Mushrooms

COMMON MUSHROOMS

BY

LEON L. PRAY

FIELD MUSEUM OF NATURAL HISTORY

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RECTOR

It is the purpose of this leaflet to illustrate and to describe briefly a number of the most common and conspicuous mushrooms. The illustrations are from photographs by Dr. Edward T. Harper and Susan A. Harper, whose extensive collections were bequeathed to Field Museum of Natural History. These photographs give a good idea of the superficial characters of the mushrooms described by Mr. Pray, who also made the line drawings. Acknowledgments are made to Professor E. M. Gilbert, of the University of Wisconsin, for helpful suggestions and comments on the manuscript.

Those interested in mushrooms as a food should observe the precautions recommended by Mr. Pray. The subject of edible and poisonous fungi is one in which a little knowledge may be dangerous, but it is believed that the information presented here is sufficient to enable a careful observer to distinguish many of the most important species. Further information on the subject is available in various more extensive non-technical works listed on the last page of this leaflet.

B. E. Dahlgren
Curator, Department of Botany

MICA-CAP MUSHROOMS

FIELD MUSEUM OF NATURAL HISTORY
DEPARTMENT OF BOTANY
CHICAGO, 1936

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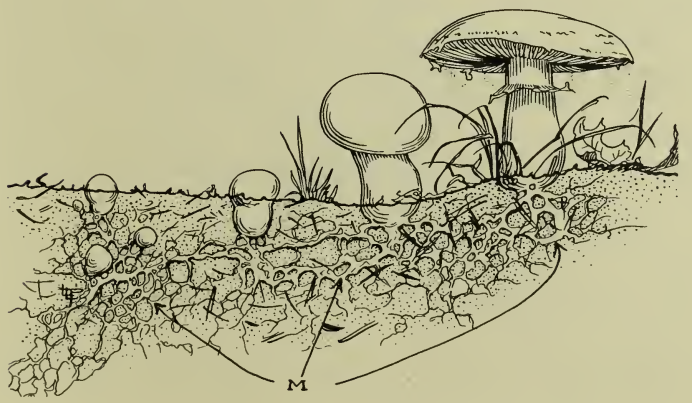
COMMON MUSHROOMS

All of the mushrooms here discussed are spore-bearing organs of fungi that live on dead vegetable matter.

A mushroom is but a part of a fungus plant, which for the rest is composed of a mass of colorless cellular strands that extend and crisscross through the soil or other matter on which the fungus grows. This vegetative, usually unseen part of the fungus, is called the *mycelium.* Fungi grow ordinarily on dead organic matter and their life processes generally assist in hastening decay. Certain fungi, such as smuts and rusts and some higher gilled mushrooms, e.g. *Armillaria mellea,* grow on living plants, drawing directly upon the tissues and juices of their hosts. A few fungi attack living animal tissue, causing



common warts and ringworm as well as certain other affections of man and animals.

When a fungus organism is ready to reproduce its kind there are formed upon the mycelium little knobs of tissue which grow and push out rapidly into the open air, becoming the well-known spore-bearing bodies known as mushrooms.

The mushroom might thus be regarded as the "seed pod" of a fungus plant, for, while spores are botanically very different from seeds, they serve the same purpose for the fungus. Spores are formed upon the sides of the gills of Agarics; on the conical teeth of Hydnums; inside the tubes of Polypores; within the pits of Morels; and on the club tips of Clavarias.

The mushrooms here illustrated are not arranged according to scientific relationship but are classified in two general groups, edible and poisonous. The edible fungi are again arranged approximately according to their time of appearance—those of spring, of the entire growing season, and of autumn.

It is necessary to warn of the danger of eating mushrooms gathered by persons who have little knowledge of these plants, but depend upon so-called "tests" of edibility. There can surely be no doubt about the folly of risking life to experiment with a food that may be poisonous and has only the nutritive value of cucumber, lettuce, or cabbage, when the markets offer commercially grown mushrooms that are perfectly safe.

Without positive knowledge of mushrooms, collecting them for the table is a dangerous pastime. The popular distinction between mushrooms and toadstools is based on fallacy or fancy. Tests supposed to prove a fungus dangerous or safe, such as "caps peeling easily" or "cooking with silver," are useless.

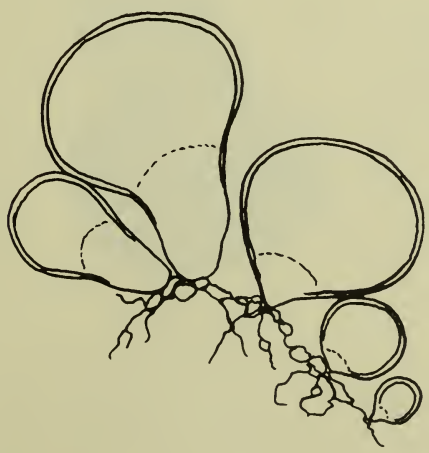
To gather mushrooms for food, it is necessary to familiarize oneself thoroughly with the detailed char-

acters of several kinds commonly found and known to be edible, and then confine one's collecting to those. Only thus is it possible to gather mushrooms for eating with a reasonable degree of safety. All doubtful mushrooms should be considered dangerous.

The poisons of some of the gilled mushrooms are terrible in their manner of dealing death. Poisons formed from aging or decomposed mushrooms of many kinds may prove as deadly.

Mushrooms growing near poisonous Amanitas or near decaying mushrooms should be shunned, for transferred Amanita or decay poison may be as dangerous as its original source. One decaying mushroom or one cap of *Amanita phalloides* in a basket of harmless kinds may render the entire lot unfit for consumption.

LEON L. PRAY



MOREL

(*Morchella esculenta*)

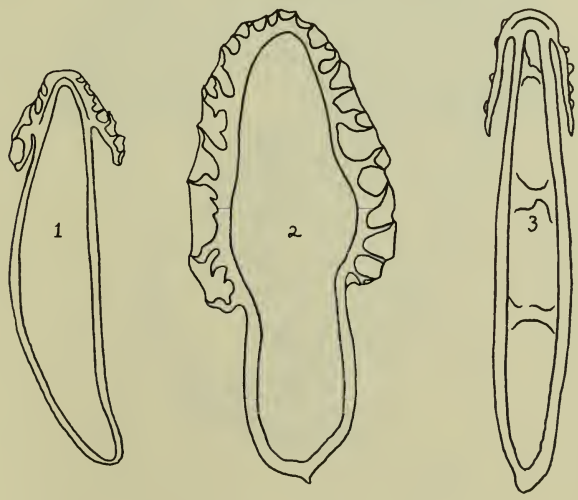
Morels grow in a variety of places—hardwood forests, old orchards, wooded creek bottomlands, and burnt-over woods—from mid-May to early July, if the season has plenty of rain. It takes a keen eye to espy them on the dead leaf carpet because their curious form, suggestive of a worm-eaten leaf, merges with the almost identical

colors of surrounding objects. The irregular, pitted cap is fawn-gray, pale brown, or buff-tinted. The stem is paler or whitish. The spores are white in mass. The whole plant is hollow, with a medium thin "shell." There is no free margin to the cap where it joins the stem, as in the smaller, dusky-capped *Morchella semi-libera.*

There are six recognized species of morels so much alike that a novice scarcely can tell them apart. They have a distinctive odor resembling that of bread fresh from the oven.

All the morels are considered edible, but a mushroom often collected as a morel, *Gyromitra esculenta* has, according to Krieger, N. Y. State Museum Handbook 11, been responsible for 160 deaths.

On using morels for food, one precaution should be observed, viz., to soak the split mushrooms in weak salt water for half a day before cooking. Fresh morels have been known to produce disturbing symptoms, but are not known to have caused death.



1. *M. semi-libera.* 2. *M. deliciosa.* 3. *M. bispora.*

MICA CAP OR GLISTENING COPRINUS

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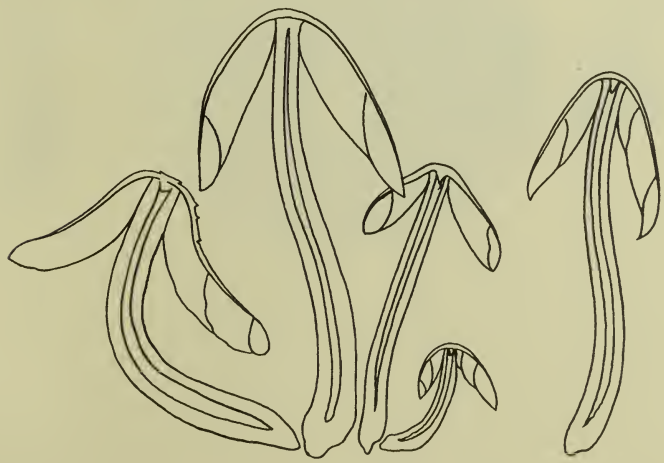
(*Coprinus micaceus*)

This common fungus grows about the base of old trees, on decaying logs and stumps, from April until freezing weather in the fall. Two or three days after a warm rain an abundant crop may be found in woods or city parks, or even along streets shaded by old trees.

The cap is some shade of golden tan, paler toward the margin. Young caps are more or less covered with a fine dusting of mica-like flakes which give the appearance of frost, but this frail decoration disappears as the caps develop.

The gills are at first whitish, turning brown and finally black as the spores ripen. When mature the whole cap dissolves into an inky fluid, except in dry weather. The stem is ivory-whitish and silky-shining. The spores are sepia-black in mass.

The inky-cap mushrooms all have fragile caps that ripen and dissolve soon after maturity till little remains but the white stem, smeared with inky daubs of spore-drippings from the vanished caps. The forenoons of damp summer days are the best time for gathering.



SOLID-STEMMED PANEOLUS

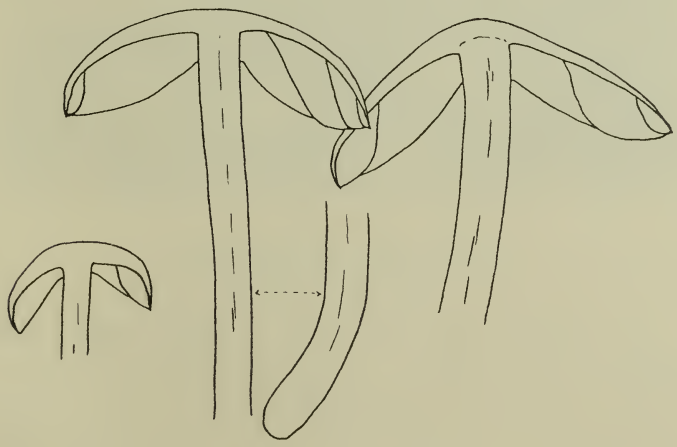
SOLID-STEMMED PANEOLUS

(*Paneolus solidipes*)

The solid-stemmed Paneolus grows on manure heaps or on drying dung in pastures from June to late autumn.

The cap is white, creamy-tinted, or silvery gray. The whiter specimens are apt to be yellowish stained on the center of the cap. The gills are at first whitish, then gray with dusky mottling, and finally inky black. The stem is white, externally glistening, and solid throughout. The spores are jet black in mass.

In a pasture the pale caps of this mushroom may be seen from a distance looking like clusters of golf balls. It attains a fair size—from one to three or more inches in diameter, and is fairly abundant during most of the summer, especially after warm drenching rains. When fresh and perfect this mushroom is of good quality, but it is putrescent, i.e., it decays readily and rapidly, and extreme care should be used to avoid any specimens in which decay has begun at the top of the gills, where it might escape notice. Toxic properties generated in such caps are dangerous.



OYSTER MUSHROOM

(*Pleurotus sapidus*)

The oyster mushroom grows on logs, stumps, and standing dead timber or in wounds on living trees in woods, from June until late fall. Its white caps may be recognized from a distance and one may scan the likely trees and logs within range of vision and locate the oyster

mushroom clusters without the close search necessary to find many other woodland mushrooms.

The cap of this mushroom is white, pale gray, or somewhat yellowish-tinted. The gills are white. The short, excentrically placed stem is white or tinted like the cap. The spores are pale lilac-tinted in mass.

The name "oyster" was probably given them because of the resemblance of their caps to an oyster shell.

The true oyster mushroom is *Pleurotus ostreatus*. The latter is so much like *P. sapidus* that a separate description is unnecessary. The spores of *ostreatus* are pinkish-lilac in mass. The spore colors of both species are so pale that they are listed among the white-spored mushrooms. *P. ostreatus* is usually of broader and heavier growth than *sapidus*, with a somewhat shorter stem.

Both kinds sometimes produce several pounds of caps at a time in successive crops from the same spot all summer long. They are somewhat gristly in texture, but edible.

Only fresh young growths should be gathered for food. They should be examined carefully and all aged and decaying caps or any with dissolving yellow spots should be excluded.

1. *P. ostreatus*. 2. *P. sapidus*. 3. *P. ulmarius*.

SULPHUR POLYPORE

SULPHUR POLYPORE

(*Polyporus sulphureus*)

The sulphur Polypore grows in woods or in the open, upon old logs and stumps and from wounds in living trees, from June to late fall.

Its lobes are rich orange-salmon on their upper surface, with brilliant lemon yellow borders and under surfaces. It is a gorgeous plant whose bright colors might arouse suspicion, but is harmless when fresh. When a young plant is cut, yellow juice oozes from it abundantly.

Apparently the mycelium of this fungus vegetates for a long time before putting forth its caps. Some likely tree stump may stand for years, slowly decaying, without giving evidence of infestation by any of the larger fungi, until suddenly, after a rain late in summer, a cluster of salmon and yellow, thick-fleshed little shelves begins to form on its weathered sides.

After the first rush of growth, this fungus becomes tough and dry and over-run by black beetles that feed upon it.

1. *P. sulphureus.* 2. *P. squamosus.*

BEAR'S-HEAD FUNGUS
(*Hydnum caput-ursi*)

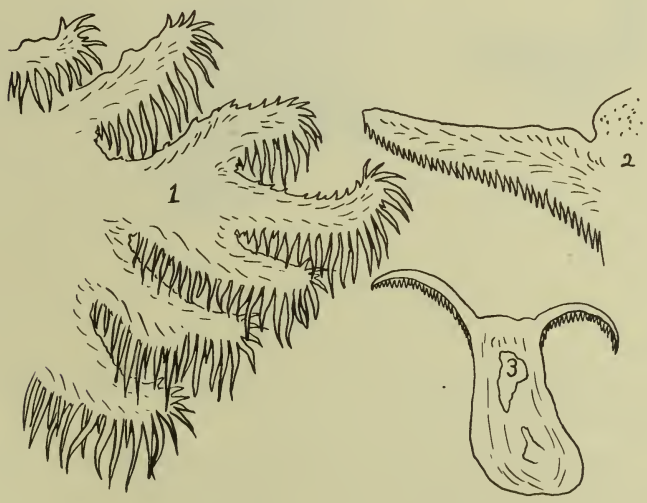
The Hydnums comprise a fairly large group of fungi. Many species grow in "toadstool" shape; others have coral-like or shelving forms.

It may be surprising to the amateur collector, when lifting a mushroom having a regulation "toadstool" cap, to discover, on turning it over, that it has on its lower surface an array of close-set teeth, like a curry-comb, instead of the expected gills of an Agaric or the pores of a Boletus.

The "bear's head" grows in woods on dead timber and from injuries in living trees. It is found all summer and autumn and occurs in various forms, sometimes with long "teeth" and sometimes with short ones. This fungus is usually white, but often stained with black or brownish from an attack by parasitic fungus. Clumps of it are found weighing from a few ounces to several pounds. Small specimens are more common.

Hydnum spores vary in color in different species. Some are yellow, some yellow-brown, dusky or white.

No variety of Hydnum is known to be poisonous.



1. *H. caput-ursi.* 2. *H. septentrionale.* 3. *H. repandum.*

EDIBLE BOLETUS

(*Boletus edulis*)

The edible Boletus grows on the ground in mixed woods from early June until late autumn.

The color of the cap is variable—some shade of grayish tawny or reddish brown, shading paler toward the margin. The spore surface is whitish when young, greenish yellow in the mature plant. The pores or tubes are minute and not colored differently from the rest of the surface. The stem is whitish with distinct reticulation, or it may be light brown. It is sometimes quite bulbous.

Boleti in general are easily recognized by the pores on the lower surface of the cap, but are difficult for anyone but an experienced mycologist to identify as to species. The few suspected or known dangerous kinds in this region

have bright red or orange colored pore mouths, different in color from the rest of the surface.

Always avoid aging or decaying plants of any species, and all not certainly known to be edible. This Boletus is satisfactory for drying for winter use.

HONEY-COLORED ARMILLARIA

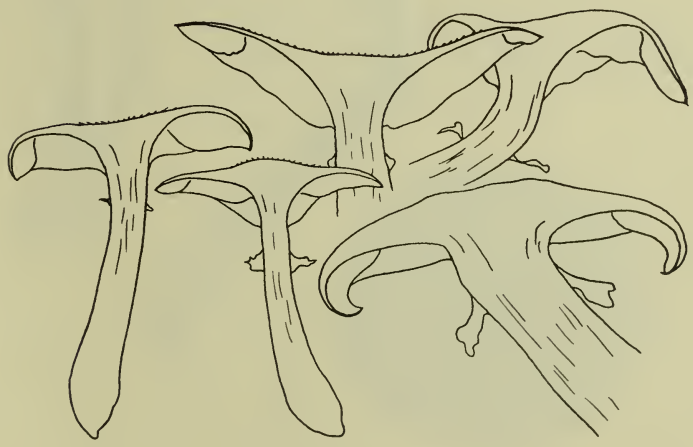
(*Armillaria mellea*)

The Honey mushroom, or honey-colored armillaria, grows in mixed woods, on roots, logs, stumps and living trees. It is destructive to living timber because its spores enter any slight injury and its mycelium penetrates and destroys even the hardest and soundest wood. This mushroom is always too abundant for the good of any

woodland, and may be found in quantity during most of the summer season and especially from August into late autumn.

The color of the cap is like medium or dark honey, with a honey-like translucence when moist, whence the name. The cap surface is somewhat smooth in certain varieties, more or less roughened with small dark-colored pointed scales in others. The gills are pale flesh-colored. The stem is flesh-colored at the top, shading to paler brownish than the cap at its base. The base of the stem is cream-colored and the spores are white in mass.

This fungus is of insipid flavor and usually of coarse texture. There are several varieties with a rank or bitter taste and unfit for food. Some have a broad "collar" on the stem, a few have no "collar." The illustration and color description are of the commonest form.



LACQUER MUSHROOM

(*Clitocybe laccata* or *Laccaria laccata*)

This mushroom grows on the ground, usually in oak and hickory woods, from June until late autumn. It

often grows, unmixed with other fungi, covering considerable areas and a troop of lacquer mushrooms upon a forest carpet of brown leaves makes an attractive picture.

This is a variable fungus, but one that may be easily recognized. The cap is a flesh-tinted brown or buff, more or less translucent, according to whether it is full of moisture or dry. The typical appearance of this fungus suggests a plant molded from lacquer or some of the recently discovered resinous plastics. The surface of the cap is generally bumpy and irregular, with a flattened knob at the center, while the border is broadly ruffled. There is a more or less distinct wide zonation in the coloring. Lacquer mushrooms are of small or medium size, seldom more than two and one-half inches broad. The gills are light tan or dull flesh-colored. The stem is colored somewhat like the cap, but usually more tan or buff. The spores are white in mass. Its flesh is rather firm but of good quality. The stem is gristly and not edible.

It grows in the same situations as the Amanitas and care, therefore, should be used in collecting it for food when found in company of other fungi.

1. *C. laccata.* 2. *C. ochropurpurea.*

FAWN-COLORED PLUTEUS

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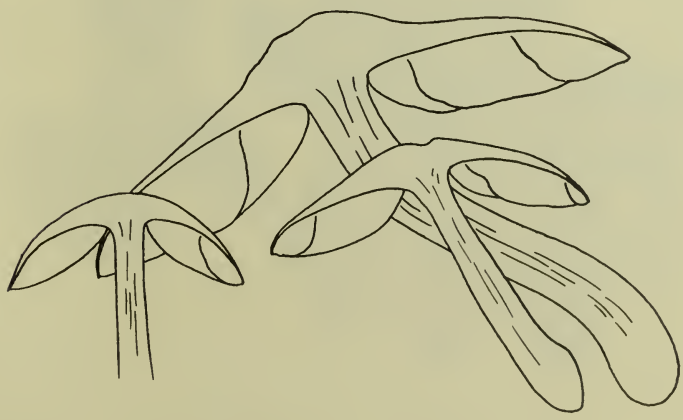
(*Pluteus cervinus*)

The fawn-colored Pluteus grows on decaying wood in mixed woodlands, from June until late autumn.

The cap is variable in color, some shade of flesh-tinted fawn to brownish being usual, and a darker umber color common. Occasional white forms are found and white color is typical of the variety *albus*. The gills are first white, then flesh-colored. The stem is colored like the cap but paler, shading to whitish at the top. The spores are flesh-colored in mass.

To find this mushroom may require close search on account of its cap color, which is often decidedly protective. Decaying logs in deep woods are likely situations in which to find it. Sometimes a large stump or log is literally covered with caps of Pluteus in all stages of development and of all sizes.

This is one of the most desirable of mushrooms. It attains a good size, and specimens a pound in weight are not uncommon. It is so fragile in texture that it will split from margin to center at the least harsh jolt. Its flesh is tender and of rich, beef-like flavor.



VARIABLE HYPHOLOMA

VARIABLE HYPHOLOMA

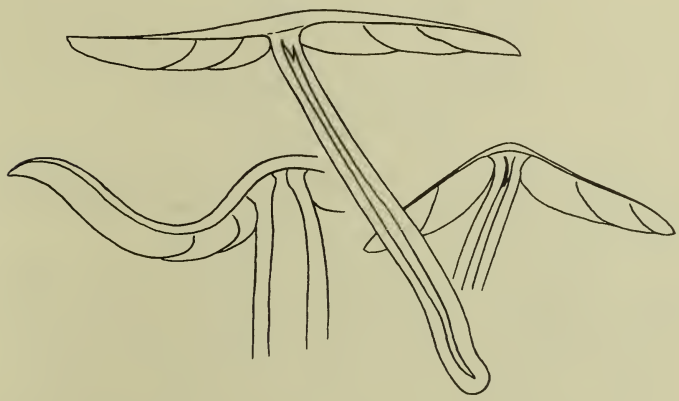
(*Hypholoma incertum*)

This tender little mushroom grows in open, grassy places, mostly from decaying, covered roots of old trees and shrubbery, in much the same situations as *Coprinus micaceus*, from May until late autumn.

In a moist season it grows in great abundance along almost any city street shaded by old trees. In very hot weather this mushroom is often found infested with larvae of fungus gnats.

In pioneer times in America, when tomatoes were unknown as food, these mushrooms were used in making catsup.

Another species, *Hypholoma appendiculata*, is so like the above that a separate description is unnecessary.



FAIRY-RING MUSHROOM

(*Marasmius oreades*)

The common fairy-ring mushroom grows in moderate abundance in pastures and on old, well-manured lawns or other grassy places, from June until late fall.

Its circular habit of growth, produced by the subterranean mycelium spreading slowly from a central focus, is characteristic. Several other terrestrial fungi occasionally form "fairy-rings," but less often than *M. oreades*.

The cap is white to pale brown or buff. The gills are tinted like the cap but paler. The stem is colored like the cap. The spores are white in mass.

A characteristic of this mushroom that is shared by few others is its ability to revive after drying.

A walk across an old pasture in midsummer, with an eye on dark green spots of grass where Marasmius lurks, may be rewarded by a well-filled basket.

Care should be taken not to confuse this fungus with the poisonous *Marasmius urens*, which has little or no umbo or hump on the middle of its thinner-fleshed cap and has brownish gills closely spaced. The buffy gills of the edible *M. oreades* are set comparatively far apart.

LACTAR

LACTAR

(*Lactarius deliciosus*)

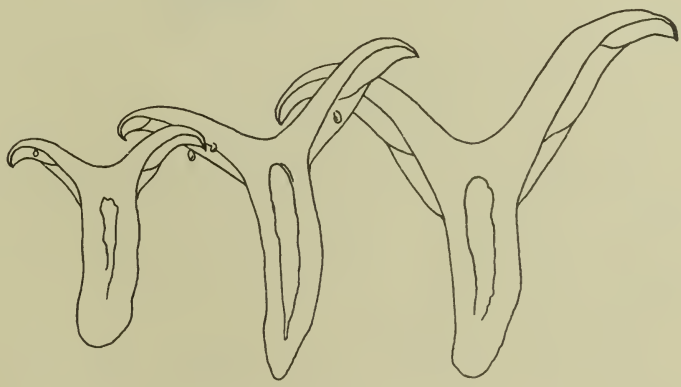
The delicious Lactar grows under fir trees in deep woods from midsummer to late autumn.

The color of the cap is variable, usually shades of gold-ochre or orange-reddish arranged in broad rings or zones, this being a characteristic feature. The gills are saffron-yellow, turning greenish when bruised. The stem is colored much like the cap. The spores, though coming from yellow gills, are white in mass.

When this mushroom is broken, a thick, yellow- or orange-colored juice exudes which changes to greenish upon exposure to the air. Old plants do not produce this "milk."

The Lactarius was famous among the ancients in Mediterranean countries and its qualities are recited in the literature of bygone ages.

This fungus, as found in the United States, may prove a disappointment as food, for its quality is as variable as its coloration. Fresh young caps in which the juice still flows freely are the only ones worth gathering. In summer the Lactar is usually badly infested by larvae of certain small insects.



PEPPERY LACTAR

(*Lactarius piperatus*)

The peppery Lactar grows in fair abundance on the ground in mixed woods, from early July until late autumn.

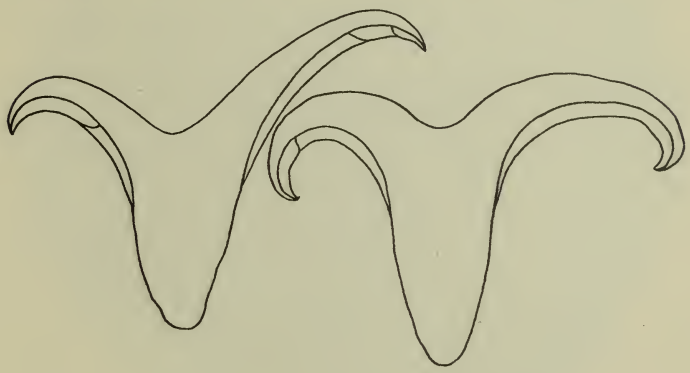
The whole plant is colored ivory-white, more or less stained with brownish. The juice is white and acrid. The spores are white in mass.

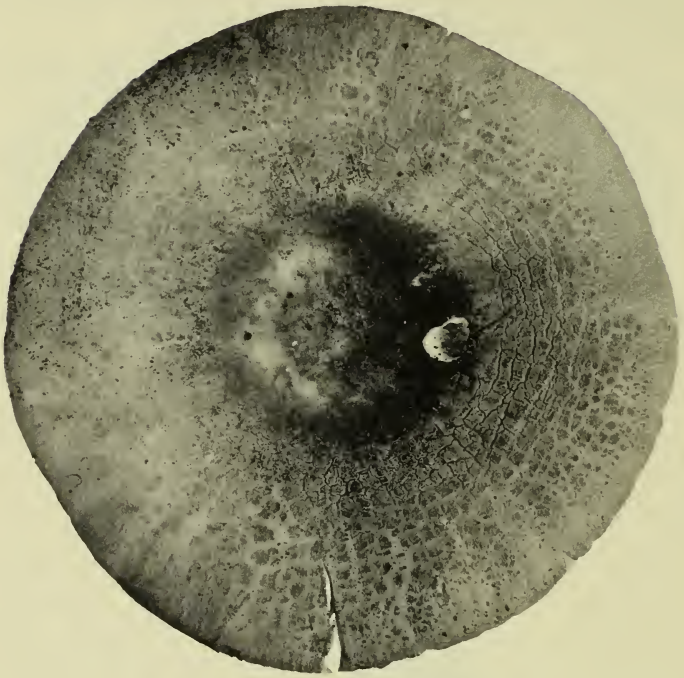
This coarse mushroom has a peppery taste which disappears in cooking. In autumn, when nearly all of the

mushrooms are putting forth their heaviest crops, *L. piperatus* is in the front rank of productivity.

It dries well, and may be stored in quantity to form an addition to soups and other dishes in winter.

Ageing plants of this species should be avoided.





GREEN RUSSULA

(*Russula virescens*)

The green Russula grows on the ground in mixed hardwood lands and in scattering groves of oak, hickory, etc., from June until late autumn.

The cap is usually some shade of verdigris green, but may be almost white. The crackled outer skin is characteristic. The gills are white. The short thick stem is pure white. The spores are whitish in mass.

This is one of the few Russulas that may be identified without examination of the spores under a high-powered microscope, and is the only one of them that might be approved for food.

It is seldom that any of the Russula species are found free of insects, but *R. virescens* is more often free from them than any of its relatives. Box-tortoises, squirrels, and rabbits are fond of all Russulas and the fungus collector has plenty of competition.

Aged or decayed specimens should be avoided and should never be carried in a basket with other mushrooms intended for the table.

SILKY VOLVARIA

(*Volvaria bombycina*)

The silky Volvaria grows from wounds in living trees and on dead timber in mixed woods. It may be found from June until late autumn.

The cap is white, sometimes tinged gray or pale buff on the center. Its surface is covered with tiny, loose

fibers, like damp fur, appearing as if made of shining silky floss. The gills are flesh-colored. The stem is white, its pouch tan-colored or mottled with brown. The spores are flesh-colored in mass.

This is a tender mushroom that sometimes attains a weight of half a pound. It is not especially common.

Beware of confusing it with Volvarias that grow upon the ground, since some species of terrestrial habit are dangerous. Volvarias, like other mushrooms, are likely to be poisonous when past their prime.

The silky Volvaria is much like *Pluteus cervinus* in its qualities.

PARASOL MUSHROOM

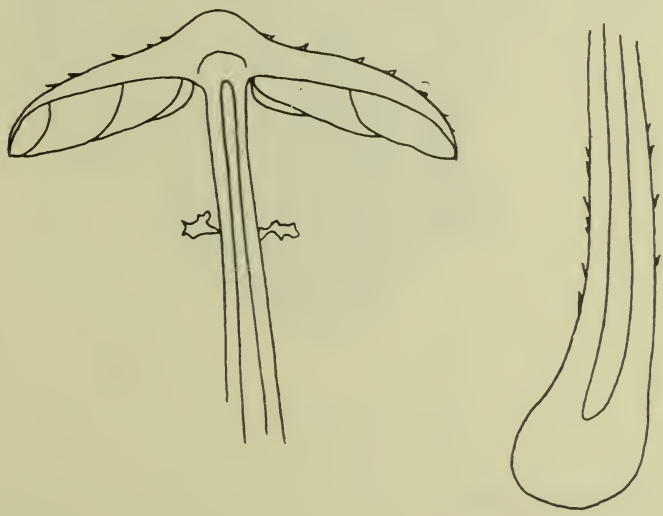
(*Lepiota procera*)

The Parasol mushroom grows on the ground in or near mixed woods from September until freezing weather in late autumn.

The cap is usually buff or creamy gray with a brownish knob at its center, and with irregular, flattened, dull brown scales scattered over its surface. The gills are

creamy white. The stem is colored like the cap, with a crackled effect, showing white flesh through the fine divisions. The collar is thick, more or less fuzzy in appearance, and somewhat loosened from the stem. The spores are white in mass.

This Lepiota is, without doubt, the best flavored of wild mushrooms, tasting, when dried, like almonds. It is of varying size but always constant in its essential characters, and easily identified. It is often tall, sometimes nearly a foot in height, with a cap of four or five inches in diameter. This mushroom is of fairly common occurrence. It dries well for winter use.



INKY MUSHROOM

(*Coprinus atramentarius*)

The Inky mushroom grows around old trees and stumps or on dumping-grounds and well-manured lawns. There is a spring crop of it for a short time in April and May, but the full crop comes with the autumn rains and lasts until snow flies. It may be found in smaller numbers all summer if there is abundant rain and chilly weather.

The cap is gray or brownish, sometimes smooth, but usually covered with small, darker scales. The gills are nearly white at first, turning gray, then black, and finally

dissolving with the expanded cap into black fluid. The stem is white, with an earth-colored base below the slightly flaring, irregular annulus. The spores are black in mass.

This is a common and easily recognized mushroom. Its flavor is fair. The plant is thick, firm, and juicy, most of its bulk consisting of the gills, for the cap flesh is thin. The stem is slightly gristly in texture but not objectionable. The species is a favorite with mushroom hunters everywhere.

SHAGGY-MANE

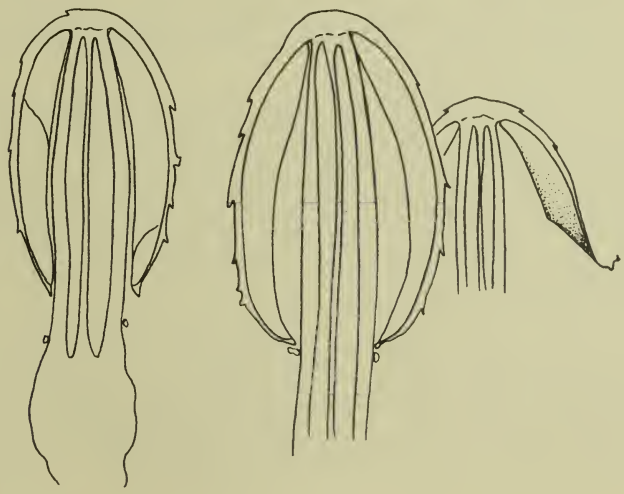
SHAGGY-MANE

(*Coprinus comatus*)

The Shaggy-mane is the most conspicuous of the Inky mushrooms. It grows on lawns, in parks, and in grassy places generally.

The cap is white, sometimes tinged with pink on its lower half, with brown or whitish, shaggy-looking scales raised as points over most of the surface. The center of the cap is brown or light tan. The gills are at first white to pinkish, then gray, and finally black. The gills and expanding cap dissolve in age as they do in *C. atramentarius*. The stem is white, either with or without a narrow, loose collar or ring near the bulbous base. The spores are black in mass.

This is one of the most abundant of the fall mushrooms. In quality it is identical with the preceding, and, like it, also yields a spring crop for a short time. The characters of the Shaggy-mane mushroom are so well marked that it is one of the safest of fungi to gather for food. It has a mild flavor. The raw plant has a slightly unpleasant after-taste which disappears with cooking.



PASTURE MUSHROOM

(*Agaricus campestris* or *Psalliota campestris*)

The Pasture mushroom grows most commonly on constantly grazed land and in other grassy places from August until late autumn.

The cap color may be white, gray, or brownish, either with or without small, darker, flattened scales. The gills are at first pink, then flesh-colored, and at last purplish brown. In a variety (var. *Buchanni*) the gills are reddish brown at maturity. The stem is white or colored like the cap below the usually thin collar. The spores are purplish brown in mass.

This is the common mushroom of commerce, of well-known edible quality. When fresh, it is second only to *Lepiota procera*, but when kept too long before cooking it may prove to be very ordinary. Its flesh is of pleasing texture, with little or no gristly character.

FIELD MUSHROOM

(*Agaricus arvensis* or *Psalliota arvensis*)

The Field or Horse mushroom grows in old pastures or on heavily manured, cultivated ground from September until late autumn.

The cap may be white, gray, yellowish, or brown, and either smooth or with brownish scales. The gills are at first pink, then deep flesh-colored, and at last brown. The stem is white above, and colored like the cap below the rather thick collar. The collar, ampler and firmer than that of *A. campestris*, sometimes hangs from the border of the cap as a thick, ragged fringe. The spores are purplish brown in mass.

Typically this fungus is larger and coarser than the preceding. It is a good table mushroom. In warm weather mature plants of both of these species often are so badly infested with tiny grubs that they are unfit for food.

WOODLAND AGARICUS

(*Agaricus abruptibulba* or *Psalliota abruptibulba*)

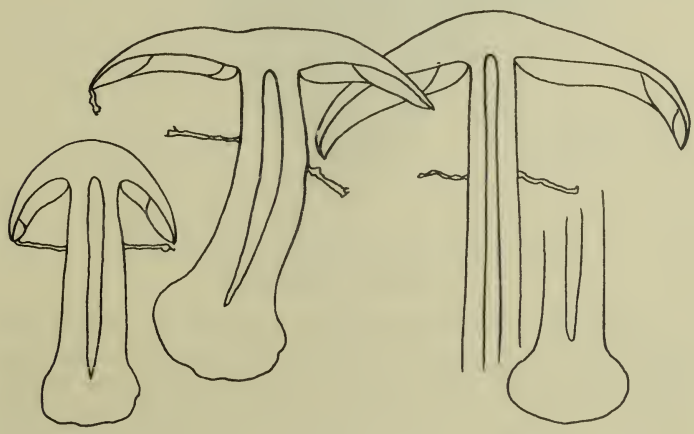
This handsome mushroom grows in the brushy borders of mixed woods in scattered groups and clusters from September to late fall.

The cap is silvery or brownish gray, with or without numerous fine scales. The gills at first are flesh-colored, then blackish brown. The stem is white, with a rather large, papery-looking collar a little above the middle. There is a distinct bulbous enlargement at the base of the stem. The spores are purplish brown in mass.

In its general shape as well as in the bulbous stem this fungus bears a superficial resemblance to some forms of the poisonous Amanitas, but in its mature form it may be distinguished from them by its flesh-colored or brown gills, which they never have.

In gathering young plants of this species there is considerable danger of confusion because they occur in the same environment as the deadly Amanitas. What has been said regarding proximity to poisonous varieties should be remembered and observed when gathering the woodland Agaricus.

When grown in chilly weather this mushroom is usually sound and it is then one of the best of edible fungi. In flavor it is much like *P. campestris* and *P. arvensis.*



VELVET-STEMMED COLLYBIA

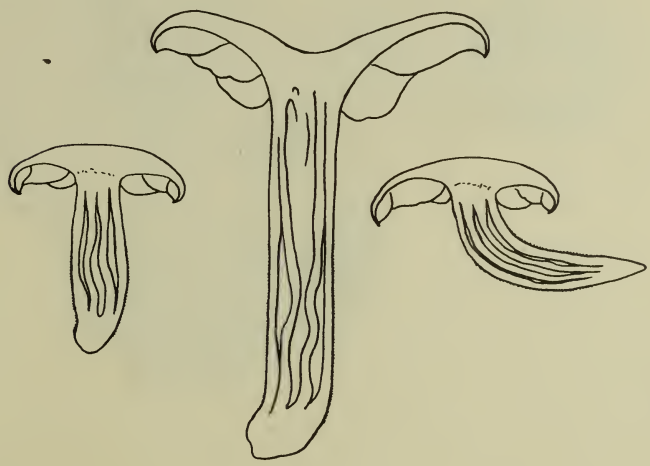
(*Collybia velutipes*)

The Velvet-stemmed mushroom grows in clusters from old roots in the ground, on logs, around old stumps, and from wounds in living trees, in mixed woods and brushy places throughout the season, even during the chilly weeks of both autumn and spring. It is found throughout the year.

The cap is golden tan in color, darkest at the center, shining, gluey in wet weather, generally with leaves and twigs adhering. The gills are cream-colored. The stem is pale above, shading to umber or blackish below. Its lower half is minutely velvety. The spores are white in mass.

When grown in the fall this mushroom will retain its form for many weeks. During a January thaw it has been seen standing in as perfect condition as if freshly grown. It has been gathered for the table in February, in a mild year, and found edible. The sweet flavor characteristic of this species is especially pronounced after freezing.

The flesh is somewhat gristly but not objectionable. The surface of the cap is mucilaginous, but plants found in wounds on trees and upon logs raised off the ground may be free from adhering dirt.



MANY-HEADED CLITOCYBE

(*Clitocybe multiceps*)

The many-headed Clitocybe grows in open places, as well as under shrubs in woods and along their borders, from September to late autumn. It may appear in a given locality for two or three seasons in abundance, and then for several years in insufficient numbers to attract attention.

The cap is white or gray, or sometimes ochre-tinted, but always pale. The gills are white or cream-colored. The stem is white or colored like the cap. The spores are white in mass.

This mushroom is of coarse texture and of a flavor relished by few. When better food is not procurable, it may be eaten or dried for winter use, the flavor becoming concentrated with drying.

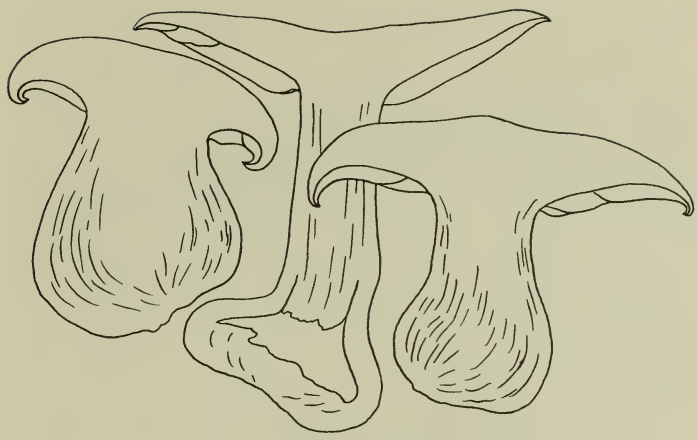
MASKED TRICHOLOMA

(*Tricholoma personatum*)

The masked Tricholoma grows in woods among dead leaves, on sawdust heaps, or on old manure piles, from September until freezing weather.

The cap may be whitish, ash-colored, tan-brown, or purplish, and there are occasional blue-tinted varieties. Size, shape, and color are all variable. The typical form is shaded irregularly with violet or lilac. The gills are as variable as the cap, ranging from whitish-violet to watery-brownish. The stem is colored like the cap, but is paler at the top. The spores are white in mass.

This is a coarse but handsome mushroom, sometimes of large size. It occurs in abundance in early autumn, the crop dwindling as freezing weather comes. Heavy clusters of it have been found late in November in favorable years. It has good drying qualities.



MASKED TRICHOLOMA

PHOLIOTA

1. *P. squarrosoides.* 2. *P. subsquarrosa.*
3. *P. adiposa.* 4. *P. squarrosa.*

SCALY PHOLIOTA

(*Pholiota squarrosoides*)

The scaly Pholiota grows on stumps, logs, standing dead timber, or from injuries in living deciduous trees, from midsummer until late autumn.

The cap is whitish to yellow, with tawny scales. The gills are nearly white at first, becoming dull cinnamon colored when mature. The stem is white above the collar, but colored below and scaly like the cap. The spores are rusty brown in mass.

This and some other Pholiotas have a strong odor and taste that becomes milder after cooking. When a cluster of this fungus is found, it usually contains caps enough to satisfy the largest appetite.

PEAR-SHAPED PUFFBALL

(*Lycoperdon pyriforme*)

The pear-shaped Puffball grows about old trees of various kinds, or on logs, stumps, and forest debris in mixed woods during autumn. Its color is ochre or tan.

The smooth and soft skinned puffballs are safe to use for food, if the interior is white, firm, and dry. They become inedible when their interior spore mass begins to discolor in ripening. At that stage they are bitter or otherwise objectionable. The hard or rough skinned species should be avoided.

There are many kinds of puffballs, varying in size and appearance from the small one illustrated, and even smaller ones, up to the sometimes enormous giant puffball, *Calvatia gigantea*, specimens of which sometimes weigh twenty pounds or more.

WHITE AMANITA

WHITE AMANITA

(*Amanita virosa*)

This deadly toadstool grows on the ground in mixed woods from August until late October.

The color is pure white in all parts, or rarely yellowish on the center of the cap. The spores are white in mass.

The fungus illustrated here is as common as the typical form of *Amanita phalloides*, of which it is possibly only a variety. Both are identical in their poisonous properties, for which there is no known antidote.

A hasty gathering of edible mushrooms might include this handsome but dangerous plant. Its unopened young plants may easily be mistaken for puffballs as they push through a carpet of dead leaves. The mature plant is likely to be mistaken for *Lepiota naucina* as the two occur at times in the same habitat—grassy places in woodland borders.

People who have died in agony after eating these fungi stated that they are of excellent flavor, their taste giving no warning of their fatal properties.

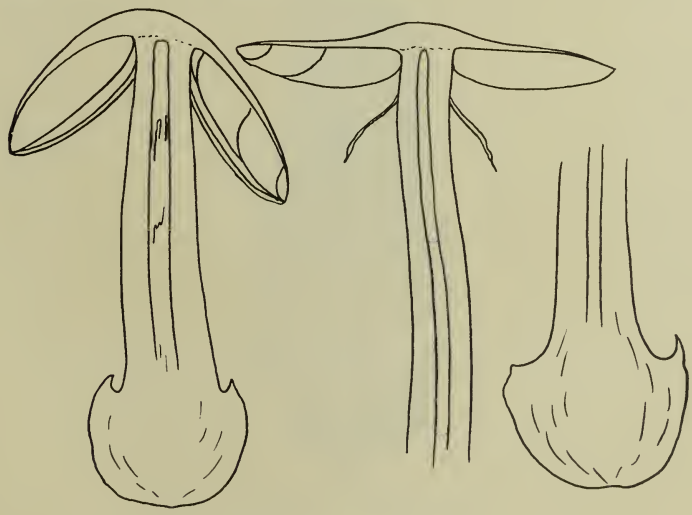
DESTROYING ANGEL

(*Amanita phalloides*)

The "destroying angel" grows on the ground in mixed woods, from midsummer to November. It is common.

The cap is variable in color, and may be entirely white or yellow, brown or gray, or sometimes quite black at the center. In the colored varieties the stem is white below the collar and colored more or less like the cap from the middle downward. The volva or pouch at the bottom of the stem is white, stained by the color of the soil from which it springs. The spores are white in mass.

This fungus is always a menace to the untaught mushroom hunter. When it is eaten by mistake and has passed the stomach in the process of digestion, death from its poison is certain. Its poison is so powerful that the presence of one plant in a closed room has caused nausea to people who were studying the specimen. For this reason, studies of this and other poisonous Amanitas are best conducted out of doors in a breezy situation. After handling such plants and before handling food, wash the hands with soap and warm water. In the presence of such a bearer of potential death, extreme caution is the best course. One small plant of these Amanitas carried in a basket with edible mushrooms may so contaminate them that they become highly dangerous.



FLY-POISON AMANITA

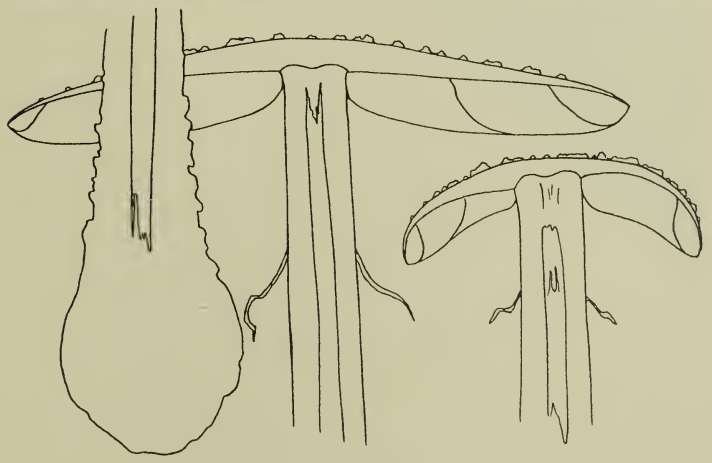
FLY-POISON AMANITA

(*Amanita muscaria*)

The fly-poison Amanita grows on the ground in mixed woods, from early July until late autumn. It is common.

The color of the cap is variable. It may be blood-red or vermilion at the center, shading into orange to lemon-yellow toward the margin; or orange at the center, shading to pale greenish-yellow toward the margin. There is also an ivory-colored variety. In all the cap surface is adorned with more or less uniformly distributed, cottony white flakes derived from the volva that encased the young plants. The gills may be either white or pale yellow. The stem and collar are white with the roughened base of the stem shaded brownish. The spores are white in mass.

It is best not to handle this species, much less carry it with other mushrooms. If a case of poisoning by this fungus is taken in hand in time by a competent physician, it may not prove fatal. Atropin administered hypodermically serves as its physiological antidote. The treatment of such a case is not for the layman and it must be begun before the heart action of the victim has been weakened beyond hope of remedy.



DECEIVING CLITOCYBE

DECEIVING CLITOCYBE

(*Clitocybe illudens*)

The "deceiver" grows in mixed woods, springing up around decaying stumps and on old logs, from midsummer until frost.

The usual color of the entire plant is pumpkin-yellow, but there are also varieties colored with fleshy salmon. The spores are white in mass.

The fungus is a curiosity because its gill surface is phosphorescent and glows at night. In odor and taste it is all that could be asked of the best of table mushrooms. Beetles and slugs feast upon it. Occasionally a person may eat it and suffer no more than slight intoxication, but the small amount of muscarin that it contains proves too much for the average stomach, even if consumed in small quantity. It can produce alarming illness, but there seems to be no record of fatalities from it.

Clusters weighing from six to ten pounds are of common occurrence, and these sometimes consist of large caps four to six inches in diameter. The characteristic mode of growth is with the stems all springing from a common center, so compressed that their bases are pointed like pencils.

C. illudens

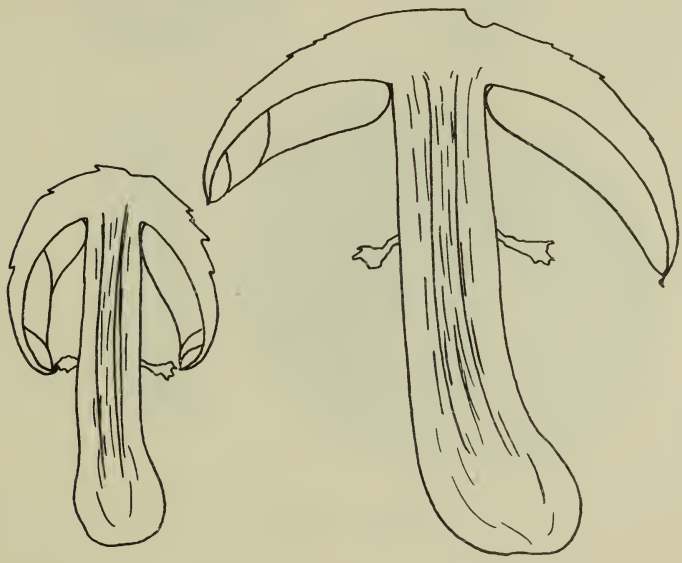
GREEN-GILL LEPIOTA

(*Lepiota morgani*)

The green-gill grows in pastures and grassy places all summer and autumn, often forming large fairy-rings.

The cap is white with a yellow or brown pellicle or outer skin that early breaks up into irregular, flattened scales, except at the center, where the pellicle remains as a smooth irregular patch. The gills are white at first, turning to olive greenish when mature. The stem is white tinged with brown at the base. A more or less broad collar encircles it near the middle. The spores, unusual among mushrooms and unlike those of other Lepiotas, are olive greenish in mass.

This is probably the largest of the true agarics or gilled fungi. It sometimes grows to a diameter of nearly a foot. It contains a small amount of poison having an action much like that of the Fly-poison Mushroom, *Amanita muscaria*. There are persons who can eat this mushroom with impunity, but the average stomach rejects it. If retained it may cause violent illness, though no certain record of death appears traceable to it.



Russula emetica

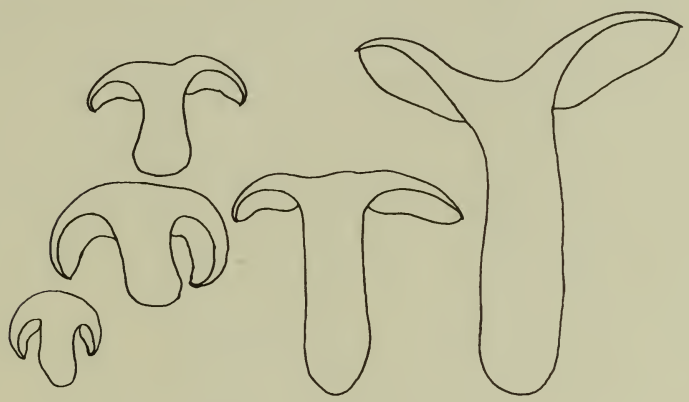
RUSSULAS

The brilliantly colored Russulas grow in abundance in mixed woodlands on the dead leaves, from midsummer until frost.

The color of the cap changes from rose to blood-red to tawny-blotched, sometimes to dull yellow or whitish. The gills are pure white. The stem is white or tinged with reddish. The spores are white in mass.

The Russulas are brittle-fleshed mushrooms when in their prime. Many of them are as colorful as flowers.

The species here illustrated has a hot, peppery taste when raw. It is listed as dangerous and many cases of more or less violent poisoning are recorded for it. These may have been due in part to the use of aging plants for food. In its young state it is eaten by some people. Although several kinds of Russula are edible, aged plants should be avoided, since poisoning by them may be dangerous, to say the least.



BOOKS ON MUSHROOMS

KRIEGER, L. C. C.
Mushroom Handbook. Macmillan, 1935.

ATKINSON, G. F.
Mushrooms, Edible and Poisonous, ed. 2. Henry Holt & Co., New York, 1903.

HARD, M. E.
The Mushroom, Edible and Otherwise. Ohio Library Co., Columbus, O., 1908.

MCILVAINE, CHAS. & MACADAM, ROBERT K.
One Thousand American Fungi, new ed. The Bobbs-Merrill Co., Indianapolis, Ind., 1912.

THOMAS, W. S.
Fieldbook of Common Gilled Mushrooms. G. F. Putnam's Sons, New York, 1928.

SMITH, HURON H.
Mushrooms of the Milwaukee Region. Milwaukee Public Museum Field Guide No. 1, Botanical Series, 1931.

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