellent flavor, but its cuticle with its sticky and often dirty covering should be peeled away before cooking.

**Hygrophorus laricinus** *Pk.*

## LARCH HYGROPHORUS

PLATE 51, *fig. 1-12*

Pileus fleshy, convex or nearly plane, viscid when moist, reddish, tawny red or grayish red, flesh white, slightly yellowish under the adnate cuticle; lamellae distant, adnate or slightly decurrent, whitish; stem equal, firm, hollow, white; spores elliptic, .00024 to .0003 of an inch long, .00016 to .0002 broad.

The larch hygrophorus grows under tamarack trees in a gregarious manner and sometimes in great abundance. The cap in the young plant is very broadly conic or convex, but it expands with age till it is nearly or quite flat. It sometimes has a small central prominence or umbo. Under a lens the surface has a slightly silky appearance. The color is some shade of red and may be rusty red, tawny red or grayish red. The extreme margin is sometimes white, and in some specimens a reddish brown incircling line or narrow band is seen near the margin. Occasionally the margin is yellow. The flesh is white, slightly tinged with yellow under the inseparable cuticle. It is tender and, though slightly disagreeable when raw, is agreeable and well flavored when cooked. The gills are white and not closely placed side by side. They are broadly attached to the stem or slightly decurrent on it. The stem is white, stuffed or hollow and rather short. It is 1 to 2 inches long and 2 to 3 lines thick. The cap rarely exceeds 1 inch in diameter. It has been found near Warrensburg only. It appears in October.

**Hygrophorus chlorophanus Fr.**

SULFURY HYGROPHORUS

PLATE 51, figs. 13-20

Pileus thin and fragile, convex becoming nearly plane, often irregular with the margin split or lobed, glabrous, viscid, striate on the margin, yellow, sometimes tinged with red in the center; lamellae rather broad, subdistant, thin, ventricose, emarginate, adnexed, pale yellow; stem equal or nearly so, glabrous, viscid when moist, shining when dry, hollow, yellow; spores elliptic, .0003 of an inch long, .0002 broad.

The sulfury hygrophorus has a thin cap, which is easily broken unless handled with care. It is very viscid when moist and adorned with marginal striations. Its color is a beautiful pale yellow, but sometimes there are reddish tints in the center. The gills are rather broad and moderately wide apart. They are notched at the end next the stem, to which they are slightly attached. In our plant they are pale yellow, but a form of the European plant is said to have white gills.

The stem is rather long, slender, fragile and viscid when moist. On account of its viscosity, it is not easily plucked from its place of growth

without crushing. It is yellow and smooth. The plants grow in damp or mossy places in woods and may be found from July to September. The cap is 10 to 20 lines broad; the stem 1.5 to 3 inches long and about 2 lines thick. The waxy hygrophorus, *H. c e r a c e u s*, resembles this species but may be separated from it by the character of its gills, which are not notched at the stem end.

**Hygrophorus speciosus** *Pk.*

SHOWY HYGROPHORUS

PLATE 51, *fig. 21-28*

Pileus broadly convex, often with a small central umbo, glabrous, very viscid or glutinous when moist, yellow, usually bright red or scarlet in the center, flesh white, yellow under the thin, separable pellicle; lamellae distant, decurrent, white or slightly tinged with yellow; stem rather long, nearly equal, solid, viscid, slightly fibrillose, whitish or yellowish; spores elliptic, .0003 of an inch long, .0002 broad.

The showy hygrophorus is a beautiful mushroom. It grows under or near tamarack trees and may be found in September and October. The cap is smooth, quite regular and very viscid when moist. It often has a slight central and rather acute umbo or prominence. Sometimes this alone is red, sometimes all except the margin, but the red color is apt to disappear entirely with age, and even the bright yellow sometimes fades in old specimens. The flesh is white except under the thin, separable pellicle, where it is yellow. The gills, as is usual in this genus, are wide apart. They are decurrent on the stem and white or yellowish. The stem is rather long, specially when the plants grow among mosses, solid and nearly equal in diameter in all its parts. It is whitish or pale yellow.

The cap is 1 to 2 inches broad; the stem 2 to 4 inches long and 2 to 4 lines thick.

This species closely resembles the European *Hygrophorus aureus*, from which it differs in its place of growth, its solid stem, the absence of any trace of an annulus and of any tawny hues. *H. bresadolae* is another closely allied species, but it also is said to have a stuffed or somewhat hollow stem and a distinct annulus or collar.



**Hygrophorus puniceus** *Fr.*

## RED HYGROPHORUS

PLATE 52, *figs. 1-7*

Pileus thin, fragile, conical or campanulate, becoming expanded and often wavy or lobed, glabrous, viscid, bright red, paler when old; lamellae broad, thick, distant, yellow, often reddish; stem equal or somewhat ventricose, hollow, yellow or red and yellow, usually white at the base; spores elliptic, .0003 to .0004 of an inch long, .0002 broad.

The red hygrophorus is a rather large but very tender, fragile species. Its bright red cap makes it a beautiful and conspicuous object. It is, however, often irregular and lobed or split on the margin. Its color is apt to fade to yellow when old. The whole plant is so fragile that it must be handled with care to prevent its breaking in pieces.

The gills are rather broad and moderately distant from each other. Their color is yellow or red and yellow and their attachment to the stem slight. The stem is rather thick and sometimes narrowed toward each end. It is hollow, at least when mature, and is usually yellow at the top, red in the middle and white at the base. The cap is 1 to 3 inches broad; stem 2 to 3 inches long, 4 to 6 lines thick.

It grows in damp or mossy places both in woods and open grounds and appears from July to September. It surpasses our other bright red species in size. It may be separated from the carmine hygrophorus, *H. coccineus*, by its larger size, the narrow attachment of the gills to the stem and the white color of the base of the stem. From the vermilion hygrophorus, *H. minutus*, it is distinguished by its glabrous, viscid cap. All of these species are edible, and no harm would come to the eater if one should be mistaken for either of the others. The red hygrophorus is very tender and sapid and may be classed as an excellent though not an abundant mushroom.

**Hygrophorus virgineus** (*Wulf.*) *Fr.*

## WHITE HYGROPHORUS

PLATE 52, *figs. 8-12*

Pileus fleshy, convex, often becoming plane or centrally depressed, sometimes irregular or wavy on the thin margin, moist, white, flesh white, taste mild; lamellae thick, distant, decurrent, white; stem firm, smooth, solid, equal or tapering downward, white; spores elliptic, .00025 to .0003 of an inch long, .0002 broad.

This species is white in all its parts and when regular and well formed is a pretty mushroom. But the large specimens are apt to be irregular. The cap is thick and fleshy except at the margin, and, though it may be moist, it is not viscid. In the European plant its surface sometimes cracks into small areas and becomes floccose when dry, but I have not seen these features in the American plant. The spores in our plant are generally a little smaller than those of the European plant.

The stem is sometimes thickened upward and enlarges as it enters the cap. The cap is 1 to 3 inches broad; the stem 1 to 2 inches long, 3 to 5 lines thick. It is found in grassy ground and pastures in wet weather from July to October. It sometimes occurs in meadows, where it is overshadowed by tall grass. I know of no other wholly white indigenous hygrophorus that grows in such places. Its flesh is less tender than that of the preceding species, but it is a good mushroom and one that would be more useful if more abundant, and more eagerly sought if better known.

**Lactarius chelidonium** *Pk.*

## CELANDINE LACTARIUS

PLATE 53, *figs. 1-6*

Pileus convex, becoming nearly plane and umbilicate or centrally depressed, grayish yellow or pale tawny, sometimes with a few narrow zones on the margin, assuming bluish green tints or stains when old; lamellae narrow, close, adnate or slightly decurrent, grayish yellow, milk saffron color, scanty, mild; stem short, nearly equal, hollow, colored like the pileus; spores yellowish, globose, .0003 of an inch in diameter.

The celandine lactarius is closely related to the delicious lactarius, from which it may be separated by its smaller size, shorter stem, paler color, narrow gills and saffron colored milk. The cap is either broadly convex, nearly plane or depressed in the center. Sometimes the central depression is small like an umbilicus. The color is grayish yellow or pale tawny, and in some instances there are two or three narrow bands or zones near the margin. When old, its cap becomes bluish green or is marked by bluish green stains.

The narrow gills are close together and are attached to the stem by their entire breadth or are slightly decurrent. They are at first of a peculiar grayish yellow or dingy cream color, but when old they are generally whitish pruinose. In some specimens they are wavy or forked at the inner extremity. The milk is scanty and paler than in the delicious lactarius. It is nearly a saffron color and is mild.

The stem is short and cylindric or nearly so, glabrous, hollow and colored like the cap. It is sometimes spotted or stained with bluish green when old, but I have not seen it with such permanent depressed colored spots as often adorn the stems of the allied species, *L. deliciosus*, *L. subpurpureus* and *L. indigo*. The cap is 2 to 3 inches broad; the stem 1 to 1.5 inches long, 4 to 6 lines thick. It grows in light, sandy soil under or near pine trees and occurs from July to September. Its edible qualities are similar to those of the delicious lactarius.

### *Lactarius distans* *Pk.*

#### DISTANT GILLED LACTARIUS

PLATE 53, *figs.* 7-11

Pileus firm, broadly convex or nearly plane, umbilicate or slightly depressed in the center, with a minute velvety pruinosity, yellowish tawny or brownish orange; lamellae rather broad, distant, adnate or slightly decurrent, white or creamy yellow, the interspaces venose, milk white, mild; stem short, equal or tapering downward, solid, pruinose, colored like the pileus; spores subglobose, .00035 to .00045 of an inch broad.

The distant gilled lactarius is similar to the orange lactarius in color, but in other respects it is quite distinct. The short stem, widely separated gills

and pruinose surface of the cap are distinctive features. The cap is broadly convex and often has a small central depression or umbilicus. In some cases it becomes nearly plane or even slightly funnel-shaped by the spreading or elevation of the margin. The surface, specially in young and in well developed specimens, has a soft pruinose or almost velvety appearance to the naked eye, and, when viewed through a magnifying glass, it is seen to be covered with minute, persistent granules. The surface is sometimes wrinkled and frequently it cracks in such a way as to form small angular or irregular areas. The color is a peculiar one, varying somewhat in shade, but with tawny hues prevailing. It has been described as yellowish tawny and brownish orange. The flesh is white or whitish and has a mild taste.

The gills are wide apart, somewhat arched in specimens having a convex cap and slightly decurrent in those with fully expanded or centrally depressed caps. Their color is white or creamy yellow and in old and dried specimens they have a white pruinosity as if frosted by the spores. The milk is white and mild.

The stem is short, rarely more than an inch long, and is cylindric or tapering downward. It is solid and colored and clothed like the cap.

The cap is 1 to 4 inches broad; the stem is usually about 1 inch long, 4 to 8 lines thick. It is found in thin woods, bushy places and pastures from July to September. It is similar to the orange lactarius, *L. volemus*, in its edible qualities. It has several features in common with *Lactarius hygrophoroides* B. and C. and *L. calceolus* Berk. My reasons for considering it distinct are given in the report for 1898.

***Lactarius gerardii*Pk.**

GERARD'S LACTARIUS

PLATE 53, *fig. 12-16*

Pileus broadly convex or nearly plane, sometimes slightly depressed and rugosely wrinkled, sooty brown, flesh white, taste mild; lamellae rather broad, distant, adnate or slightly decurrent, white or whitish with venose interspaces, milk white, mild; stem short, equal or tapering downward, stuffed or hollow, colored like the pileus; spores globose, .00035 to .00045 of an inch broad.

This lactarius closely resembles the preceding in size and shape, but it differs decidedly in the color of its cap and stem, and in having the latter hollow. It resembles the sooty lactarius, *L. lignyotus* Fr., in color, but differs from it in having the stem short, the gills wide apart and wounds not changing color. In some specimens the center of the cap is furnished with a small umbo or papilla and the surface is wrinkled. It also has an unpolished appearance caused by a pruinosity similar to that of the preceding species, but of a sooty brown color. The margin is thin and often wavy or somewhat lobed. The gills are so nearly like those of the preceding species that they need no farther description. The plants grow in woods and open places from July to September. In flavor and edibility the species is very similar to the distant gilled lactarius. In nearly all the species of this genus that I have tried, the flesh is firm but brittle and the flavor not of a high order.

***Russula roseipes* ( Secr.) Bres.**

ROSY STEMMED RUSSULA

PLATE 54, Figs. 1-7

Pileus convex, becoming nearly plane or slightly depressed, at first viscid, soon dry, becoming slightly striate on the thin margin, rosy red, variously modified by pink, orange or ochraceous hues, sometimes becoming paler with age, taste mild; lamellae moderately close, nearly entire, rounded behind and slightly adnexed, ventricose, whitish becoming yellow; stem slightly tapering upward, stuffed or somewhat cavernous, white tinged with red; spores ochraceous yellow, globose or subglobose, .0003 to .0004 of an inch broad.

The rosy stemmed russula is a good example of the close relation that exists between some species of this genus, and of the difficulty of assigning satisfactory limits to species. This russula was first described by Secretan, who considered it a variety of *Russula alutacea* and named it *Russula alutacea roseipes*. It was afterward raised to specific rank by Bresadola and was accepted as a good species by Saccardo in *Sylloge*. Still later it was reduced again to varietal rank by Masee, who considered it a variety of *Russula puellaris*, and named it *Russula puellaris roseipes*. Though having points of resemblance to both *R. alutacea*

and *R. puellaris*, it seems better to us to retain it as a distinct species. It is not common in our state, having been collected in Albany and Saratoga counties only. Its distinguishing characters are its mild taste, its rosy cap, which is commonly dry but slightly striate on the margin, its gills changing from whitish to yellow or subochraceous and being slightly attached to the stem, and its stem which is slightly stained with rosy red.

From *R. lutacea* it may be separated by its smaller size, more narrow and slightly attached gills and by its less highly colored gills and spores. From *R. puellaris*, which it resembles in size, it may be distinguished by not having the center of the cap more highly colored than the rest and by the rosy tint of the stem. In the European plant the stem is said to be sprinkled with a rosy mealiness or pruinosity, but in our plant the color appears to be in the stem itself.

The cap is 1 to 2 inches broad; the stem is 1.5 to 2 inches long and 3 to 4 lines thick. The plants grow in woods of pine and hemlock and have been collected in July and August. The flesh is tender and agreeable in flavor.

***Russula ochrophylla* Pk.**

OCHERY GILLED RUSSULA

PLATE 54, fig. 8-14

Pileus firm, convex, becoming nearly plane or slightly depressed in the center, even or rarely very slightly striate on the margin when old, purple or dark purplish red, flesh white, purplish under the adnate cuticle, taste mild; lamellae entire, a few of them forked at the base, subdistant, adnate, at first yellowish, becoming bright, ochraceous buff when mature, dusted by the spores, the interspaces somewhat venose; stem equal or nearly so, solid or spongy within, reddish or rosy tinted, paler than the pileus; spores bright, ochraceous buff, globose, verruculose, .0004 of an inch broad.

The ochery gilled russula is a large, fine species but not a common one. It differs but little in color and size from the European pungent russula, *Russula drimeia*, but it is easily distinguished from it by its mild taste.

The cap is dry, 2 to 4 inches broad, convex or a little depressed in the center, purple or purplish red, the white flesh purplish under the cuticle, which, however, is not easily separable.

The gills are nearly all entire, extending from the stem to the margin of the cap. They are therefore much closer together near the stem than at the margin. They are at first yellowish, but a bright, ochraceous buff when mature. They are then dusted by the similarly colored spores.

The stem is stout, nearly cylindric, firm but spongy in the center and colored like the cap but generally a little paler. There is a variety in which the stem is white and the cap deep red. In other respects it is like the typical form. Its name is *Russula ochrophylla albipes*.

This mushroom has an agreeable flavor but the flesh is rather firm. Unless peeled before cooking it imparts a purplish hue to the milk or other liquid in which it is stewed. Its edible qualities appear to me to be similar to those of the greenish russula, *Russula virescens*. Both are fairly good but neither seems to be highly flavored. No mild flavored russula is known to be deleterious; and two or three of my correspondents assert that even the very acrid *Russula emetica* loses its acidity in cooking and has been eaten by them without any harm. But there are so many mild species that there is no need of running any risks by eating the acrid ones. The ochery gilled russula grows in groups under trees, specially oak trees, and should be sought in July and August.

### *Cantharellus cinnabarinus* Schae.

#### CINNABAR CHANTARELLI

PLATE 55, figs. 1-8

Pileus firm, convex or slightly depressed in the center, often irregular with a wavy or lobed margin, glabrous, cinnabar red, flesh white; lamellae narrow, distant, branched, decurrent, red; stem equal or tapering downward, glabrous, solid or stuffed, red; spores elliptic, .0003 to .0004 of an inch long, .00016 to .0002 broad.

The cinnabar chantarelle is readily recognized by its color. It is externally red in all its parts, the interior only being white. It is a small species but often quite irregular in shape. Small specimens are more likely to be regular than large ones. Sometimes the cap is more fully developed on one side than on the other. This makes the stem eccentric or in some cases almost lateral. The color is quite constant, but in some

instances it is paler and approaches a pinkish hue. It is apt to fade or even disappear in dried specimens. The gills are blunt on the edge as in other species of this genus. They are forked or branched, narrow and decurrent.

The stem is small, smooth and usually rather short. It is generally solid, but in the original description it is characterized as stuffed. The cap is 8 to 18 lines broad; the stem 6 to 12 lines long and 1 to 3 broad. It grows gregariously in thin woods and open places and may be found from July to September. It sometimes occurs in great abundance, which adds to its importance as an edible species. The fresh plant has a tardily and slightly acid flavor, but this disappears in cooking. In *Epicrasis*, Fries referred this species to the genus *Hygrophorus*, and in *Sylloge* also it is placed in that genus, but it is a true *Cantharellus* and belongs in the genus in which Schweinitz placed it.

***Cantharellus floccosus* Schw.**

FLOCCOSE CHANTARELLE

PLATE 55, figs. 9-13

Pileus firm, rather thin, elongated funnel-form or trumpet-shaped, deeply excavated, floccose squamulose, yellowish or subochraceous; lamellae thick, narrow, close, repeatedly forked, branched or anastomosing, very decurrent, ochraceous yellow; stem short; spores ochraceous, elliptic, .0005 to .0006 of an inch long, .0003 broad, with an oblique apiculus at one end and usually uninucleate.

The floccose chantarelle is a large and very distinct species. There is nothing with which it can easily be confused. When young it is narrowly club-shape or almost cylindric, but by the expansion of the upper part it soon becomes trumpet-shaped. The cavity extends even into the stem. The surface of the cap is somewhat floccose or scaly, but the scales may be thick and persistent or thin and evanescent. The color is yellowish inclining to ochraceous, but the inner flesh is white. The flesh is so thin that the weight of the whole plant is less than might be expected, judging from the size.

The gills are narrow, thick and blunt on the edge. They are so much branched and connected by cross veins that much of the hymenial surface has a coarsely reticulated appearance. Both the gills and the interspaces



are ochraceous or yellow ochraceous. The stem is very short and may be either glabrous or hairy. In some cases it is elongated and somewhat curved or flexuous and extended like a horizontal root among fallen leaves. The cap is 2 to 4 inches broad at the top, and 3 to 6 inches long. The plants are gregarious and grow in woods from July to September. My trial of its edible qualities was very satisfactory, and I consider it a very good mushroom for the table.

***Cantharellus lutescens* Fr.**

YELLOWISH CHANTARELLE

PLATE 56, *h*, 1-8

Pileus thin, convex, becoming nearly plane and umbilicate, nearly regular, pale orange or yellow when moist, paler and slightly virgate when dry; lamellae narrow, distant, forked or branched, decurrent, pale orange or yellow; stem equal or slightly tapering upward, glabrous, hollow, pale orange or yellow; spores broadly elliptic, .0004 of an inch long, .0003 broad.

The yellowish chantarelle occurs in woods and shaded places, growing among mosses, about old stumps or in soil well filled with decomposed vegetable matter. It may be sought in July and August. It has been regarded by some writers as a variety of the trumpet chantarelle, *Cantharellus tubaeformis* Fr., from which it may be distinguished by its more regular convex and umbilicate cap and by its more regular stem, which is equal or slightly tapering upward, not compressed, irregular and tapering downward as in that species. It is intermediate in character between that species and the funnel form chantarelle. It is somewhat variable in the color of the cap and seems to be commonly paler than the European form, which is described as having its cap brownish yellow. In the young plant the cap is not always umbilicate but it becomes so with age, and sometimes the umbilicus opens into and becomes continuous with the cavity of the stem. A wholly yellow form sometimes occurs, and generally the color of the cap, gills and stem is nearly alike in this species, so far as we have observed it. The gills are very narrow and forked or slightly branched. They do not become pruinose or dusted so conspicuously by the spores in maturity or in drying as do the gills of the funnel form chantarelle, and sometimes they remain

entirely naked. As in all the species of this genus, they are blunt on the edge.

The cap is about 1 inch broad: the stem 1 to 2 inches long and about 2 lines thick. The plants sometimes grow in tufts or clusters. They are not often found in abundance, and this, with their rather small size, detracts from their importance as an edible species.

*Cantharellus infundibuliformis* (Scop.) Fr.

FUNNEL FORM CHANTARELLE

PLATE 56, figs. 9-16

Pileus thin, broadly convex when young, becoming umbilicate or funnel-form with age, often pervious, frequently lobed, wavy or irregular on the margin, hygrophanous, sooty brown, brownish yellow or dingy yellow when moist, grayish, grayish yellow or grayish brown and slightly floccose or fibrillose when dry; lamellae narrow, distant, decurrent, irregularly or dichotomously branched, yellowish or subcinereous, becoming pruinose with age or in drying; stem slender, glabrous, hollow, yellow or yellowish; spores broadly elliptic or subglobose, .00035 to .00045 of an inch long, .0003 to .00035 broad.

The funnel form chantarelle grows gregariously, or sometimes in tufts, in damp woods or mossy, shaded swamps. It may be found from June to October. It is quite common and variable in color. Its cap is more highly colored when moist and becomes paler with the loss of moisture. When dry, the surface is slightly uneven and obscurely marked with brown fibrils, which are sometimes collected in small tufts or scales. The cap is broadly convex even in the young plant, but with advancing age it becomes fully expanded or assumes a funnel shape by the elevation of the margin. This is so excessively developed in some specimens that it becomes very wavy, much folded or lobed and presents a very irregular appearance. The gills are narrow, variously forked or branched, rather wide apart and sometimes connected by transverse veins in the spaces between them. They are generally yellowish or grayish yellow and are sometimes tinged with lilac. They appear in maturity as if frosted or covered with a minute, whitish dust or meakiness. This is one of the characters distinguishing this species from the yellowish chantarelle, and is probably due to the develop-

ment and partial retention of an abundant crop of spores. The stem is smooth, hollow, rather slender and variable in color, but nearly always some shade of yellow.

The cap is 1 to 2 inches broad; the stem 1 to 4 inches long, 1.5 to 2.5 lines thick.

For edible purposes the separation of the funnel-form chantarelle and the yellowish chantarelle is not of much importance. In tenderness and flavor they are very similar.

The yellowish craterellus, *Craterellus lutescens* (Pers.) Fr., is similar to these in color, size and shape, but may be distinguished from them by the absence of gills.

***Pholiota praecox* (Pers.) Fr.**

EARLY PHOLIOTA

PLATE 57, Figs. 1-11

Pileus convex or nearly plane, soft, nearly or quite glabrous, whitish, more or less tinged with yellow or tan color; lamellae close, adnexed, at first whitish, then brownish or rusty brownish; stem rather slender, mealy or glabrous, stuffed or hollow, whitish; spores elliptic, rusty brown, .0004 to .0005 of an inch long, .00024 to .0003 broad.

The early pholiota is a small but variable species. From other similarly colored species that appear in grassy ground early in the season, the collar on the stem will generally distinguish it. Its cap is usually convex when young but nearly flat in the mature plant. It is rather pale in color but not a clear white, being tinted with yellow or pale tan colored hues. The gills are whitish when the cap first opens, but they soon change to a rusty brown hue in consequence of the ripening of the spores. They are excavated at the inner extremity and slightly attached to the stem. They are ventricose when the cap is fully expanded. The stem is rather slender, nearly or quite straight and soon smooth and hollow. It is pale or whitish, and usually furnished with a small collar. Sometimes the collar is slight and disappears with age, and sometimes the fragments of the veil remain attached to the margin of the cap, leaving nothing for a collar.

The cap is 1 to 2 inches broad; the stem 1.5 to 3 inches long, 2 to 2.5 lines thick.

The plants usually grow in grassy ground, lawns and gardens and appear from May to July.

Variety *minor* Batt. is a small form having the cap only about 1 inch broad and the remnants of the veil adherent to the margin of the cap. It is represented by figures 6 to 8.

Variety *sylvestris* Pk. has the center of the cap brownish or rusty brown, and grows in thin woods. It is represented by figures 9 and 10.

*Pholiota temnophylla* and *P. vermiflua* are closely related species. The former is distinguished by its dingy yellow or ochraceous cap and its very broad gills, which are obliquely truncate at the inner extremity; the latter by its larger size, white and often areolate cap and later appearance.

***Pholiota adiposa* Fr.**

FAT PHOLIOTA

PLATE 57, figs. 12-17

Pileus fleshy, firm, at first hemispheric or subconical, then convex, very viscid or glutinous when moist, squamose, yellow, flesh whitish; lamellae close, adnate, yellowish, becoming ferruginous with age; stem equal or slightly thickened at the base, squamose below the slight, radiating, floccose annulus, solid or stuffed, yellow, generally ferruginous at the base; spores elliptic, .0003 of an inch long, .0002 broad.

The fat pholiota is a showy species. Its tufted mode of growth, rather large size, yellow color and rusty brown scales make it a noticeable object. The stem is somewhat and the cap very viscid when moist, and this viscosity when dry gives it a shining appearance. The scales of the cap become erect or reflexed and sometimes appear blackish at the tips. They sometimes disappear with age. The flesh is firm and white or whitish. The gills when young are yellow or pale yellow, but when mature they assume a ferruginous or rusty color, like that of the spores. The stem is similar in color to the cap but paler or nearly white at the top and usually reddish brown or rusty brown at the base. The collar is slight and often scarcely noticeable in mature specimens.

The cap is 2 to 4 inches broad; the stem 2 to 4 inches long and 4 to 6 lines thick. The plants commonly grow in tufts on stumps or dead trunks

of deciduous trees in or near woods. They may be found from September to November. It is well to peel the caps before cooking. This species is not classed as edible by European authors, but I find its flavor agreeable and its substance digestible and harmless. The most closely related species is the lemon yellow pholiota, *Pholiota limonella*. It is a smaller plant with a thinner, more expanded cap and with the gills of the young plant whitish instead of yellow. The color of the cap and stem is also a paler yellow. Its habitat and mode of growth are the same as those of the fat pholiota, but the plant is rare.

***Cortinarius corrugatus* ?.**

CORRUGATED CORTINARIUS

PLATE 55, *figs. 8-15*

Pileus fleshy, broadly campanulate or very convex, viscid when moist, coarsely corrugated, bright yellow, reddish yellow, tawny or ochraceous, flesh white; lamellae close, pallid when young, becoming tawny with age; stem rather long, equal, hollow, bulbous, pallid or yellowish, the bulb viscid and usually colored like the pileus; spores broadly elliptic, rough, .00045 to .00055 of an inch long, .0003 to .0004 broad.

The corrugated cortinarius is a well marked and easily recognized species, quite distinct from its allies. Though the color of the pileus is variable, its viscid, corrugated surface and the viscid bulb of the stem afford distinctive and easily recognized characters. Sometimes the corrugations or wrinkles anastomose with each other in such a way as to give a reticulated appearance. The color varies from yellow to reddish tawny or reddish ochraceous. The margin in young plants is incurved.

There is a variety in which the cap is adorned with darker colored spots or scales. This bears the name, variety *subsquamosus*. In all other respects it is like the typical form of the species.

The gills are closely placed side by side. They are at first of a pale hue but assume a darker and more definite tawny color with age. They are usually minutely uneven or eroded on the edge and transversely striate on the sides. They are slightly narrowed toward the stem.

The stem is generally a little longer than the width of the cap. It is commonly smooth, but sometimes sprinkled near the top with minute, yel-

lowish particles and adorned below with a few fibrils. It is hollow and has a distinct viscid, bulbous base, the viscosity of which is a peculiar feature. This bulb in the very young plant is even broader than the young cap, that at this stage of development appears to rest on it. The color of the bulb is usually like that of the cap, but the stem is commonly paler than either.

The cap is 2 to 4 inches broad; the stem 3 to 5 inches long, 3 to 8 lines thick. The plants are gregarious in woods and bushy places and may be found from June to September. They sometimes grow in considerable abundance, and as an edible species are not to be despised.

***Cortinarius evernius* Fr.**

WELL GROWN CORTINARIUS

PLATE 58, *fig. 1-7*

Pileus thin, fragile when old, ovate or subconical, becoming expanded or broadly convex, umbonate, hygrophanous, purplish brown or bay brown when moist, much paler and somewhat shining when dry, the margin in the young plant often whitened by the silky fibrils of the veil; lamellae broad, distant, adnexed, somewhat violaceous when young, becoming reddish brown and finally cinnamon; stem long, more or less crooked or flexuous, equal or narrowed downward toward the base, stuffed or hollow, silky fibrillose, violaceous, varied by the white fibrils of the veil; spores elliptic, .0004 to .0005 of an inch long, .0002 to .00024 broad.

The well grown cortinarius is an inhabitant of swamps and damp places in woods, often growing among mosses. It occurs in August and September. It is not specially attractive in appearance, nor in flavor when raw, but when cooked it makes a very agreeable dish. The cap of the young plant resembles an egg in shape, but it soon expands, becoming broadly convex or umbrella-shaped, and then generally has a prominent umbo in the center. White, silky fibrils often adorn it when young, specially on the margin. The stem also is more or less whitened or varied by them, though its own color is primarily violaceous. The color of the cap is dark chestnut or bay brown when young or moist, but the moisture soon disappears in dry weather and then the cap is much paler, inclining to grayish. The gills of the young plant are somewhat violaceous, soon changing to bay brown or

purplish brown and finally to a cinnamon hue, which is due to the color of the spores by which they are dusted. The stem is rather long and often somewhat curved or flexuous. It is hollow in the mature plant. When growing among mosses, it is often attenuated toward the base. The species is rare with us. I have found it in an extensive swamp only in Rensselaer county.

**Agaricus abruptus** /%.

ABRUPT MUSHROOM

PLATE 50, *figs.* 5-17

Pileus ovate when young, becoming convex or nearly plane, rather thin and fragile, smooth or slightly silky, shining, white, usually becoming tinged with yellow in drying, flesh white; lamellae narrow, close, thin, free, white or whitish when very young, soon pinkish, finally brown or blackish brown; stem long, equal or slightly tapering upward, stuffed or hollow, terminating below in an abrupt, flattened bulb, white, the annulus usually ample but variable, flabby, entire or lacerated, tomentose and yellowish on the lower surface, thin next the stem; spores brown, elliptic, .00024 to .0003 of an inch long, .00016 broad.

The abrupt mushroom is very closely related to the forest mushroom, *A. sylvicola*, from which it may be separated by the abrupt, flattened bulb of the stem and the tomentose character of the collar. It is also liable to be confused with the field mushroom, *A. arvensis*, but from this also it may be distinguished by its peculiar bulb, by its thinner and more fragile cap and by its place of growth. It is found in thin woods or along their borders and occurs from July to September. It is either solitary, gregarious or caespitose in its mode of growth.

Its cap is generally quite regular and well formed though rather thin and fragile. Its surface is smooth or slightly silky fibrillose, white when fresh but apt to assume a yellowish hue in old or dried specimens. The flesh is white. The gills are rather narrow and commonly a little broader in the middle than at either end. They are free from the stem and are so closely placed by the side of one another that they might almost be described as crowded. In the very young or button state they are whitish, but on exposure they soon become pink and finally assume the dark brown or black-

ish brown color common to the mature gills of all the species of this group. The stem is long, furnished with a collar and terminates at the base in an abrupt flattened bulb. This bulb is suggestive of the specific name and is a very available character by which to separate this mushroom from closely allied species. The stem is smooth or minutely flocculent or mealy, stuffed or hollow, equal or slightly tapering upward and white. Its collar is generally large and flabby, softly flocculent or woolly on the lower surface, which is yellowish, rather thick toward the margin and thinner toward the stem. Sometimes it separates readily from the margin of the cap as the latter expands, in which case it adheres to the stem as an entire but flabby collar. In other cases it adheres more firmly to the margin of the cap and becomes torn by its expansion, leaving a partial or lacerated collar on the stem and ragged fragments attached to the margin. The woolly layer of the lower surface sometimes separates in flakes of radiating patches, as in the field mushroom. Because of this character and other points of resemblance between the two species, this mushroom was considered a variety of the field mushroom in report 48, p. 141, and named variety *abruptus*. In report 36, p. 47 it was confused with *Agaricus silvicola*, with which it agrees very closely, but from which it may be separated by the flattened bulb of its stem and the double character of its collar. The cap is 2 to 4 inches broad; the stem 3 to 5 inches long, 3 to 6 lines thick.

Its flavor is considered inferior to that of the common mushroom, *A. campester*, but it is worthy of acceptance as a fairly good mushroom.

*Agaricus silvicola* Vitt.

FOREST MUSHROOM

PLATE 59, fig. 1-7

Pileus convex or expanded, smooth or slightly silky, white, flesh white; lamellae thin, close, rounded behind, free, pinkish when young, becoming darker with age, finally brown or blackish brown; stem long, equal, smooth, stuffed or hollow, bulbous, white; spores elliptic, .0003 of an inch long, .00016 broad.

The forest mushroom has been regarded by some mycologists as a variety of the common mushroom, from which it is easily distinguished by



its longer, hollow bulbous stem and by its place of growth. It is more closely allied to the abrupt mushroom, from which it is separated by its simple collar and by the oval bulb at the base of the stem. It grows in woods and groves and appears in August and sometimes as late as September. Its cap is white and smooth, often shining and sometimes with a slight yellowish tint, specially when old or dry. The flesh is rather thin and white. In the European plant it is said to assume a slight, reddish tint on exposure to the air, but I have not verified this character in our plant. In size and mode of growth it is very similar to the abrupt mushroom.

**Hypholoma incertum** !%.

UNCERTAIN HYPHOLOMA

PLATE 60, figs. 1-2

Pileus thin, fragile, at first ovate or subcampanulate, then broadly convex, hygrophanous, whitish, often tinged with yellow, commonly white when dry, the thin margin often wavy, lobed or irregular and in the young plant adorned with fragments of the white, floccose, fugacious veil, flesh white; lamellae thin, narrow, close, adnate, at first whitish, then purplish brown; stem equal, hollow, easily splitting, white or whitish; spores elliptic, .0003 of an inch long, .0002 broad.

The thin fragile cap is sometimes split on the margin. It has a moist appearance when young and fresh, but this is lost with age and in dry weather. The prevailing color is white, but a yellow tint is often added, specially in the center. The surface is occasionally slightly radiately wrinkled. The margin is sometimes curved upward, and a faint purplish tint, apparently due to the color of the mature gills, is sometimes seen. In the young plant floccose fragments of the ruptured veil adhere to it, but these soon disappear.

The gills when young are nearly white, but they become darker with advancing age and when fully mature are purplish brown. They are attached to the stem by their entire width.

The stem is slender, cylindric, hollow and white. The cap is 1 to 2.5 inches broad; the stem 1 to 3 inches long, 1 to 3 lines thick. It grows in groups or in clusters in lawns, gardens, copses and pastures and may be found

throughout the season if the weather is sufficiently wet. Its flesh is tender but not highly flavored, yet it may well be regarded as a very good mushroom.

It bears such a close external resemblance to Candolle's *hypholoma*, *H. candolleanum*, that it has been thought by some to be a variety of it. This close similarity is suggestive of the specific name. It differs from that species in having the young gills white or whitish instead of violaceous and in the gills being adnate instead of adnexed. In the color of the gills and in the character of their attachment to the stem the species makes an approach to a similarity with the appendiculate *hypholoma*, *H. appendiculatum*, so that it really holds a place intermediate between this and Candolle's *hypholoma*. Its paler color and more even dry cap separate it from the appendiculate *hypholoma*. Its habitat is also different, and it is not so apt to grow in tufts.

***Hypholoma perplexum* Pk.**

PERPLEXING HYPHOLOMA

PLATE 60, figs. 10-17

Pileus convex or nearly plane, glabrous, sometimes broadly and slightly umbonate, reddish or brownish red, fading to yellow on the margin, the flesh white or whitish; lamellae thin, close, slightly rounded at the inner extremity, at first pale yellow, then tinged with green, finally purplish brown; stem nearly equal, firm, hollow, slightly fibrillose, whitish or yellowish above, ferruginous, reddish or reddish brown below; spores elliptic, purplish brown, .0003 of an inch long, .00016 broad.

The perplexing *hypholoma* has received this name because it is one of a group of five or six very closely allied species, whose separation from each other is somewhat difficult and perplexing. Of these six species three have a decidedly bitter, unpleasant flavor, and three are mild, or not decidedly bitter, if we may rely on the published descriptions of them. The three bitter ones, also, have no purplish tints to the mature gills; but two of the mild ones have. By using these and other distinguishing characters, the six species may be tabulated and their several peculiarities more clearly shown.

Taste bitter.....	1
Taste mild or not clearly bitter.....	3
1 Stem solid or stuffed, flesh whitish, gills whitish, then sooty olive.....	<i>sublateritium</i>
1 Stem hollow, flesh yellow.....	2
2 Cap yellow or tinged with tawny, stem yellow, gills yellow, becoming greenish.....	<i>fasciculare</i>
2 Cap brick red, stem ferruginous, gills green, becoming olive.....	<i>clavodes</i>
3 Cap red or brick red, with a yellow margin; gills yellow, then greenish, finally purplish brown.....	<i>perplexum</i>
3 Cap yellow, or slightly tawny on the disk only.....	4
4 Gills gray, becoming purplish brown.....	<i>capnoides</i>
4 Gills yellow, becoming gray, neither green nor purplish.....	<i>epixanthum</i>

Probably, in general appearance, the perplexing hypholoma most nearly resembles the brick red hypholoma, *H. sublateritium*; but it has often been mistaken for the tufted hypholoma, *H. fasciculare*. From this it may be separated by the more red cap, the whitish flesh, the purplish brown color of the mature gills, and the mild flavor. From *H. sublateritium* it is distinguished by its usually smaller size, more slender hollow stem, the yellow greenish and purplish tints of the gills, and the absence of a bitter flavor.

Its cap is 1 to 3 inches broad; its stem 2 to 3 inches long and 2 to 4 lines thick. It commonly grows in clusters, though sometimes singly, on or about old stumps or prostrate trunks of trees, in woods or open places. The caps of the lower ones in a cluster are often defiled and apparently discolored by the spores that have lodged on them from the upper ones. It appears in autumn, and continues till freezing weather stops its growth. It is a very common species, as well as a late one, and may often be gathered in large quantity. Its flavor is not first quality, but with good preparation it makes a very acceptable dish. It has been tested by myself and correspondents several times, and has been proved harmless. A correspondent communicates the following recipe for its preparation:

Put one dessert spoonful of vinegar in a quart of water. Soak the mushroom caps in this mixture 20 minutes. Then take them out and stew slowly for half an hour in a covered vessel, adding butter, pepper and salt to suit the taste. A small quantity of onion is thought by some to improve the flavor, and a thickening of flour and milk just before serving is an improvement.

**Boletinus pictus** *Pk.*

## PAINTED BOLETINUS

PLATE 61, *fig. 1-5*

Pileus convex or nearly plane, at first covered with a red, fibrillose tomentum, soon spotted with red, fibrillose scales, flesh yellowish; tubes tenacious, adnate, pale yellow, becoming darker or ochraceous with age, their mouths rather large, angular; stem cylindric, solid, slightly and evanescently annulate by the remains of the fibrillose or webby veil, yellow and glabrous above the annulus, clothed and colored like the pileus below it; spores ochraceous, .00035 to .00045 of an inch long, .00016 to .0002 broad.

The painted boletinus is a beautiful and easily recognized species. The cap of the young plant is wholly covered by a red, fibrillose tomentum, which soon separates into tufts or scales and reveals the yellowish color of the surface beneath. In the very young plant the tomentum of the cap is continuous with that of the stem and conceals the young tubes. This connecting part of the tomentum is usually of a paler or grayer color than the rest. With the expansion of the cap it separates from the margin and clings to the stem, forming a kind of fibrillose or webby collar around it. This collar is apt to disappear with age. The flesh of the cap is yellowish, and when cut or broken and exposed to the air it sometimes slowly assumes a dull reddish color.

The tubes of the young plant are pale yellow, but when mature they are ochraceous. Their mouths are angular, and the edges of the dissepiments are uneven. The stem is cylindric or sometimes slightly thicker at the base than at the top. It is yellow at the top but colored and clothed like the cap below the slight collar. The cap is 2 to 4 inches broad; the stem 1.5 to 3 inches long, 3 to 6 lines thick. The species inhabits woods and mossy swamps. It is most often found under or near pine trees and occurs from July to September. The tubes near the margin of the cap do not separate easily from it, and in preparing the caps for cooking it is not necessary to reject the tubes. The plants do not retain their color well in drying.

**Boletinus grisellus** /%.

## GRAYISH BOLETINUS

PLATE 52, *figs. 15-19*

Pileus convex, becoming nearly plane, dry, slightly hairy-squamulose, whitish or grayish, flesh whitish; tubes adnate or slightly decurrent, grayish, becoming darker with age, the mouths rather large, angular; stem equal or slightly tapering upward, solid, whitish or pallid; spores ferruginous brown, oblong or elliptic, .0003 to .0004 of an inch long, .00016 to .0002 broad.

The grayish boletinus grows under or near tamarack trees and occurs late in the season. Our specimens were found in October. They were associated with the showy boletus and the Elba boletus. The cap is dingy white or grayish, sometimes tinged with yellow. The surface is not at all viscid and is nearly naked, its adornments consisting only of a few hair-like fibrils or hairy squamules. The flesh is white and unchangeable in color on exposure to the air. The tubes are at first grayish or grayish white, but they become brown with age. The stem is short, solid, whitish or pallid and often slightly reticulated at the top by the decurrent walls of the tubes. When young, there are traces of a slight, webby or fibrillose collar near the top, but these soon disappear. The cap is 1 to 3 inches broad; the stem 1 to 2 inches long, 3 to 5 lines thick. The plants are apparently very scarce, and, though very good as an edible mushroom, they are not likely to be found often or in great abundance.

**Boletus subaureus** /%.

## PALE GOLDEN BOLETUS

PLATE 51, *figs. 6-13*

Pileus broadly convex or nearly plane, glabrous, viscid, pale yellow, flesh pale yellow; tubes nearly plane in the mass, adnate or slightly decurrent, pale yellow becoming dingy ochraceous, their mouths small, subangular; stem short, stout, equal, solid, glandular-dotted, yellow; spores oblong or subfusiform, .0003 to .0004 of an inch long, .00016 broad.

The pale golden boletus belongs to a group of closely related species, in which the specific distinctions are not strongly marked, but no dangerous species is known among them, though not all are agreeably flavored. They

are of medium size, with viscid caps, yellow or ochraceous tubes and glandular dotted stems. The species now under consideration has a yellow, viscid cap which when young usually has a few flakes or fragments of the pale woolly veil on the margin. Sometimes it becomes spotted by the drying of the viscid substance on it. The flesh is pale yellow, and the tubes are at first pale yellow with small mouths, but they become darker or dingy ochraceous with age, and their mouths become larger and angular. The stem is nearly cylindric, short, stout, solid, collarless, glandular dotted and yellow both externally and internally. The dots are generally brown or yellowish and brown intermingled, and they are sometimes arranged in an obscurely reticulated manner. This boletus grows under or near pine trees or in places formerly occupied by them. It may be found in suitable weather during July and August. The caps are 2 to 4 inches broad; the stem 1.5 to 2.5 inches long, 4 to 6 lines thick. It most resembles the American boletus, *B. americanus*, from which it may be separated by its thicker stem and cap, smaller and brighter colored tubes and more agreeable flavor. On account of its disagreeable flavor when raw, I have hesitated to test the edibility of the American boletus, though it is a common species in pine regions. Possibly its disagreeable flavor would be destroyed by cooking.

***Boletus clintonianus* Pk.**

CLINTON'S BOLETUS

PLATE 63, fig. 1-8

Pileus convex, very viscid or glutinous, glabrous, golden yellow, reddish yellow or chestnut color, flesh pale yellow or whitish, tubes adnate, their mouths small, angular or subrotund, pale yellow when young, ochraceous when mature, changing to brown or purplish brown where bruised; stem equal or slightly thickened at the base, annulate, solid, yellow above the annulus, colored like the pileus below, the annulus thick, persistent, white or whitish; spores brownish ochraceous, .0004 to .00045 of an inch long, .00016 to .0002 broad.

Clinton's boletus is variable in color. In the typical form the color is reddish brown or chestnut, but specimens occur in which it is reddish yellow or even golden yellow. The surface of the cap is very viscid when

moist, smooth and shining when dry. The flesh is whitish or pale yellow, but it is apt to fade or become dingy by exposure to the air. The taste is mild.

The tubes are at first concealed by the thick veil. This soon separates from the margin of the cap and forms a thick, persistent collar on the stem. When first exposed the tubes are pale yellow, but they become ochraceous or dingy ochraceous in the mature plant. Their mouths are small and nearly round.

The stem is stout, solid and nearly equal in thickness in all its parts. It may be straight or flexuous. It is yellow above the collar and colored like the cap below it. Sometimes the extreme apex is slightly reticulated by the decurrent walls of the tubes, but it is not dotted. The cap is 2 to 5 inches broad; the stem 2 to 5 inches long, 4 to 6 lines thick. This boletus grows in woods and in open places and is generally found under or near tamarack trees. It is specially fond of damp, mossy places, and occurs from July to September. Because of their viscidness, the caps are often soiled by adhering dirt or fragments of leaves. It is well therefore to peel them in preparing them for the table and to remove the tubes. It is excellent in flavor and is a fine addition to our list of edible species.

***Boletus spectabilis* Pk.**

SHOWY BOLETUS

PLATE 62, Figs. 1-7

Pileus at first hemispheric, covered by a red, tomentose veil, becoming broadly convex or nearly plane and squamose by the breaking up of the tomentum, viscid when moist, red, sometimes fading to yellow, flesh pale yellow; tubes adnate, pale yellow when young, becoming dingy ochraceous with age, their mouths at first small, then larger and angular; stem equal or nearly so, solid, annulate, red below the annulus, yellow above and within; spores purplish brown, .0005 to .0006 of an inch long, .00025 to .0003 broad.

The showy boletus is an attractive species, but it is not very common. It grows in swamps and wet places under or near tamarack trees, and occurs from July to October. It is northern in its range and till the present season

was not known to occur in our state south of the Adirondack region. It has recently been found in Albany county, in the swamps near the eastern base of the Helderbergs.

The cap when young is covered with a woolly coat, or veil, which soon separates and forms wart-like scales, revealing the red surface of the cap, which is viscid when moist. In the young plant the tubes are concealed by a filmy membrane, but this soon separates from the margin of the cap and forms a collar on the upper part of the stem. With advancing age the cap expands till it is broadly convex or nearly flat, and sometimes its color fades to yellow, either wholly or on the margin only. The scales also sometimes lose their color and become paler than the cap, and sometimes they are yellowish even in young specimens. The flesh is pale yellow, but sometimes a little brighter next the tubes. The tubes are nearly plane at first, pale yellow and with small mouths, but when mature the color is a dark ochraceous, and the mouths are rather large and angular. An obscure radiating structure is perceptible, as if the tubes were formed by radiating gills connected by numerous transverse partitions. The stem is cylindrical or tapering upward, solid and firm and adorned with a thick collar near the top. It is red below the collar and yellow above and within. The collar is somewhat viscid and apt to become blackish when old.

The cap is 2 to 5 inches broad; the stem 2 to 5 inches long, 4 to 6 lines thick. In the raw state the flavor of the flesh is slightly disagreeable, but when cooked the disagreeable flavor wholly disappears, and the species may be regarded as an excellent addition to the list of edible mushrooms. It is a well marked species and not liable to be confused with any other. It is said to be plentiful in some places in Canada.

***Boletus subglabripes* *Pk.***

SMOOTHISH STEMMED BOLETUS

PLATE 64, *fig. 1-10*

Pileus convex or nearly plane, glabrous, reddish, sometimes inclining to pale chestnut color, flesh white or yellowish, unchangeable; tubes adnate, nearly plane in the mass, pale yellow, becoming convex and darker or greenish yellow with age, the mouths small, subrotund; stem equal, solid,



furfuraceous, pale yellow; spores oblong or subfusiform, .0005 to .0006 of an inch long, .00016 to .0002 broad.

The smoothish stemmed boletus is well marked by its cylindric, minutely scurfy stem, which is colored like the tubes. Its cap is smooth and nearly always some shade of red or bay. Specimens occur occasionally in which it approaches grayish brown or wood brown. The flesh is white or yellowish, and unchangeable when cut or broken.

The tubes at first have a nearly plane surface but this becomes somewhat convex with age, and slightly depressed around the stem. The tube mouths are small and nearly round. The color of the tubes is at first a beautiful pale yellow but it becomes darker or slightly greenish yellow with age.

The stem is colored very nearly like the tubes, but sometimes it has a slight reddish tint toward the base. Its peculiar feature consists of the minute, branny particles on it. They are so small and pale that they are easily overlooked.

There is a variety in which the cap is corrugated or irregularly pitted and wrinkled. Its name is *Boletus subglabripes corrugis* Pk.

The cap is 1.5 to 4 inches broad; the stem is 2 to 3 inches long and 4 to 8 lines thick. The plants are found in woods in July and August.

***Boletus edulis clavipes* Pk.**

CLUB STEMMED BOLETUS

PLATE 65, figs. 1-8

Pileus fleshy, convex, glabrous, grayish red, bay red or chestnut color, flesh white, unchangeable; tubes at first concave or nearly plane, white and stuffed, then convex, slightly depressed around the stem, ochraceous yellow; stem mostly obclavate and reticulate to the base; spores oblong fusiform, .0005 to .0006 of an inch long, .00016 to .0002 broad.

The club stemmed boletus is so closely related to the edible boletus and so closely connected by intermediate forms that it seems to be only a variety of it, but one worthy of illustration. It differs in the more uniform color of the cap, in having the tubes less depressed around the stem and less tinted with green when mature and in having the stem more club-shaped and commonly reticulated to the base. The lower reticulations are usually coarser

but less permanent than the upper. The cap is more highly colored when young and is apt to become paler with age, but the margin does not become paler than the central part, as it so often does in the edible boletus. Individuals sometimes occur in which the stem is nearly cylindrical and reticulated only on the upper part. These connect so closely with the edible boletus that we have considered this to be a mere variety of it. In size and in edible qualities it is very similar to that species.

**Boletus brevipes** *Pk.*

SHORT STEMMED BOLETUS

PLATE 66, *fig. 1-6*

Pileus convex, covered with a thick, tough gluten when young or moist, dark chestnut color, sometimes fading to dingy tawny with age, the margin inflexed, flesh white or tinged with yellow; tubes short, adnate, small, subrotund, at first whitish, then dingy ochraceous; stem short, solid, not dotted or sometimes with a few very minute, inconspicuous dots at the apex, whitish; spores subfusiform, .0003 of an inch long, .00012 broad.

The short stemmed boletus is a near relative to the granulated boletus, *B. granulatus*, from which it differs specially in the darker color of the cap, the more copious gluten, the shorter stem and the absence of any conspicuous dots or granules from the stem. Its cap is commonly 1.5 to 2.5 inches broad; its stem .5 to 1 inch long and 3 to 5 lines thick. It grows in sandy soil under or near pine trees or in pine groves or woods and appears late in autumn. The stems are so short that the cap seems to rest directly on the ground. It is usually defiled by dirt, sticks and leaves which adhere tenaciously to the gluten.

The caps should be peeled and the tubes removed before cooking.

**Boletus affinis** *Pk.*

RELATED BOLETUS

PLATE 66, *fig. 7-14*

Pileus convex above or nearly plane, subglabrous, reddish brown or chestnut color, fading to tawny or dingy ochraceous with age, flesh white; tubes plane or convex, adnate or slightly depressed around the stem, at first white and stuffed, then glaucous yellow or subochraceous, changing to rusty

ochraceous where wounded; stem subequal, even, glabrous, colored like or paler than the pileus; spores rusty ochraceous, .00035 to .0005 of an inch long, .00016 to .0002 broad.

The related boletus belongs to the tribe of boleti known as *Edules* because of their specially esculent character, but it differs from the general character of the tribe in having its tubes not at all or but slightly shortened around the stem and in its stem not being thickened or bulbous at the base. The species is quite variable in the color of the cap, which is generally darker in young plants, paler in old ones. It may be brown, reddish brown or blackish brown when young, but is more or less tinged with tawny or ochraceous when old. It is smooth and even or minutely tomentose and sometimes slightly rugose. In wet weather the margin of the cap sometimes curves upward, giving a very convex surface to the tubes. Sometimes the wounded flesh slowly assumes a yellowish hue. The peculiar rusty ochraceous hue of the spores is also seen sometimes in the tubes of old specimens. As in many species, the flesh of old plants is more soft than that of young ones. The stem is quite variable and is often narrowed downward. It is sometimes very obscurely reticulated at the top.

The cap is generally 2 to 4 inches broad; the stem 1.5 to 3 inches long, 4 to 8 lines thick. The plants are found in thin woods or in bushy places in July and August.

Variety *maculosus* Pk. differs from the type simply in having a few yellowish spots scattered over the cap.

While not as high flavored as some boleti, this is, nevertheless, a fairly good and perfectly safe one.

***Hydnum albidum* Pk.**

WHITISH HYDNUM

PLATE 67, figs. 1-7

Pileus fleshy, thin, broadly convex or nearly plane, subpruinose, white, flesh white; aculei short, white; stem short, solid, central or eccentric, white; spores subglobose, .00016 to .0002 of an inch broad.

The whitish hydnum is uniformly colored. It grows in groups or in clusters. In the latter case the caps are sometimes irregular, because of the crowded mode of growth, and the stems are occasionally eccentric. It is a

small species, not liable to be mistaken for any other except possibly for very small, pale forms of the spreading hydnum. But wholly white examples of this species have never been seen by me.

The caps are 1 to 2 inches broad, and the stems are generally about 1 inch long and 3 to 5 lines thick.

The plants grow in thin woods or in open bushy places and appear in June and July. It is not a common species and, though well flavored, it is not of very great importance as an edible mushroom because of its scarcity and small size.

***Hydnum caput-ursi* Fr.**

BEAR'S HEAD HYDNUM

PLATE 67, fig. 8-12

Fleshy, tuberculiform, immarginate, pendulous, lateral or erect, white, the surface everywhere emitting short branches, which are clothed with branchlets and subulate, deflexed aculei; spores globose or subglobose, .0002 to .00024 of an inch broad.

The bear's head hydnum is intermediate between the coral-like hydnum, *H. coralloides*, on one hand, and the hedgehog hydnum, *H. erinaceus*, and the medusa's head hydnum, *H. caput-medusae*, on the other. By reason of the numerous short branches of its surface it is classed with the branching species of the tribe Merisma, but on account of its thick, fleshy, tuberculiform body it shows a close connection with the unbranched tuberculiform species. The American fungus is not always pendulous, and in this respect it differs from the typical form described by Prof. Fries.

When it grows from the upper side of a prostrate trunk, it is erect or nearly so. When it grows from the side of a standing or of a prostrate trunk, it may be either ascending or pendulous, or it may develop in both directions. The solid body is sometimes elongated and narrow, sometimes short and thick. Its branches are often scarcely more than tuberculiform projections or processes, and the general outline of the whole fungus sometimes bears a striking resemblance in size and shape to the heart of an ox. The spine-like teeth vary much in length. They are generally from 4 to 12 lines long, and point downward. They are longer than in the coral-like hydnum and shorter than in the hedgehog hydnum. The whole plant is white and

beautiful when fresh and young, but with age and in drying it assumes creamy white, yellowish or pale alutaceous hues. It has sometimes been referred to *Hydnum caput-medusae* by American mycologists, but its branching character and the entire absence of grayish or cinereous colors forbid such a reference.

It usually forms masses from 2 to 6 inches thick and high, but it sometimes greatly exceeds these dimensions. It grows on dead or decaying wood of deciduous trees, specially of beech and birch, and is mostly found in woods in summer and autumn.

This species is not classed among the edible mushrooms by European mycologists, and Prof. Fries says that its substance is tough and dry, and that he would scarcely think it edible. My own experiments with it lead me to think it less tender and savory than the coral-like hydnum, still it is agreeable, digestible and harmless and much better than some species that are generally considered very good. Its great mass of firm flesh, free from larvae, clean, white and attractive, gives it value and importance which it would not otherwise have. It may be made specially useful to parties camping in the Adirondack wilderness, who may have become tired of the ordinary fare of the camp or who may be running short of supplies. By cutting it in thin slices it can easily be dried and preserved for future use.

***Craterellus cantharellus* (Schw.) Fr.**

CHANTARELLE CRATERELLUS

PLATE 56, figs. 17-21

Pileus fleshy, firm, convex, often becoming centrally depressed or infundibuliform, glabrous, yellow or pinkish yellow, flesh white; hymenium nearly even, slightly wrinkled, yellow; stem glabrous, solid, yellow; spores subelliptic, .0003 to .0004 of an inch long, .0002 to .00025 broad.

The chantarelle craterellus resembles the true chantarelle so closely in size, shape and color that it might at first sight easily be thought to be an imperfectly developed form of it. The color is yellow as in that plant, but sometimes there is a slight pinkish tint to the cap, and a faint shade of salmon or orange to the spore bearing or under surface of the cap. Its chief distinctive feature is found here, for, instead of the blunt-edged, branch-

ing gills of the chantarelle, it presents an even surface or one rendered slightly uneven by a few longitudinal wrinkles. The plant is more frequently tufted in its mode of growth and this often causes the margin of the cap to be wavy, irregular or lobed. The color of the spores, when collected on a white background, is yellowish or pale salmon.

The cap is 1 to 3 inches broad; the stem 1 to 3 inches high and 3 to 5 lines thick. The plants are found in copses or thin woods in August and September. They are less common than the chantarelle. The flesh of this plant is perhaps a little more tough than that of the chantarelle, but its flavor is scarcely less agreeable.

*Clavaria pistillaris umbonata* *Pk.*

UMBONATE CLAVARIA

PLATE 66, *figs.* 15-17

Club simple, large, thick, fleshy, solid, glabrous, umbonate, ochraceous buff, the umbo reddish brown, flesh white; spores elliptic, .0004 to .0005 of an inch long, .0002 to .00024 broad.

The umbonate clavaria is doubtless a mere variety of the large club clavaria, *C. pistillaris*, from which it is separated by the peculiar bay brown prominence at the apex of the thick, fleshy club. The few specimens seen are about 4 inches long and 1 inch thick in the broadest part. They bear a slight resemblance to a dumb-bell in shape, being thicker near each end than in the middle, but the swelling of the upper part is larger than that at the base. The surface is smooth and the color ochraceous buff, except the umbo. The flesh is firm, white and agreeable in flavor when raw as well as when cooked. It grows in thin woods and was found in September. The species itself is rare with us and somewhat variable in size and shape. The variety is doubtless still more rare, as I have met with it but once. On this account both may be regarded as a table luxury.

## UNWHOLESOME FUNGI

*Clitocybe illudens* Schic.

DECEIVING CLITOCYBE

PLANT. 68, 7

Pileus convex or nearly plane, sometimes depressed in the center, umbonate, glabrous or obscurely virgate, often irregular, bright golden or saffron yellow; lamellae close, decurrent, concolorous; stem rather long, firm, glabrous, solid, commonly narrowed at the base, colored like the pileus; spores globose, .00016 to .0002 of an inch broad.

The deceiving clitocybe is an attractive fungus, forming large tufts or even patches on or about old stumps or decaying wood or roots buried in the ground. It is wholly of a deep, rich, golden yellow or saffron yellow color approaching orange, except that the flesh within is white or yellowish. Its cap is fleshy in the center, where there is often a small umbo, but thin toward the margin, which from its tufted mode of growth is often lobed, wavy, irregular or split. The gills are numerous, narrowed toward each end and some of them are apt to be forked. They run down on the stem and in old or partly dry specimens they are inclined to become discolored on the edge. The stems are rarely equal and regular. Being crowded together, they are more or less compressed, flexuous or crooked and narrowed below to a pointed base, where they are sometimes tinged with brown. They are usually solid, though it is possible to find them stuffed or even hollow in very large or old specimens. Sometimes they are attached eccentrically to the cap. The spores are white and are in some instances shed in such abundance as to whiten the leaves, ground or whatever may be beneath or around the clusters of plants. A strong odor is often perceptible in the presence of large clusters and the flavor of the flesh is not very agreeable.

The caps are usually from 3 to 6 inches broad and the stems 3 to 6 inches long and 3 to 6 lines thick, but sometimes these dimensions are exceeded. Examples have been found having a cap 10 inches across and a stem 10 or 11 inches long. The plants occur from August to October. The

large, bright clusters are easily seen at considerable distances, and the fresh caps appear as if they might be edible, but, according to the experience of two or three of my correspondents, whose courage was greater than their discretion in testing the edibility of this plant, it produces sickness, nausea and vomiting; but it is not dangerous, for, as soon as the unwholesome material is rejected, the system recovers its usual tone.

One correspondent has written me that by parboiling in salt water, then rinsing well and stewing in cream, butter and seasoning, he has been able to eat this mushroom without evil consequences.

The fresh plants are phosphorescent. If placed in a dark room or viewed in the night, the phosphorescent light is plainly perceptible.

### LIST OF PLATES AND SPECIES

#### Edible species

PLATE		
44	✓ Amanitopsis strangulata ( <i>Fr.</i> ) <i>Roze</i>	Strangulated amanitopsis
	✓ Lepiota americana <i>Pk.</i>	American lepiota
45	✓ Tricholoma portentosum centrale <i>Pk.</i>	Central tricholoma
	✓ Tricholoma terreum fragrans <i>Pk.</i>	Fragrant tricholoma
46	✓ Clitocybe clavipes ( <i>Pers.</i> ) <i>Fr.</i>	Club stemmed clitocybe
	✓ C. monadelphæ <i>Morg.</i>	Clustered clitocybe
	✓ C. multiformis <i>Pk.</i>	Multiform clitocybe
47	✓ Collybia velutipes ( <i>Curt.</i> ) <i>Fr.</i>	Velvet stemmed collybia
48	✓ C. radicata ( <i>Rehm.</i> ) <i>Fr.</i>	Rooted collybia
49	✓ C. platyphylla <i>Fr.</i>	Broad gilled collybia
50	✓ Hygrophorus flavodiscus <i>Frost</i>	Yellow disked hygrophorus
	✓ H. fuliginosus <i>Frost</i>	Sooty hygrophorus
	✓ Hygrophorus laricinus <i>Pk.</i>	Larch hygrophorus
51	✓ H. chlorophanus <i>Fr.</i>	Sulfury hygrophorus
	✓ H. speciosus <i>Pk.</i>	Showy hygrophorus
	✓ H. puniceus <i>Fr.</i>	Red hygrophorus
52	✓ H. virgineus ( <i>Wulf.</i> ) <i>Fr.</i>	White hygrophorus
	✓ Boletinus grisellus <i>Pk.</i>	Grayish boletinus
	✓ Lactarius chelidonium <i>Pk.</i>	Celandine lactarius
53	✓ L. distans <i>Pk.</i>	Distant gilled lactarius
	✓ L. gerardii <i>Pk.</i>	Gerard's lactarius
54	✓ Russula roscipes ( <i>Secc.</i> ) <i>Bres.</i>	Rosy stemmed russula
	✓ R. ochrophylla <i>Pk.</i>	Ochery gilled russula



55	✓ <i>Cantharellus cinnabarinus</i> <i>Schae.</i>	Cinnabar chantarelle
	✓ <i>C. floccosus</i> <i>Schae.</i>	Floccose chantarelle
	✓ <i>C. lutescens</i> <i>Fr.</i>	Yellowish chantarelle
56	✓ <i>C. infundibuliformis</i> ( <i>Scop.</i> ) <i>Fr.</i>	Funnel form chantarelle
	✓ <i>Craterellus cantharellus</i> ( <i>Schae.</i> ) <i>Fr.</i>	Chantarelle craterellus
57	✓ <i>Pholiota praecox</i> ( <i>Pers.</i> ) <i>Fr.</i>	Early pholiota
	✓ <i>P. adiposa</i> <i>Fr.</i>	Fat pholiota
58	✓ <i>Cortinarius evernius</i> <i>Fr.</i>	Well grown cortinarius
	✓ <i>C. corrugatus</i> <i>Pk.</i>	Corrugated cortinarius
59	✓ <i>Agaricus silvicola</i> <i>Vitt.</i>	Forest mushroom
	✓ <i>A. abruptus</i> <i>Pk.</i>	Abrupt mushroom
60	✓ <i>Hypoholoma incertum</i> <i>Pk.</i>	Uncertain hypoholoma
	✓ <i>H. perplexum</i> <i>Pk.</i>	Perplexing hypoholoma
61	✓ <i>Boletinus pictus</i> <i>Pk.</i>	Painted boletinus
	✓ <i>Boletus subaureus</i> <i>Pk.</i>	Pale golden boletus
62	✓ <i>B. spectabilis</i> <i>Pk.</i>	Showy boletus
63	✓ <i>B. clintonianus</i> <i>Pk.</i>	Clinton's boletus
64	✓ <i>B. subglabripes</i> <i>Pk.</i>	Smoothish stemmed boletus
65	✓ <i>B. edulis clavipes</i> <i>Pk.</i>	Club stemmed boletus
	✓ <i>B. brevipes</i> <i>Pk.</i>	Short stemmed boletus
66	✓ <i>B. affinis</i> <i>Pk.</i>	Related boletus
	✓ <i>Clavaria pistillaris umbonata</i> <i>Pk.</i>	Umbonate clavaria
67	✓ <i>Hydnum albidum</i> <i>Pk.</i>	White hydnum
	✓ <i>H. caput-ursi</i> <i>Fr.</i>	Bear's head hydnum

#### Unwholesome species

68	✓ <i>Clitocybe illudens</i> <i>Schae.</i>	Deceiving clitocybe
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EXPLANATION OF PLATES

PLATE 41

**Amanitopsis strangulata** (*Fr.*) *Rose*

## STRANGULATED AMANITOPSIS

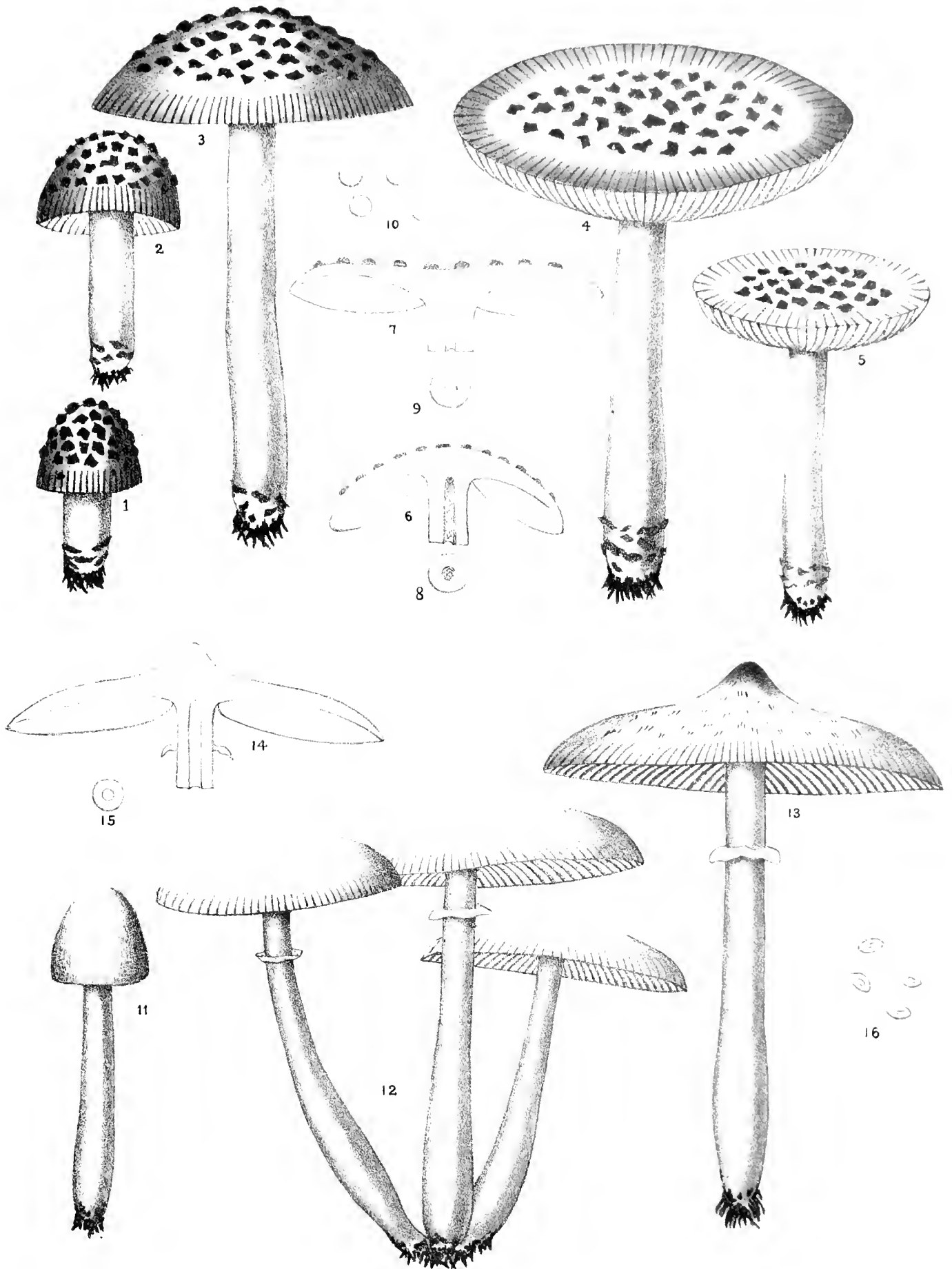
FIGURE

- 1, 2 Young plants
- 3 Plant with the cap partly expanded
- 4, 5 Plants with caps fully expanded
- 6 Vertical section of the upper part of an immature plant
- 7 Vertical section of the upper part of a mature plant
- 8, 9 Transverse section of two stems, one stuffed, the other hollow
- 10 Four spores  $\times 400$

**Lepiota americana** *Pk.*

## AMERICAN LEPIOTA

- 11 Young plant
- 12 Cluster of three plants
- 13 Mature plant with the color assumed in drying
- 14 Vertical section of the upper part of a mature plant
- 15 Transverse section of a stem
- 16 Four spores  $\times 400$



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FIG. 1 TO 10 *AMANITOPSIS STRANCULATA* (FR.) ROZE  
STRANGULATED AMANITOPSIS

FIG. 11 TO 16 *LEPIOTA AMERICANA* PK.  
AMERICAN LEPIOTA



PLATE 45

**Tricholoma portentosum centrale** *Pk.*

## CENTRAL TRICHOLOMA

FIGURE

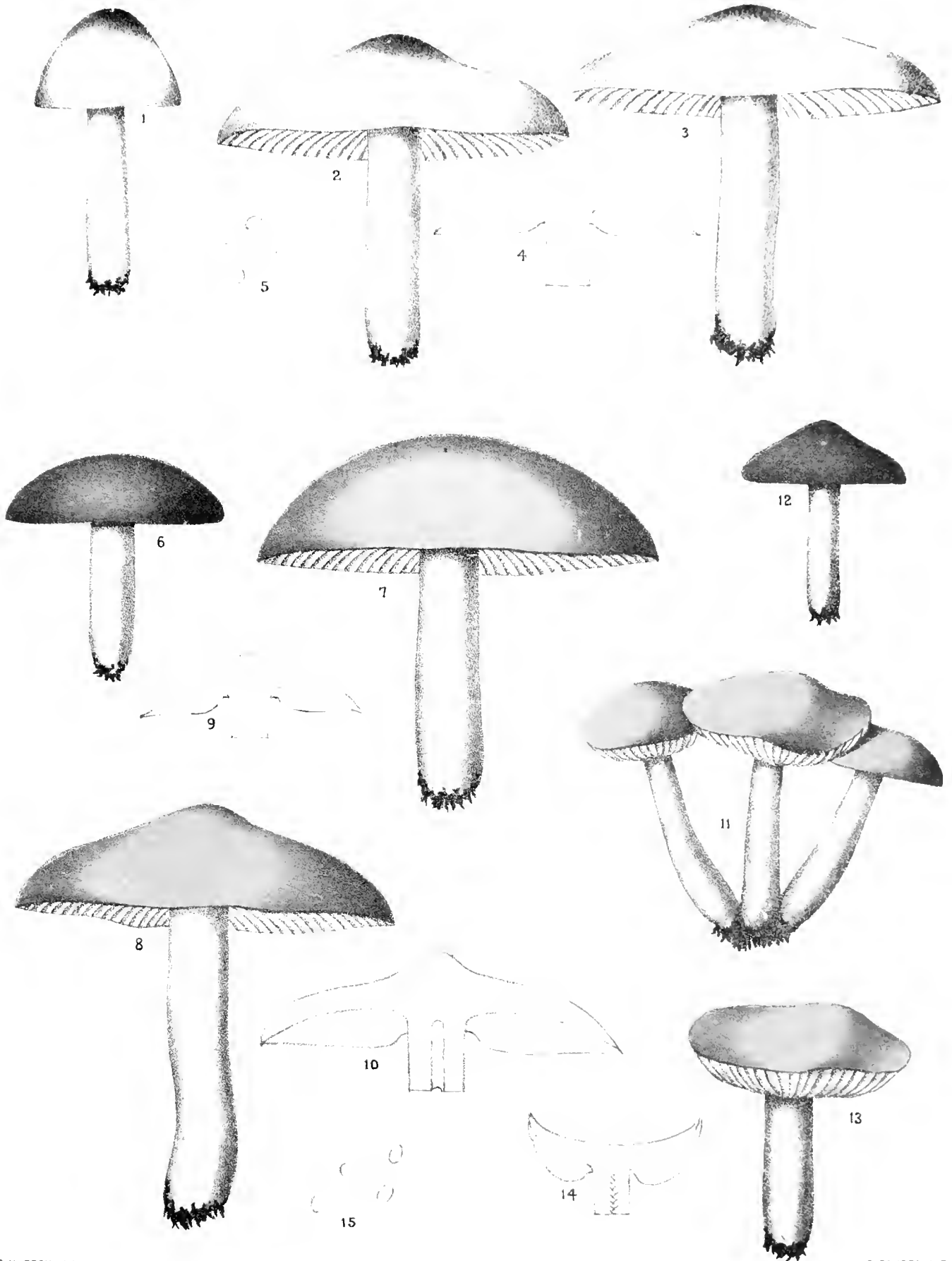
- 1 Young plant
- 2, 3 Two mature plants
- 4 Vertical section of the upper part of a plant
- 5 Four spores  $\times$  400

**Tricholoma terreum fragrans** *Pk.*

## FRAGRANT TRICHOLOMA

- 6 Young plant
- 7, 8 Two mature plants
- 9 Vertical section of the upper part of a young plant
- 10 Vertical section of the upper part of a mature plant with an umbonate cap
- 11 Cluster of three plants of small size
- 12 Small plant with cap partly expanded
- 13 Small plant with cap fully expanded
- 14 Vertical section of the upper part of a small but fully matured plant
- 15 Four spores  $\times$  400





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FIG. 1 TO 5 *TRICHOLOMA PORTENTOSUM CENTRALE* PK  
CENTRAL TRICHOLOMA

FIG. 6 TO 15 *TRICHOLOMA TERREUM FRAGRANS* PK  
FRAGRANT TRICHOLOMA

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PLATE 46

**Clitocybe clavipes** (Pers.) Fr.

## CLUB-STEMMED CLITOCYBE

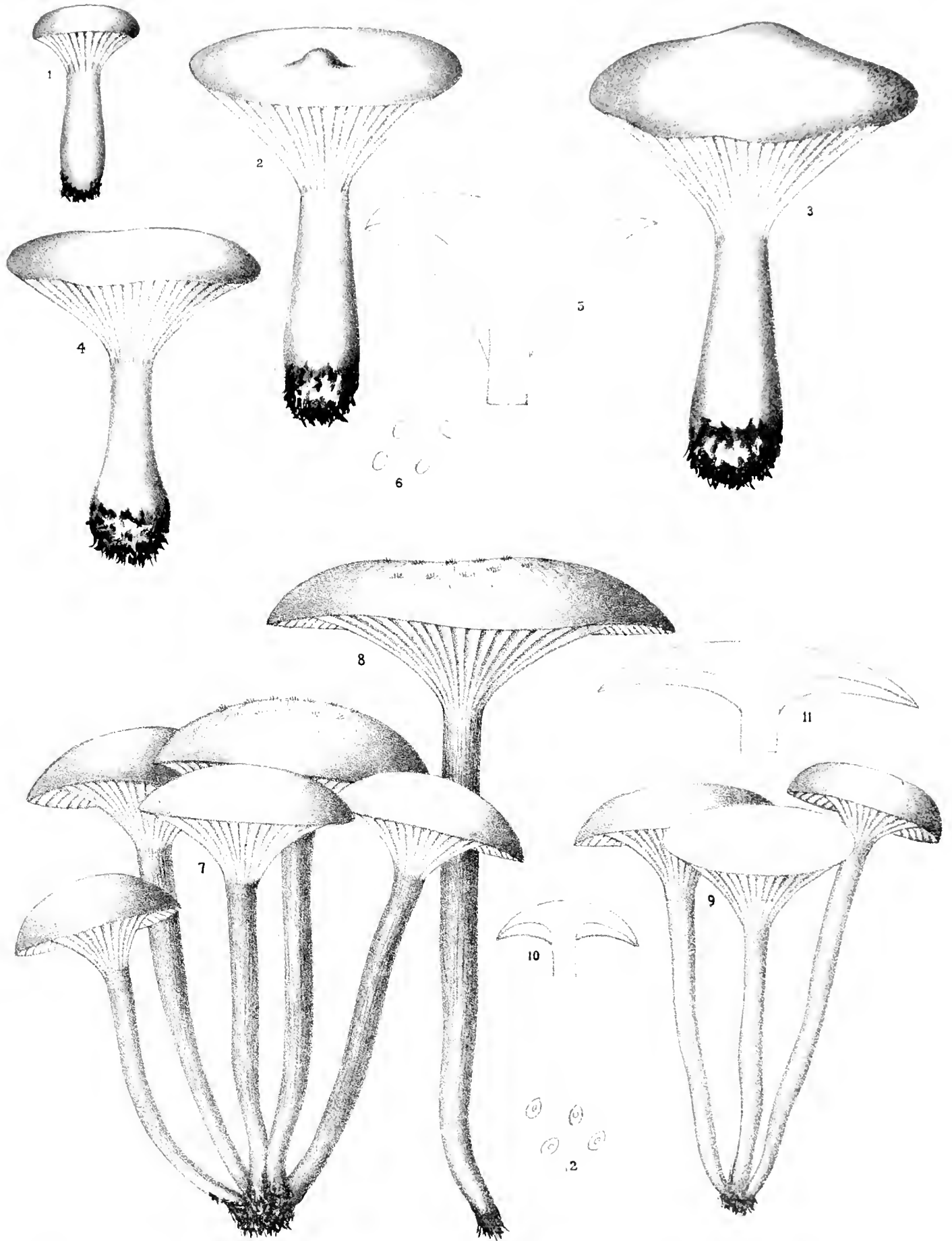
FIGURE

- 1 Young plant
- 2-4 Three mature plants, one with an umbonate cap
- 5 Vertical section of the upper part of a plant
- 6 Four spores  $\times 400$

**Clitocybe monadelpha** Morg.

## CLUSTERED CLITOCYBE

- 7 Cluster of five plants, two of them with scales and fibrils on the cap
- 8 Large mature plant
- 9 Cluster of three plants with pale caps
- 10 Vertical section of the upper part of a small plant
- 11 Vertical section of the upper part of a large plant
- 12 Four spores  $\times 400$



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FIG. 1 TO 6 CLITOCYBE CLAVIPES (PERS.) FR.  
CLUB STEMMED CLITOCYBE

FIG. 7 TO 12 CLITOCYBE MONADELPHA MORG.  
CLUSTERED CLITOCYBE



PLATE 47

**Clitocybe multiformis** *Pk.*

## MULTIFORM CLITOCYBE

FIGURE

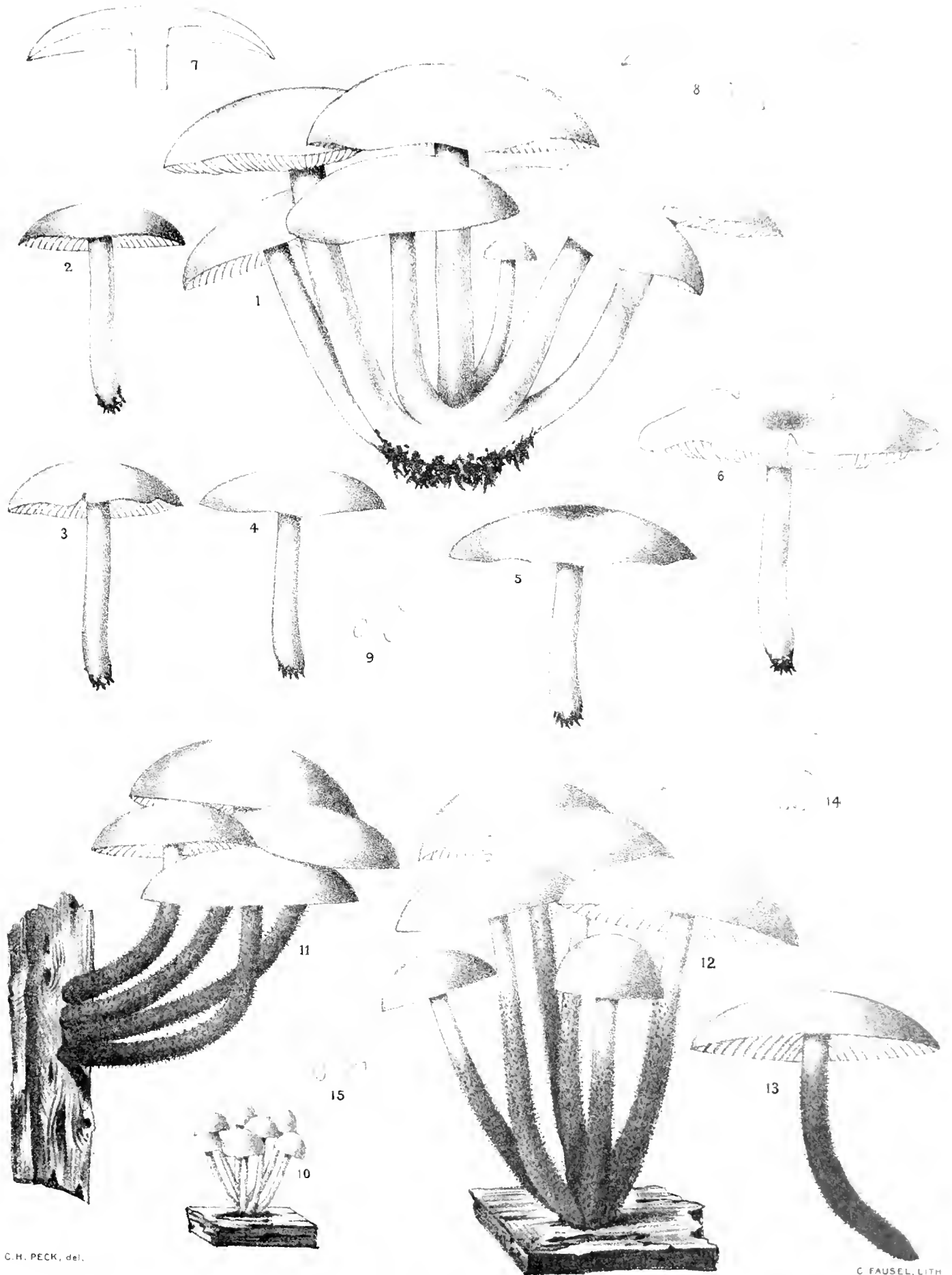
- 1 Cluster of seven plants
- 2 Single plant
- 3, 4 Two plants with yellowish caps
- 5, 6 Two plants with whitish caps having a dark center
- 7, 8 Vertical section of the upper part of two plants
- 9 Four spores  $\times 400$

**Collybia velutipes** (*Curt.*) *Fr.*

## VELVET STEMMED COLLYBIA

- 10 Cluster of seven young plants
- 11 Cluster of four mature plants
- 12 Cluster of six plants, two of them immature
- 13 Single mature plant
- 14 Vertical section of the upper part of a plant
- 15 Four spores  $\times 400$





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FIG. 1 TO 9 CLITOCYBE MULTIFORMIS PK.  
MULTIFORM CLITOCYBE

FIG. 10 TO 15 COLLYBIA VELUTIPES (CURT.) FR.  
VELVET STEMMED COLLYBIA



PLATE 48

**Collybia radicata** (Rehder) Fr.

## ROOTED COLLYBIA

FIGURE

- 1 Young plant
  - 2 Mature plant with cap umbonate and radiately wrinkled in the center
  - 3 Plant with a white cap
  - 4, 5 Vertical sections of the upper parts of two plants
  - 6, 7 Transverse section of two stems, one stuffed, the other hollow
  - 8 Four spores  $\times 400$
- var. **furfuracea** Fr.
- 9 Plant with cap partly expanded, umbonate and centrally wrinkled
  - 10 Plant with cap fully expanded
  - 11 Four spores  $\times 400$
- var. **pusilla** Fr.
- 12 Plant with cap partly expanded
  - 13 Plant with cap fully expanded
  - 14 Four spores  $\times 400$



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COLLYBIA RADICATA (RELH.) FR.  
ROOTED COLLYBIA



PLATE 49

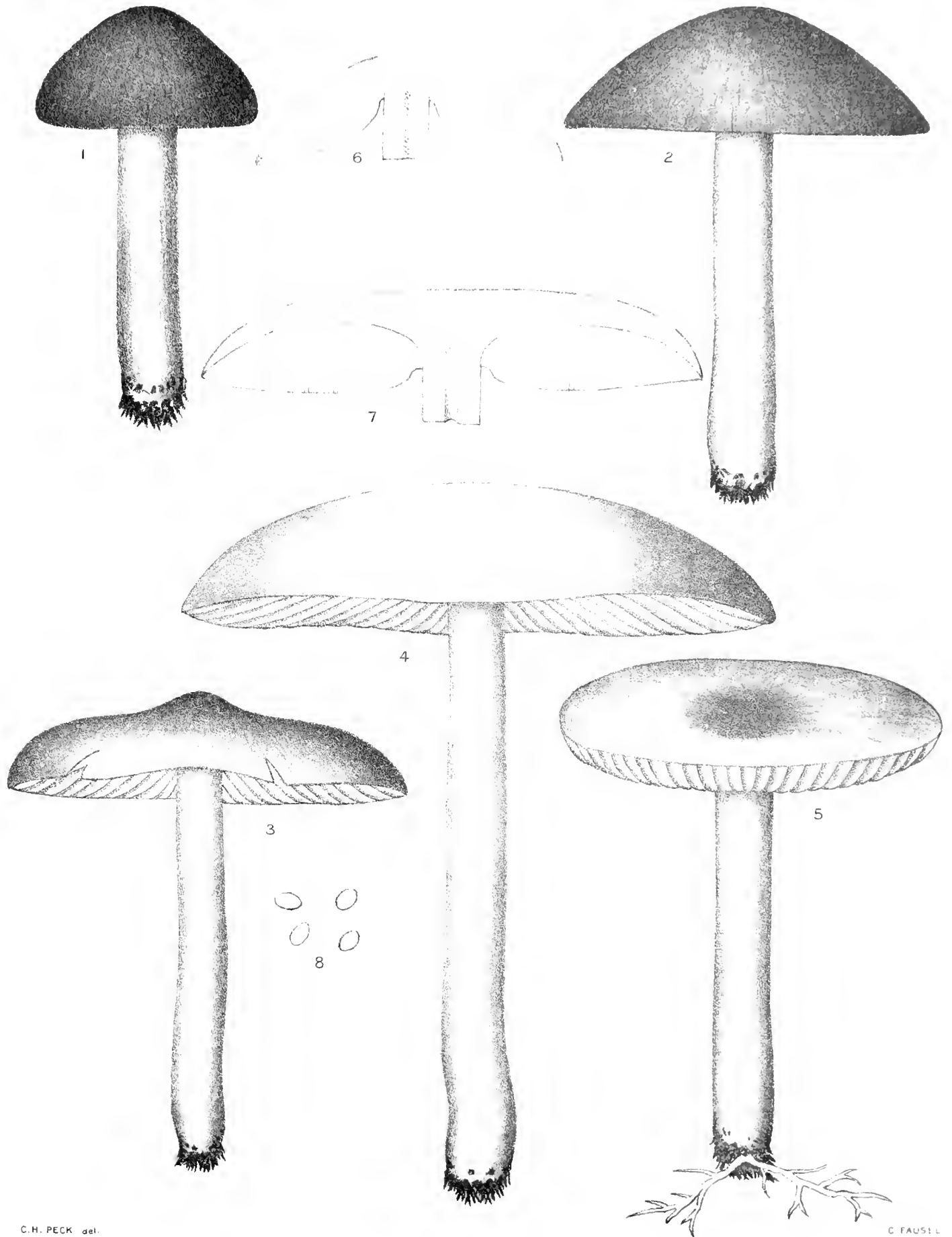
*Collybia platyphylla* Fr.

## BROAD GILLED COLLYBIA

FIGURE

- 1, 2 Two immature plants
- 3, 4 Two mature plants, one with cap umbonate and centrally blackish
- 5 Mature plant with cap fully expanded and darker in the center
- 6 Vertical section of the upper part of an immature plant
- 7 Vertical section of the upper part of a mature plant
- 8 Four spores  $\times 400$





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COLLYBIA PLATYPHYLLA FR.  
BROAD GILLED COLLYBIA



PLATE 50

**Hygrophorus flavodiscus** *Frost*

## YELLOW DISKED HYGROPHORUS

FIGURE

- 1 Young plant
- 2-4 Mature plants
- 5 Vertical section of the upper part of a plant
- 6 Four spores  $\times 400$

**Hygrophorus fuligineus** *Frost*

## SOOTY HYGROPHORUS

- 7 Immature plant
- 8-10 Mature plants, one with cap centrally blackish
- 11 Vertical section of the upper part of a plant
- 12 Four spores  $\times 400$



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FIG. 1 TO 6 *HYGROPHORUS FLAVODISCUS* FROST  
YELLOW DISKED HYGROPHORUS

FIG. 7 TO 12 *HYGROPHORUS FULIGINOSUS* FROST  
SOOTY HYGROPHORUS



PLATE 54

**Hygrophorus laricinus** *Pk.*

## LARCH HYGROPHORUS

- FIGURE
- 1 Young plant
  - 2, 3 Mature plants, one with umbonate cap
  - 4 Young plant with reddish band near the margin of the cap
  - 5, 6 Mature plants with a reddish band on the caps, one with umbonate cap
  - 7, 8 Plants with caps yellowish on the margin
  - 9, 10 Vertical sections of the upper parts of two plants
  - 11 Transverse section of a stem
  - 12 Four spores  $\times 400$

**Hygrophorus chlorophanus** *Fr.*

## SULFURY HYGROPHORUS

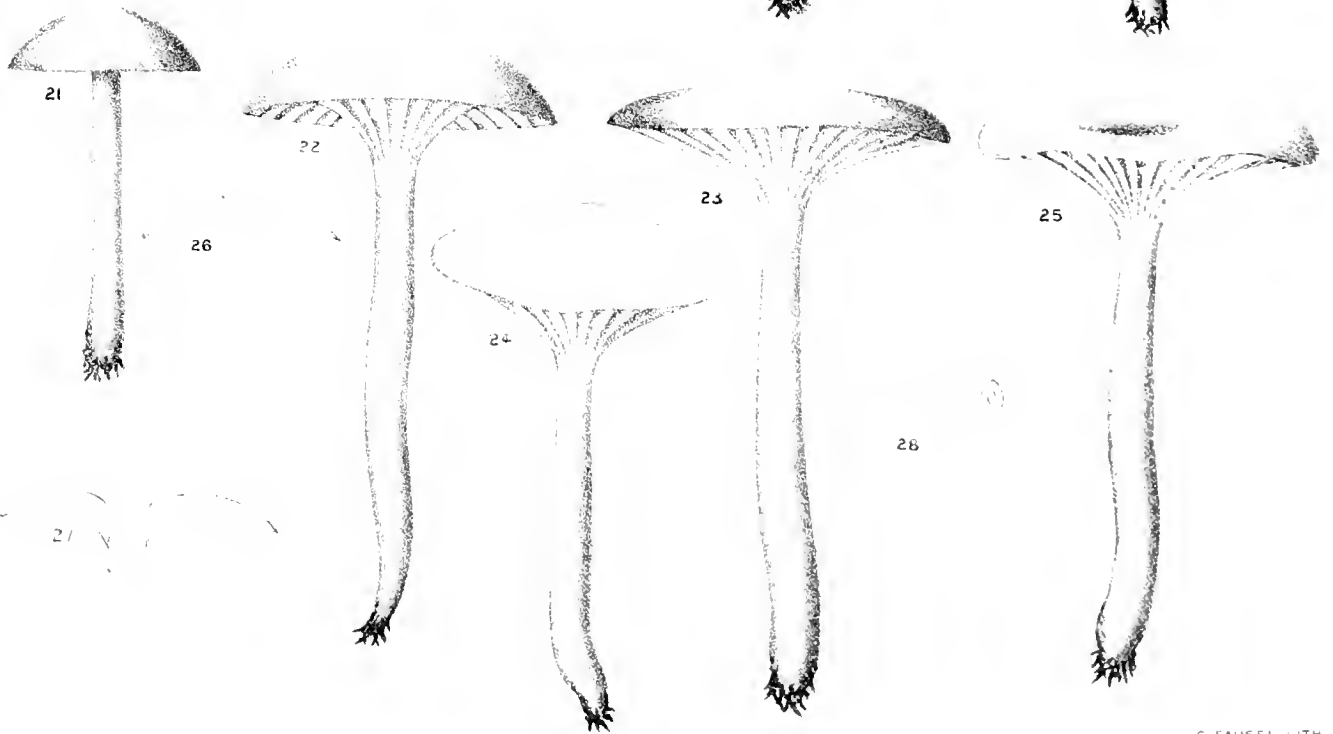
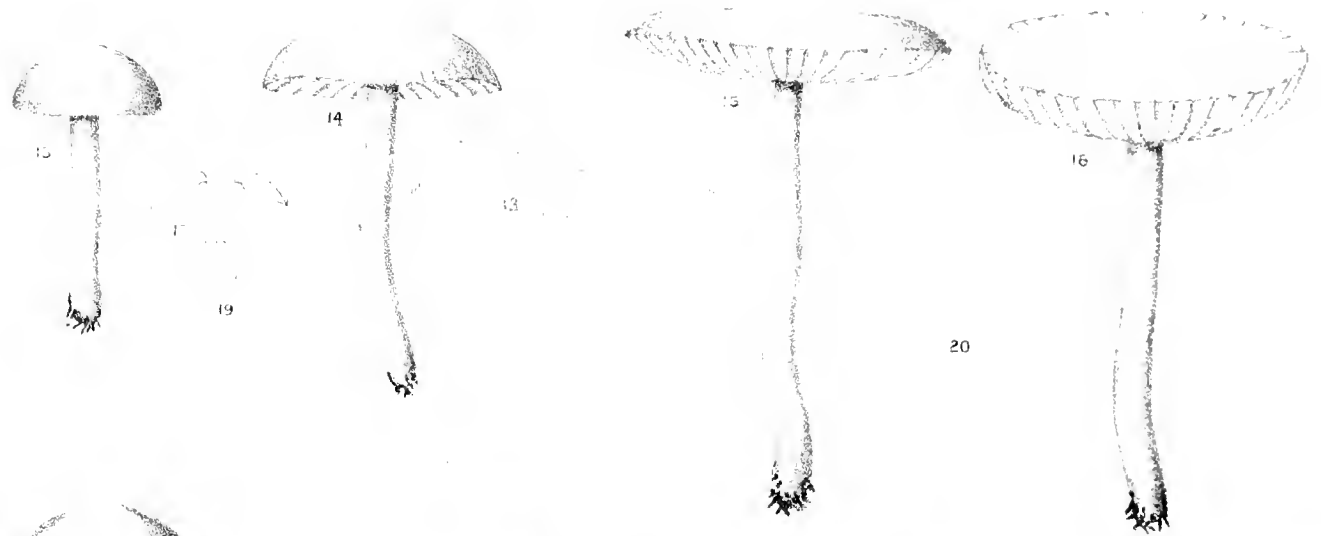
- 13-15 Three plants of different degrees of development
- 16 Mature plant with margin of cap curved upward
- 17 Vertical section of the upper part of a young plant
- 18 Vertical section of the upper part of a mature plant
- 19 Transverse section of a stem
- 20 Four spores  $\times 400$

**Hygrophorus speciosus** *Pk.*

## SHOWY HYGROPHORUS

- 21, 22 Two plants of different size
- 23, 24 Two mature plants with caps umbonate
- 25 Mature plant with cap wholly yellow
- 26, 27 Vertical sections of the upper parts of two plants
- 28 Four spores  $\times 400$





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FIG. 1-12 **HYGROPHORUS LARICINUS** PK  
LARCH HYGROPHORUS

FIG. 13-20 **HYGROPHORUS CHLOROPHANUS** FR.  
SULFURY HYGROPHORUS

FIG. 21-28 **HYGROPHORUS SPECIOSUS** PK  
SHOWY HYGROPHORUS

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PLATE 52

**Hygrophorus puniceus** *Fr.*

## RED HYGROPHORUS

- FIGURE
- 1 Young plant
  - 2, 3 Two mature plants, one showing the gills
  - 4 Vertical section of the upper part of a young plant
  - 5 Vertical section of the upper part of a mature plant
  - 6 Transverse section of a stem
  - 7 Four spores  $\times 400$

**Hygrophorus virgineus** (*Wulf.*) *Fr.*

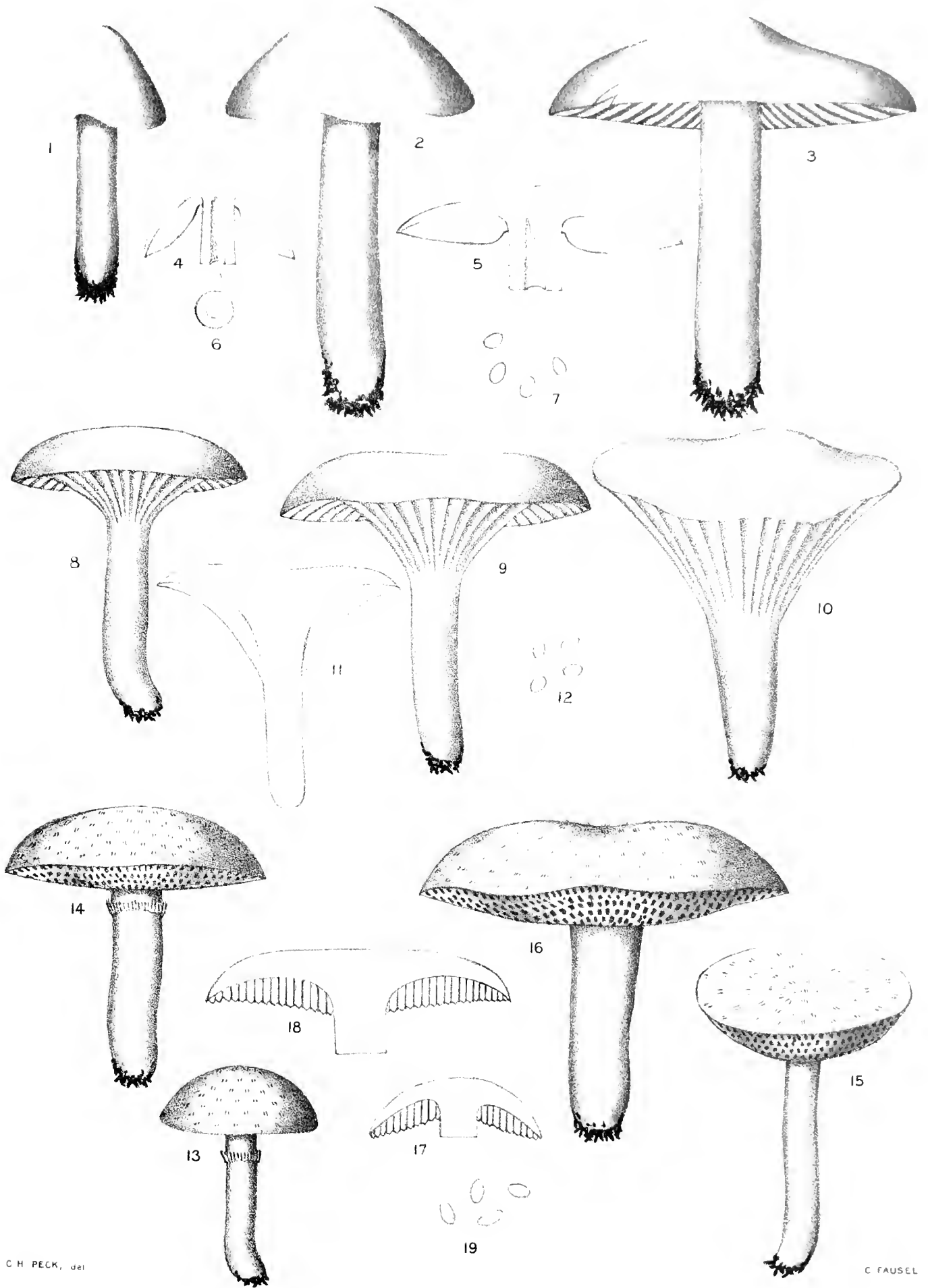
## WHITE HYGROPHORUS

- 8-10 Three plants showing three forms of cap
- 11 Vertical section of a cap
- 12 Four spores  $\times 400$

**Boletinus grisellus** *W.*

## GRAYISH BOLETINUS

- 13 Young plant
- 14 Immature plant
- 15, 16 Mature plants, one small but with cap fully expanded
- 17 Vertical section of the upper part of an immature plant
- 18 Vertical section of the upper part of a mature plant
- 19 Four spores  $\times 400$



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FIG. 1 TO 7 *HYGROPHORUS PUNICEUS* FR.  
RED *HYGROPHORUS*

FIG. 8 TO 12 *HYGROPHORUS VIRGINEUS* FR.  
WHITE *HYGROPHORUS*

FIG. 13 TO 19 *BOLETINUS GRISELLUS* PK.  
GRAYISH *BOLETINUS*



PLATE 53

**Lactarius chelidonium** *Pk.*

## CELANDINE LACTARIUS

FIGURE

- 1 Young plant with marginal zones on the cap
- 2 Mature plant with marginal zones on the cap
- 3 Mature plant without marginal zones
- 4 Old plant with cap fully expanded
- 5 Vertical section of a plant
- 6 Four spores  $\times 400$

**Lactarius distans** *Pk.*

## DISTANT GILLED LACTARIUS

- 7 Young plant
- 8 Mature plant with convex cap
- 9 Mature plant with cap fully expanded
- 10 Vertical section of a plant
- 11 Four spores  $\times 400$

**Lactarius gerardii** *Pk.*

## GERARD'S LACTARIUS

- 12 Young plant
- 13 Mature plant with convex cap
- 14 Mature plant with cap fully expanded
- 15 Vertical section of a plant
- 16 Four spores  $\times 400$





FIG. 1 TO 6 **LACTARIUS CHELIDGNIUM** PK.  
CELANDINE LACTARIUS

FIG. 7 TO 11 **LACTARIUS DISTANS** PK.  
DISTANT GILLED LACTARIUS

FIG. 12 TO 16 **LACTARIUS GERARDII** PK.  
GERARD'S LACTARIUS



PLATE 54

**Russula roseipes** (*Secr.*) *Bres.*

## ROSY STEMMED RUSSULA

FIGURE

- 1 Young plant
- 2, 3 Two plants with caps partly expanded
- 4 Mature plant with cap fully expanded
- 5, 6 Vertical sections of the upper parts of two plants
- 7 Four spores  $\times 400$

**Russula ochrophylla** *Pk.*

## OCHERY GILLED RUSSULA

- 8 Young plant
- 9, 10 Two mature plants
- 11 Vertical section of the upper part of a plant

var. **albipes** *Pk.*

- 12, 13 Two plants having the stem white and the cap paler
- 14 Four spores  $\times 400$



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FIG. 1-7 **RUSSULA ROSEIPES** BRES.  
ROSY STEMMED RUSSULA

FIG. 8-14 **RUSSULA OCHROPHYLLA** PK  
OCHERY GILLED RUSSULA



PLATE 55

**Cantharellus cinnabarinus** *Schw.*

## CINNABAR CHANTARELLE

FIGURE

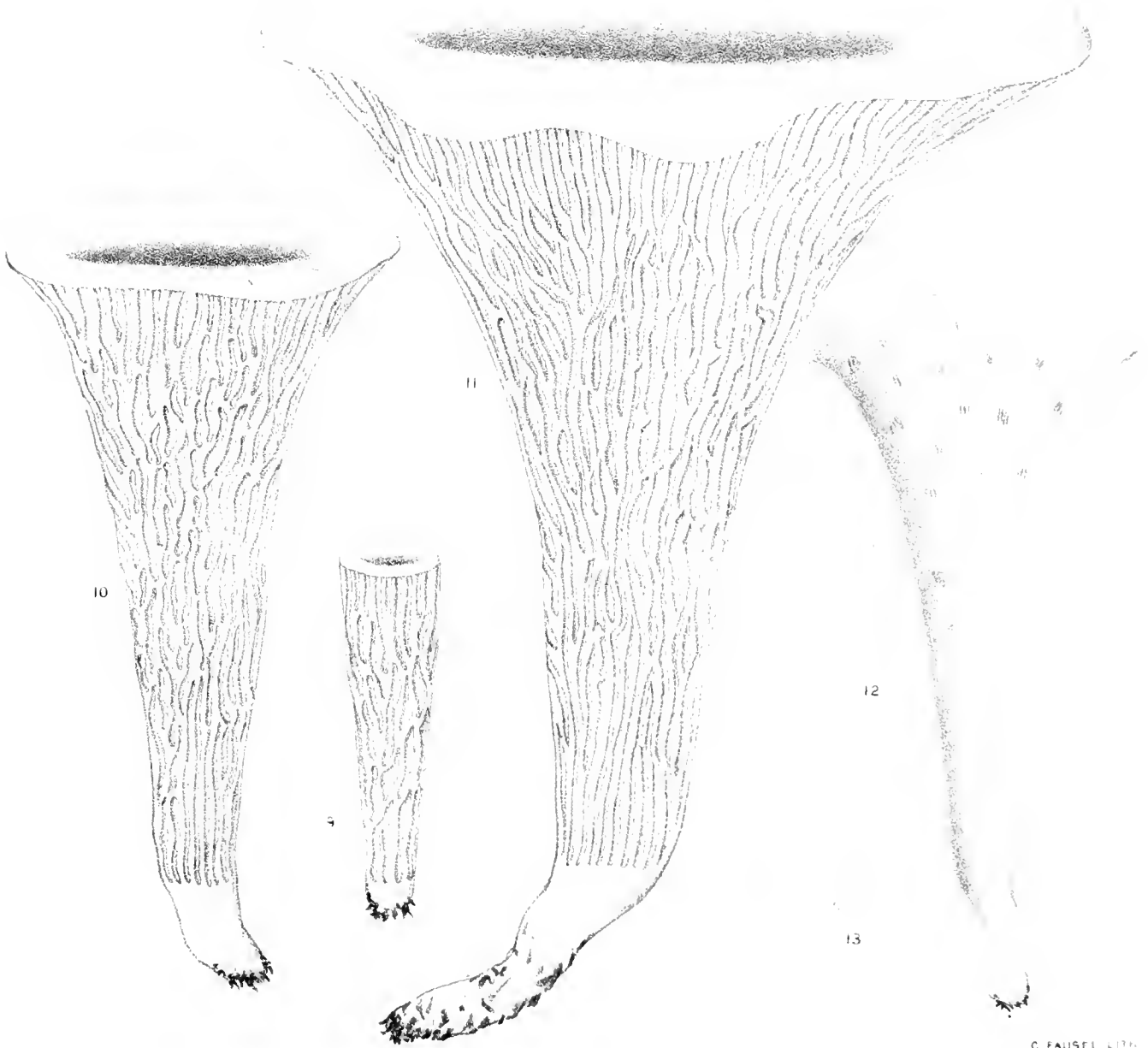
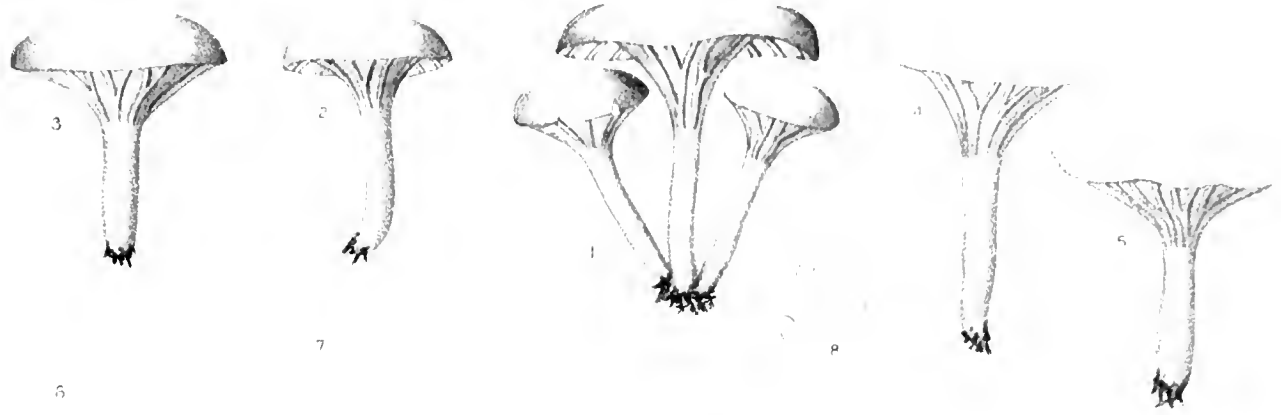
- 1 Cluster of three plants
- 2, 3 Two plants with caps partly expanded
- 4, 5 Two plants with caps fully expanded and slightly faded
- 6, 7 Vertical sections of two plants, one irregular
- 8 Four spores  $\times 400$

**Cantharellus floccosus** *Schw.*

## FLOCCOSE CHANTARELLE

- 9 Young plant
- 10, 11 Two mature plants unequal in size
- 12 Vertical section of a small plant
- 13 Four spores  $\times 400$





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C. FAUSEL, lith.

FIG. 1-8 *CANTHARELLUS CINNABARINUS* SCHW  
CINNABAR CHANTARELLE

FIG. 9-13 *CANTHARELLUS FLOCCOSUS* SCHW  
FLOCCOSE CHANTARELLE



PLATE 56

**Cantharellus lutescens** *Fr.*

## YELLOWISH CHANTARELLE

FIGURE

- 1 Cluster of three young moist plants
- 2, 3 Two mature plants with caps paler from loss of moisture
- 4, 5 Two plants paler in color
- 6 Vertical section of the upper part of a plant
- 7 Transverse section of a stem
- 8 Four spores  $\times$  400

**Cantharellus infundibuliformis** (*Scop.*) *Fr.*

## FUNNEL FORM CHANTARELLE

- 9 Young moist plant
- 10, 11 Two mature moist plants
- 12, 13 Two mature plants with caps paler from loss of moisture
- 14 Vertical section of the upper part of a plant
- 15 Transverse section of a stem
- 16 Four spores  $\times$  400

**Craterellus cantharellus** (*Schw.*) *Fr.*

## CHANTARELLE CRATERELLUS

- 17 Cluster of four plants
- 18 Small plant
- 19 Plant with the cap split on the margin and depressed in the center
- 20 Vertical section of a plant
- 21 Four spores  $\times$  400

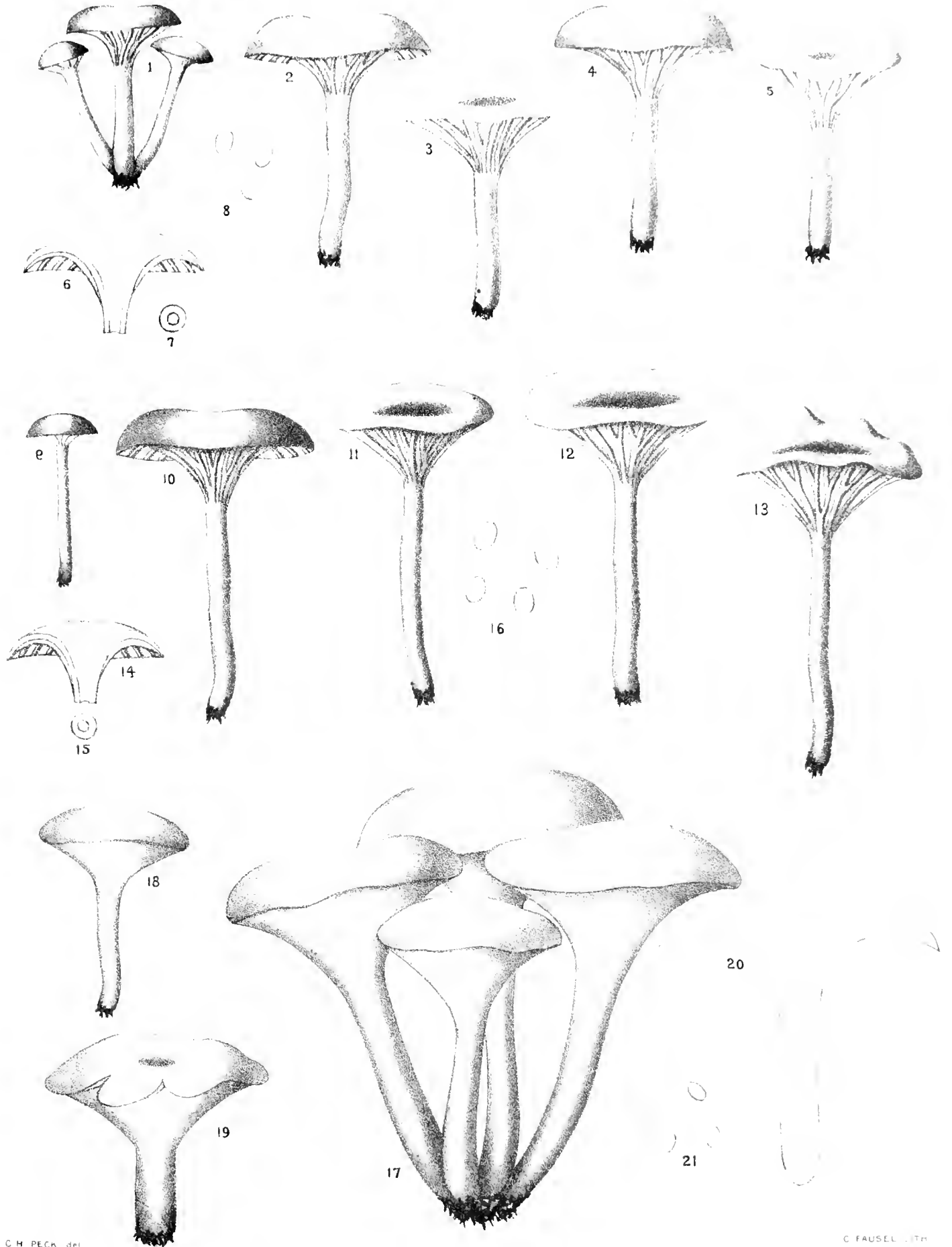


FIG. 1 TO 8 *CANTHARELLUS LUTESCENS* FR.  
YELLOWISH CHANTARELLE

FIG. 9 TO 16 *CANTHARELLUS INFUNDIBULIFORMIS* (SCOP.) FR.  
FUNNELFORM CHANTARELLE

FIG. 17 TO 21 *CRATERELLUS CANTHARELLUS* SCHW.  
CHANTARELLE CRATERELLUS

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PLATE 57

**Pholiota praecox** (*Pers.*) *Fr.*

## EARLY PHOLIOTA

FIGURE

- 1 Immature plant
- 2 Mature plant
- 3 Vertical section of the upper part of an immature plant
- 4 Vertical section of the upper part of a mature plant
- 5 Transverse section of a stem

var. **minor** *Batt.*

- 6, 7 Immature plants
- 8 Mature plant

var. **sylvestris** *Pk.*

- 9 Immature plant
- 10 Mature plant
- 11 Four spores  $\times 400$

**Pholiota adiposa** *Fr.*

## FAT PHOLIOTA

- 12 Cluster of three plants
- 13 Single immature plant
- 14 Single mature plant
- 15 Vertical section of the upper part of an immature plant
- 16 Vertical section of the upper part of a mature plant
- 17 Four spores  $\times 400$



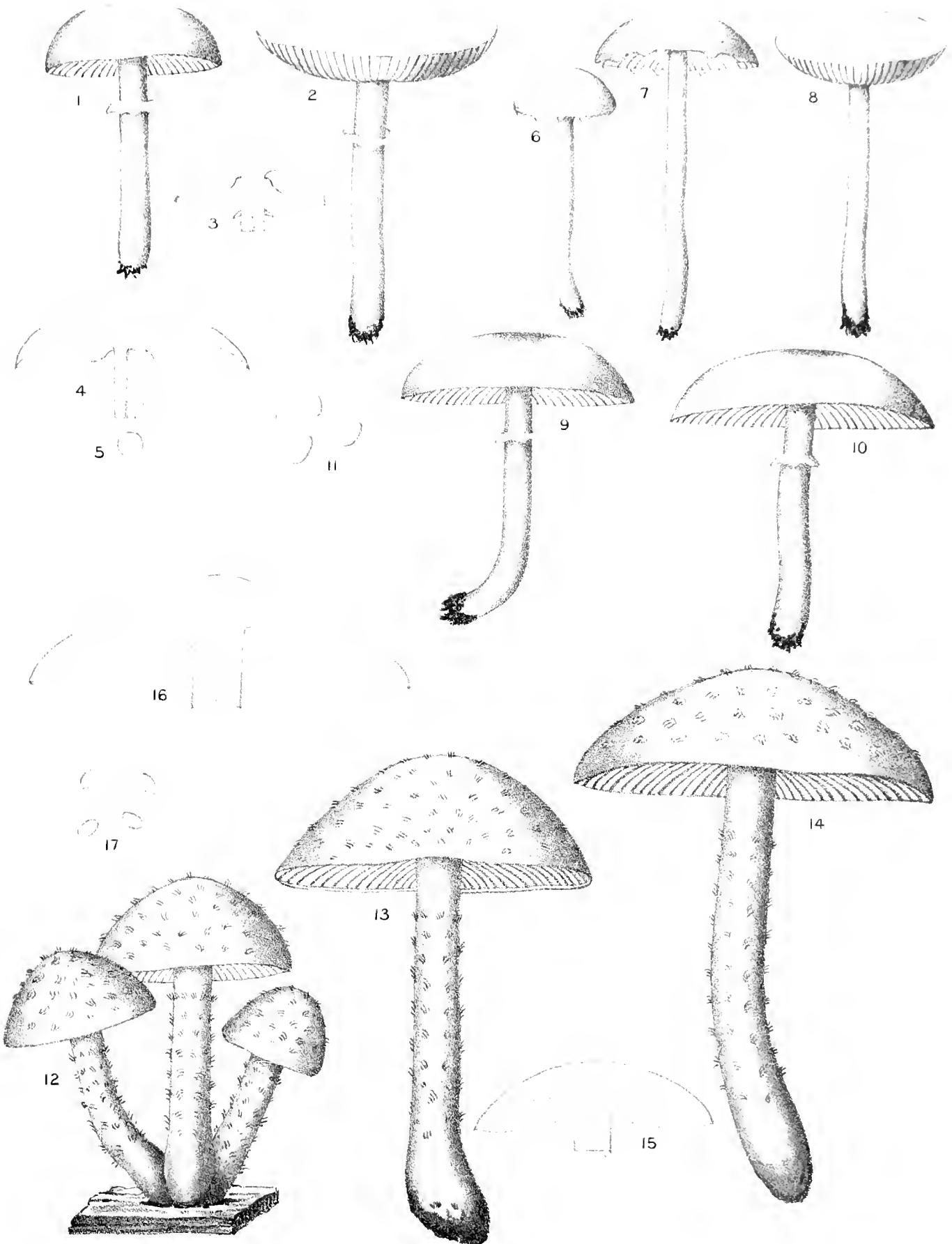


FIG. 1 TO 11 PHOLIOTA PRAECOX (PERS.) FR  
EARLY PHOLIOTA

FIG. 12 TO 17 PHOLIOTA ADIPOSA FR  
FAT PHOLIOTA



PLATE 58

*Cortinarius evernius* Fr.

## WELL-GROWN CORTINARIUS

FIGURE

- 1 Young plant
- 2 Mature moist plant
- 3 Mature plant with cap pale from loss of moisture
- 4 Vertical section of the upper part of a young plant
- 5 Vertical section of the upper part of a mature plant
- 6 Transverse section of a stem
- 7 Four spores  $\times 400$

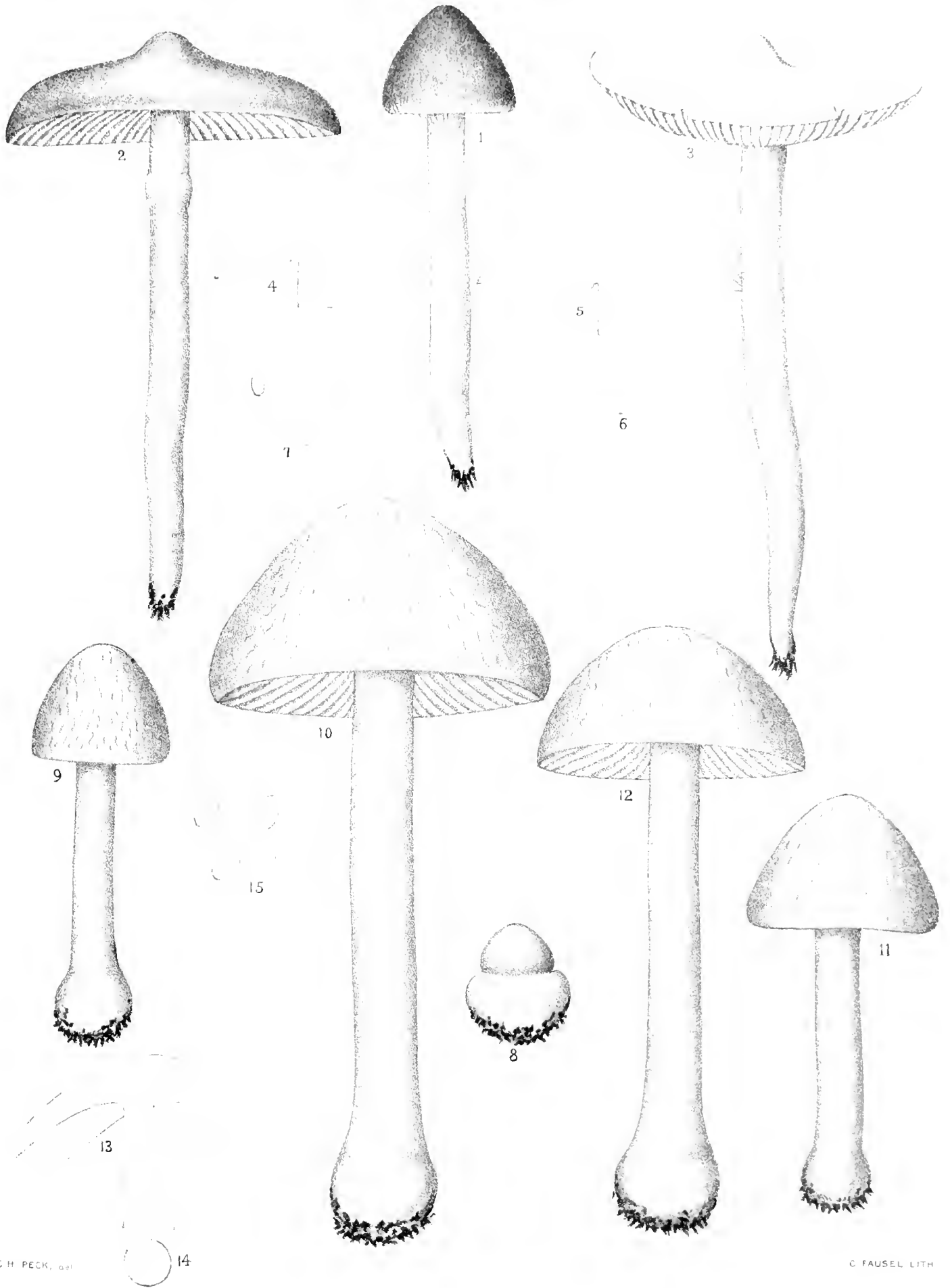
*Cortinarius corrugatus* Pk.

## CORRUGATED CORTINARIUS

- 8 Very young plant, showing cap and bulb of stem
- 9 Young plant after elongation of stem
- 10 Mature plant

var. *subsquamosus*

- 11, 12 Two immature plants
- 13 Vertical section of the upper part of a mature plant
- 14 Transverse section of a stem
- 15 Four spores  $\times 400$



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FIG. 1-7 **CORTINARIUS EVERNIUS** FR.  
WELL-GROWN CORTINARIUS

FIG. 8-15 **CORTINARIUS CORRUGATUS** FR.  
CORRUGATED CORTINARIUS



PLATE 59

**Agaricus silvicola Vitt.**

## FOREST MUSHROOM

## FIGURE

- 1 Young plant
- 2 Immature plant
- 3 Mature plant
- 4 Vertical section of the upper part of an immature plant
- 5 Vertical section of the upper part of a mature plant
- 6 Transverse section of a stem
- 7 Four spores  $\times 400$

**Agaricus abruptus Pk.**

## ABRUPT MUSHROOM

- 8 Young plant
- 9 Immature plant
- 10 Mature plant with cap fully expanded
- 11 Vertical section of the upper part of an immature plant
- 12 Vertical section of the upper part of a mature plant
- 13 Transverse section of a stem
- 14 Four spores  $\times 400$





FIG. 1 TO 7 *AGARICUS SILVICOLA* VITT.  
FOREST MUSHROOM

FIG. 8 TO 14 *AGARICUS ABRUPTUS* PK  
ABRUPT MUSHROOM



PLATE 6c

**Hypholoma incertum** *Pk.*

## UNCERTAIN HYPHOLOMA

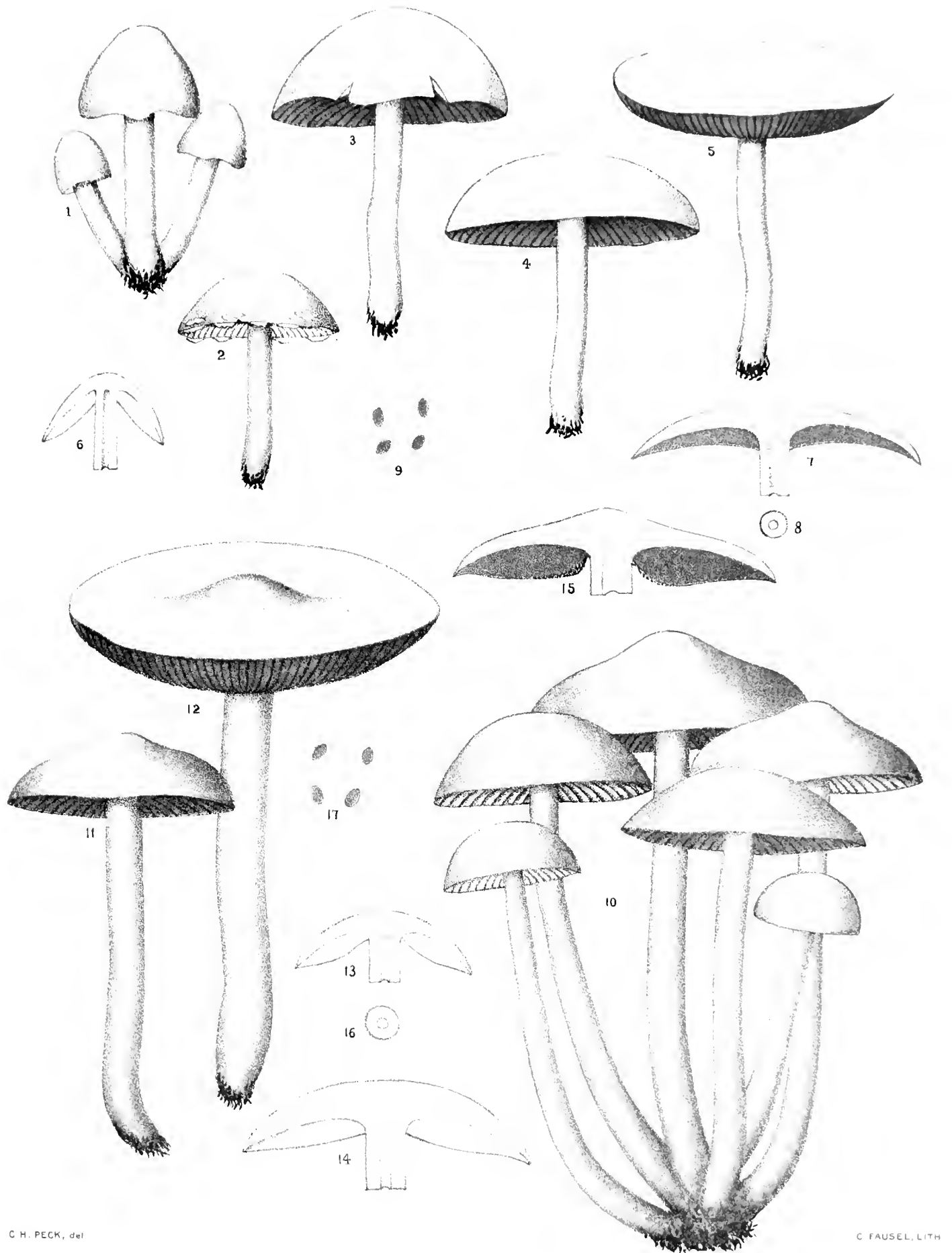
FIGURE

- 1 Cluster of three young plants
- 2 Immature plant, showing fragments of the veil on margin of cap
- 3-5 Three mature plants
- 6 Vertical section of the upper part of an immature plant
- 7 Vertical section of the upper part of a mature plant
- 8 Transverse section of a stem
- 9 Four spores  $\times 400$

**Hypholoma perplexum** *Pk.*

## PERPLEXING HYPHOLOMA

- 10 Cluster of six plants
- 11, 12 Two mature plants, one with cap fully expanded
- 13-15 Vertical sections of the upper parts of three plants, showing variation in color of the gills according to age
- 16 Transverse section of a stem
- 17 Four spores  $\times 400$



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FIG. 1 TO 9 *HYPHOLOMA INCERTUM* PK.  
UNCERTAIN *HYPHOLOMA*

FIG. 10 TO 17 *HYPHOLOMA PERPLEXUM* PK.  
PERPLEXING *HYPHOLOMA*

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PLATE 61

**Boletinus pictus** *Pk.*

## PAINTED BOLETINUS

FIGURE

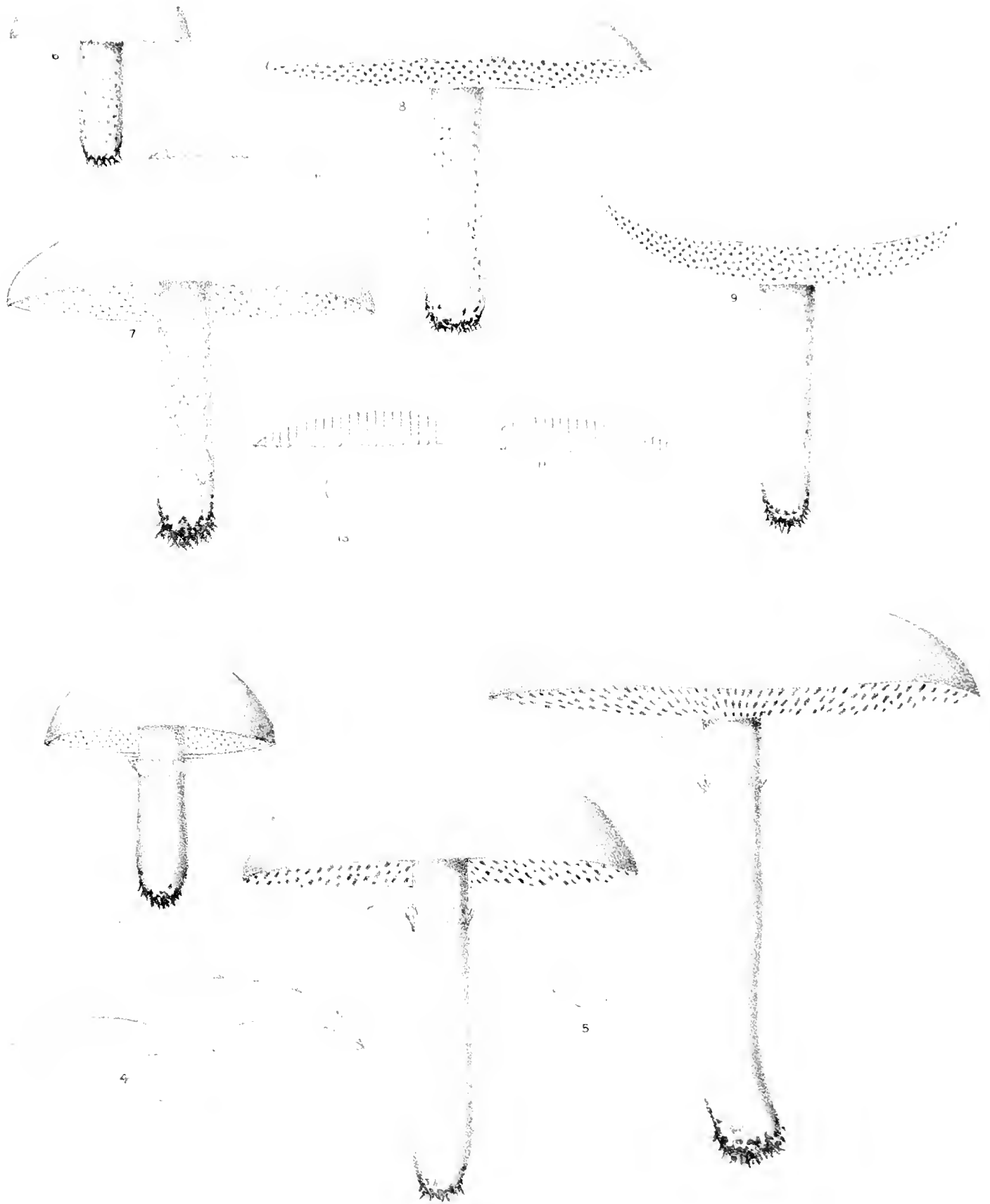
- 1 Young plant
- 2, 3 Two mature plants
- 4 Vertical section of the upper part of a mature plant
- 5 Four spores  $\times 400$

**Boletus subaureus** *Pk.*

## PALE GOLDEN BOLETUS

- 6 Young plant
- 7 Immature plant
- 8 Mature plant
- 9 Mature plant with cap fully expanded and spotted by the drying of the gluten
- 10 Vertical section of the upper part of a young plant
- 11, 12 Vertical sections of the upper parts of two mature plants, one with margin of cap curved upward
- 13 Four spores  $\times 400$





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FIG. 1-5 *BOLETINUS PICTUS* PK.  
PAINTED BOLETINUS

FIG. 6-13 *BOLETUS SUBAUREUS* PK.  
PALE GOLDEN BOLETUS

PLATE 61 ON STATE CENTER



PLATE 62

***Boletus spectabilis* /k.**

## SHOWY BOLETUS

FIGURE

- 1 Young plant
- 2 Immature plant
- 3 Mature plant
- 4 Plant with margin of cap yellow
- 5 Plant with cap wholly yellow
- 6 Vertical section of the upper part of a plant
- 7 Four spores  $\times 400$



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**BOLETUS SPECTABILIS** PK.  
SHOWY BOLETUS



PLATE 63

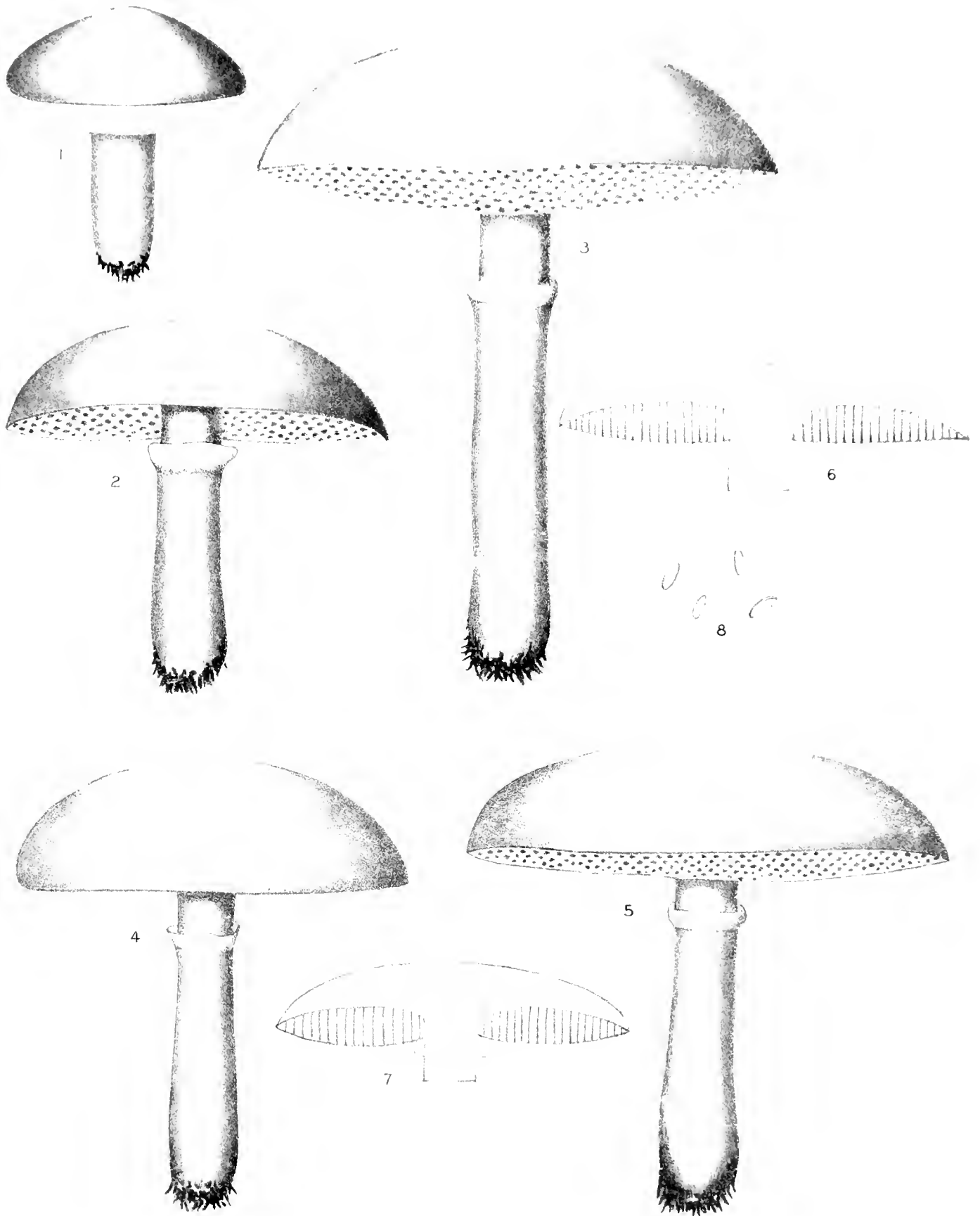
***Boletus clintonianus* Pk.**

## CLINTON'S BOLETUS

FIGURE

- 1 Young plant
- 2 Immature plant
- 3 Mature plant
- 4 Mature plant with reddish yellow cap
- 5 Mature plant with yellow cap
- 6, 7 Vertical sections of the upper parts of two plants
- 8 Four spores  $\times 400$





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*BOLETUS CLINTONIANUS* PK.  
CLINTON'S BOLETUS



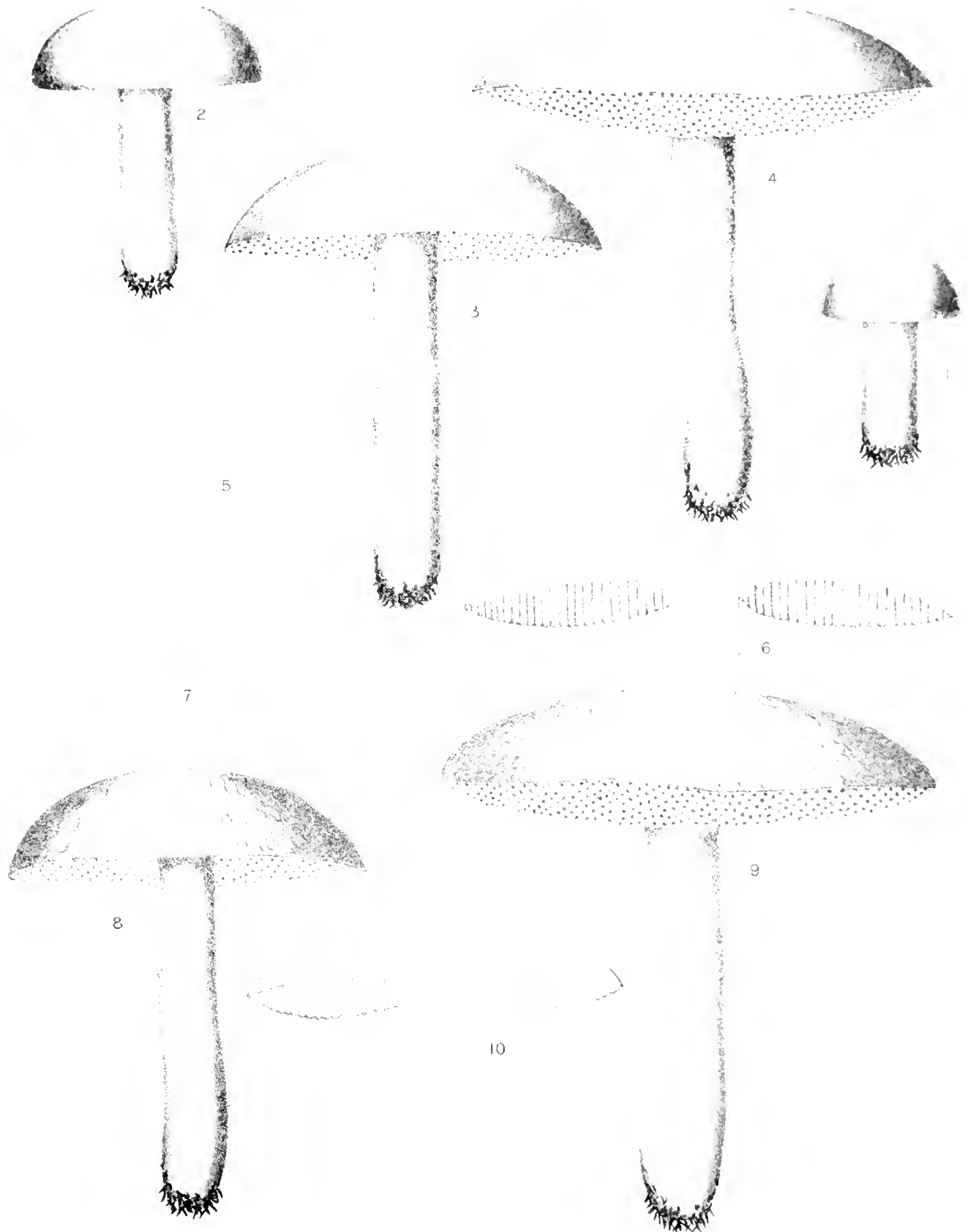
PLATE 64

**Boletus subglabripes** *Pk.*

## SMOOTH-STEMMED BOLETUS

FIGURE

- 1, 2 Two young plants
  - 3 Immature plant
  - 4 Mature plant with stem reddish toward the base
  - 5 Vertical section of the upper part of an immature plant
  - 6 Vertical section of the upper part of a mature plant
  - 7 Four spores  $\times 400$
- var. corrugis* *Pk.*
- 8 Immature plant
  - 9 Mature plant with stem reddish toward the base
  - 10 Vertical section of the upper part of a plant



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**BOLETUS SUBGLABRIPES** Peck  
SMOOTHISH STEMMED BOLETUS



PLATE 65

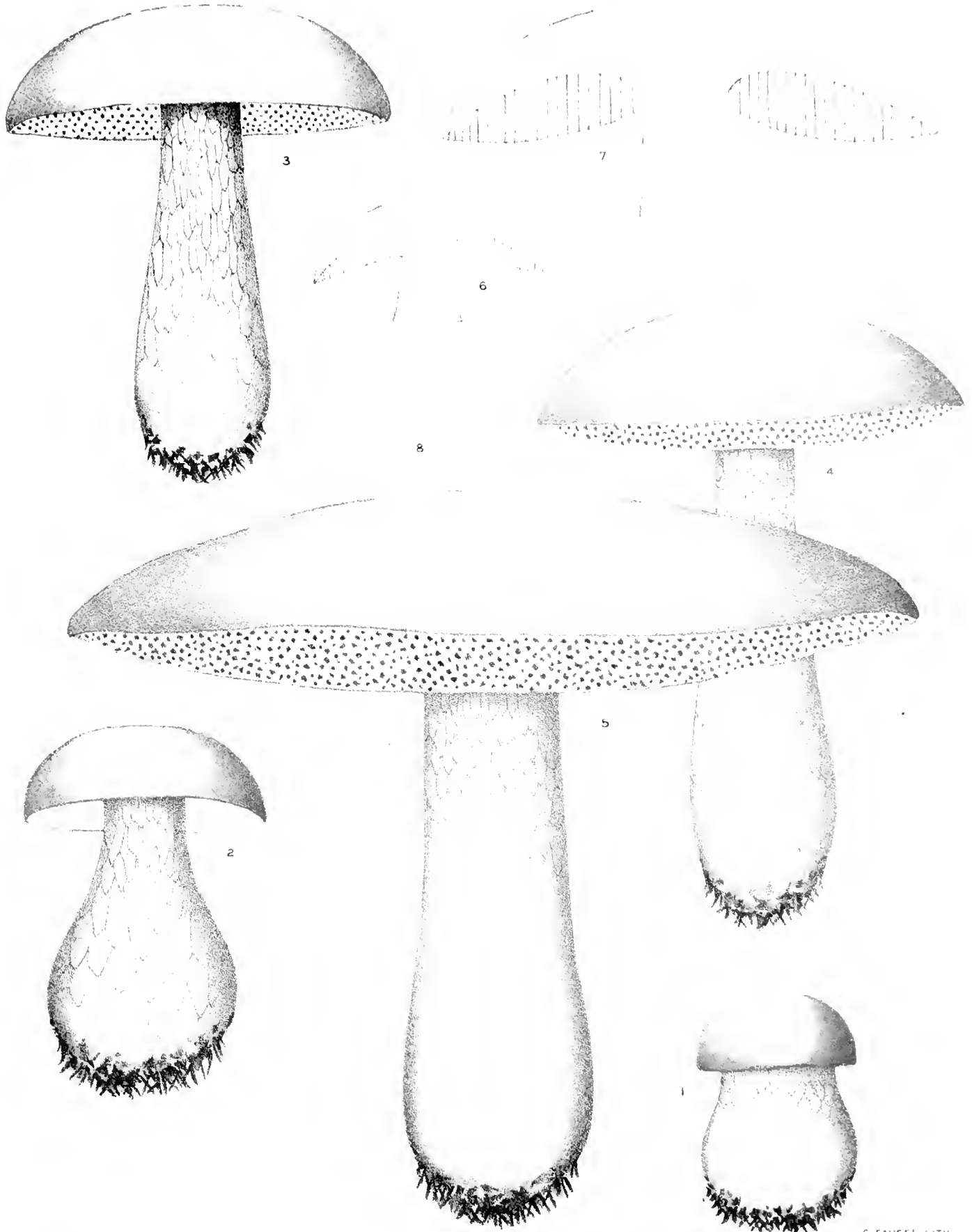
**Boletus edulis clavipes** *Pk.*

## CLUB STEMMED BOLETUS

FIGURE

- 1, 2 Two young plants, one showing the lower surface of the cap
- 3 Immature plant
- 4 Mature plant of small size
- 5 Mature plant of large size with stem reticulated at the top only
- 6 Vertical section of the upper part of a young plant
- 7 Vertical section of the upper part of a mature plant
- 8 Four spores  $\times 400$





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**BOLETUS EDULIS CLAVIPES** PK  
CLUB STEMMED BOLETUS



PLATE 66

**Boletus brevipes** *Pk.*

## SHORT STEMMED BOLETUS

FIGURE

- 1 Young plant
- 2 Immature plant
- 3 Mature plant with cap fully expanded
- 4 Vertical section of the upper part of an immature plant
- 5 Vertical section of the upper part of a mature plant
- 6 Four spores  $\times 400$

**Boletus affinis** *Pk.*

## RELATED BOLETUS

- 7 Young plant with stuffed tubes
- 8 Immature plant
- 9 Mature plant with cap fully expanded
- 10 Vertical section of the upper part of a young plant
- 11 Vertical section of the upper part of a mature plant

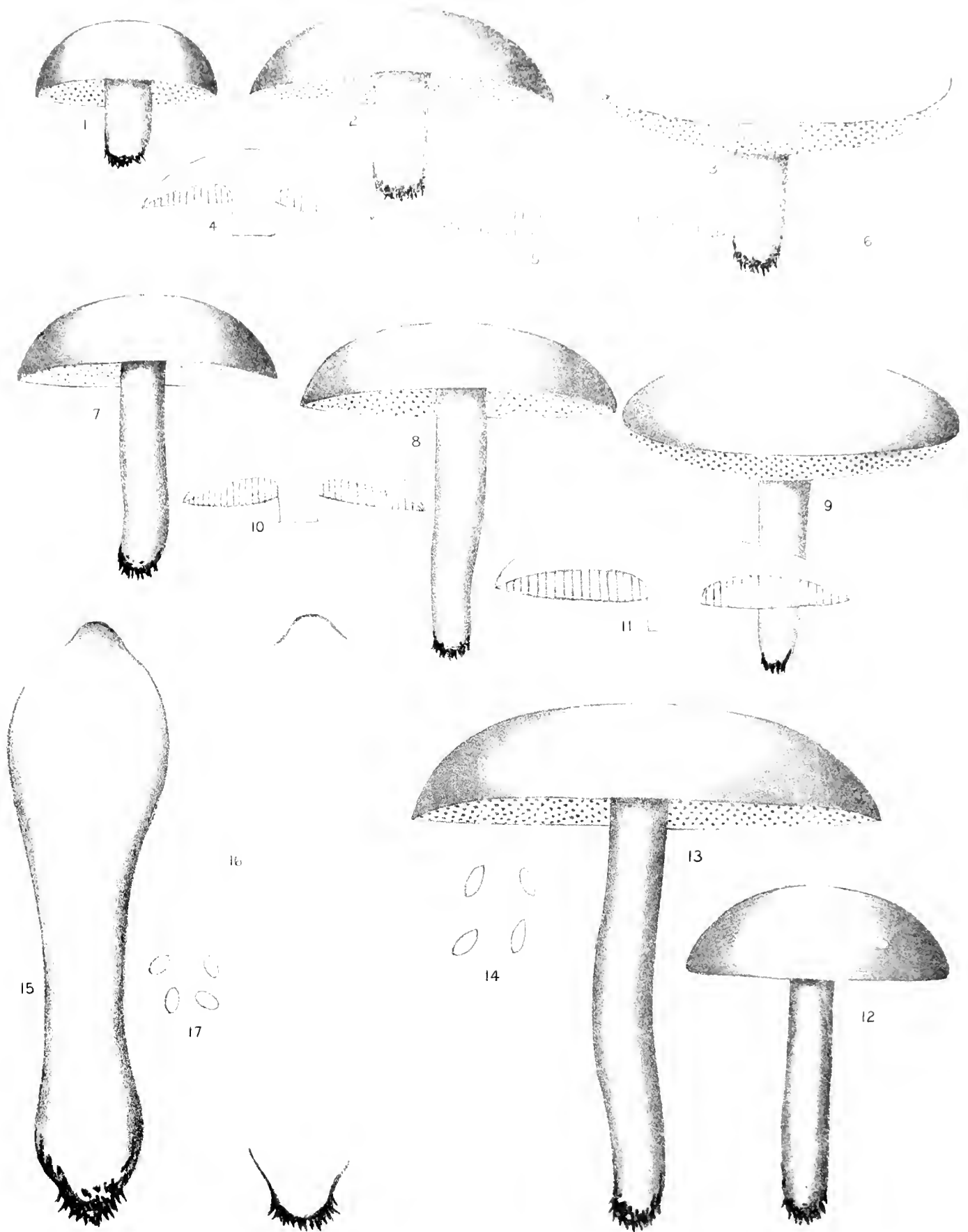
var. **maculosus** *Pk.*

- 12 Immature plant
- 13 Mature plant with convex cap
- 14 Four spores  $\times 400$

**Clavaria pistillaris umbonata** *Pk.*

## UMBONATE CLAVARIA

- 15 Mature plant
- 16 Vertical section of a plant
- 17 Four spores  $\times 400$



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FIG. 1-6 **BOLETUS BREVIPES** PK.  
SHORT STEMMED BOLETUS

FIG. 7-14 **BOLETUS AFFINIS** PK.  
RELATED BOLETUS

FIG. 15-17 **CLAVARIA PISTILLARIS UMBONATA** PK.  
UMBONATE CLAVARIA



PLATE 67

**Hydnum albidum** Fr.

## WHITE HYDNUM

FIGURE

- 1 Group of four plants
- 2 Plant of medium size
- 3 Plant having the cap wavy on the margin
- 4 Plant having the stem eccentric
- 5, 6 Vertical sections of the upper parts of two plants, one with the stem eccentric
- 7 Four spores  $\times 400$

**Hydnum caput-ursi** Fr.

## BEAR'S HEAD HYDNUM

- 8 Small plant of vertical growth
- 9 Plant of lateral growth
- 10 Vertical section of a plant of upright growth
- 11 Vertical section of a plant of lateral growth, showing both upward and downward development
- 12 Four spores  $\times 400$





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FIG. 1-7 **HYDNIUM ALBIDUM** PK.  
**WHITE HYDNUM**

FIG. 8-12 **HYDNIUM CAPUT-URSI** FR.  
**BEAR'S-HEAD HYDNUM**

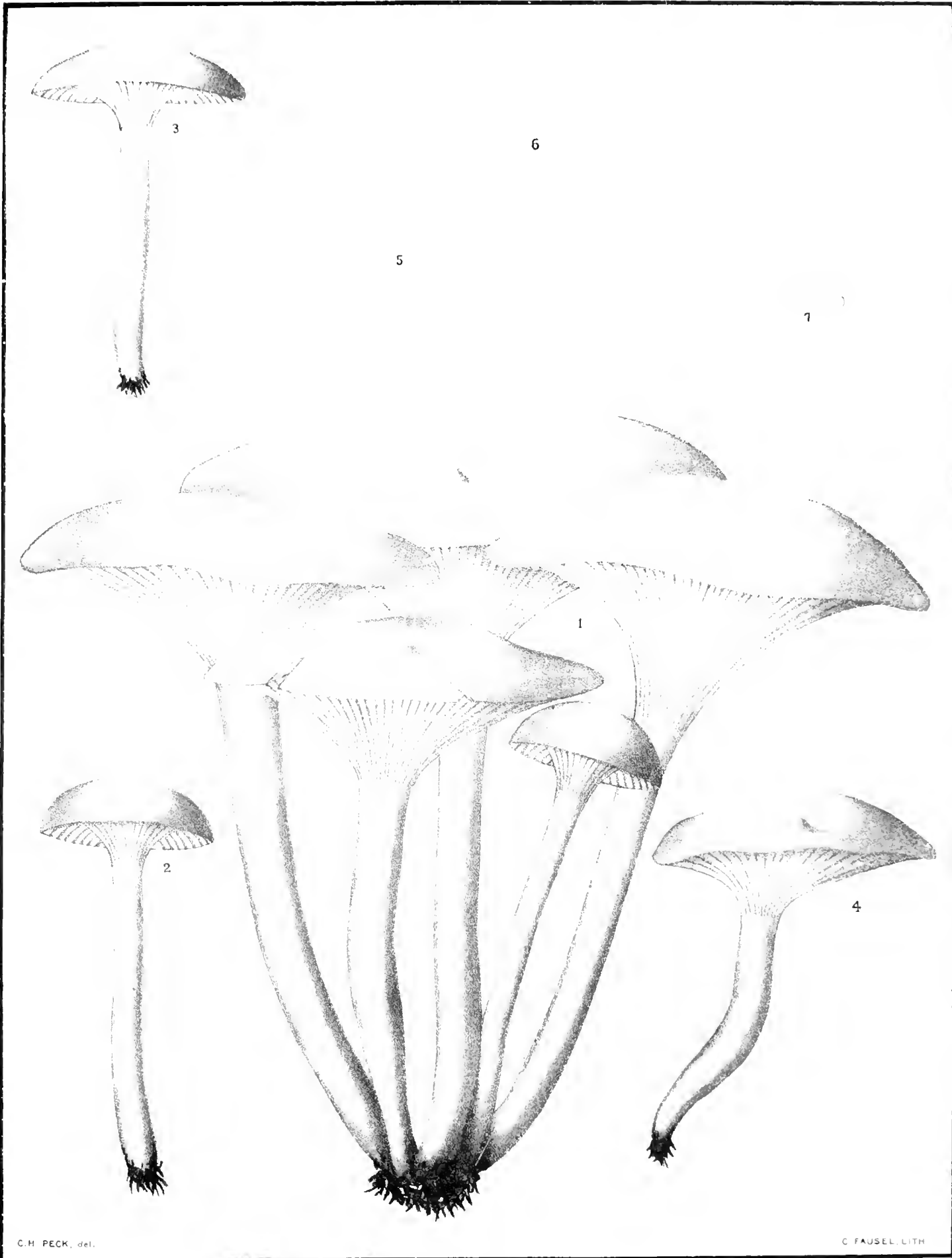


PLATE 68

**Clitocybe illudens** Schwe.

## DECEIVING CLITOCYBE

- FIGURE
- 1 Cluster of five plants, two of them having an umbonate cap
  - 2, 3 Small plants of regular form
  - 4 Irregular plant with umbonate cap
  - 5 Vertical section of the upper part of a small plant
  - 6 Vertical section of the upper part of a large plant
  - 7 Four spores  $\times 400$



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CLITOCYBE ILLUDENS Schw.  
DECEIVING CLITOCYBE



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