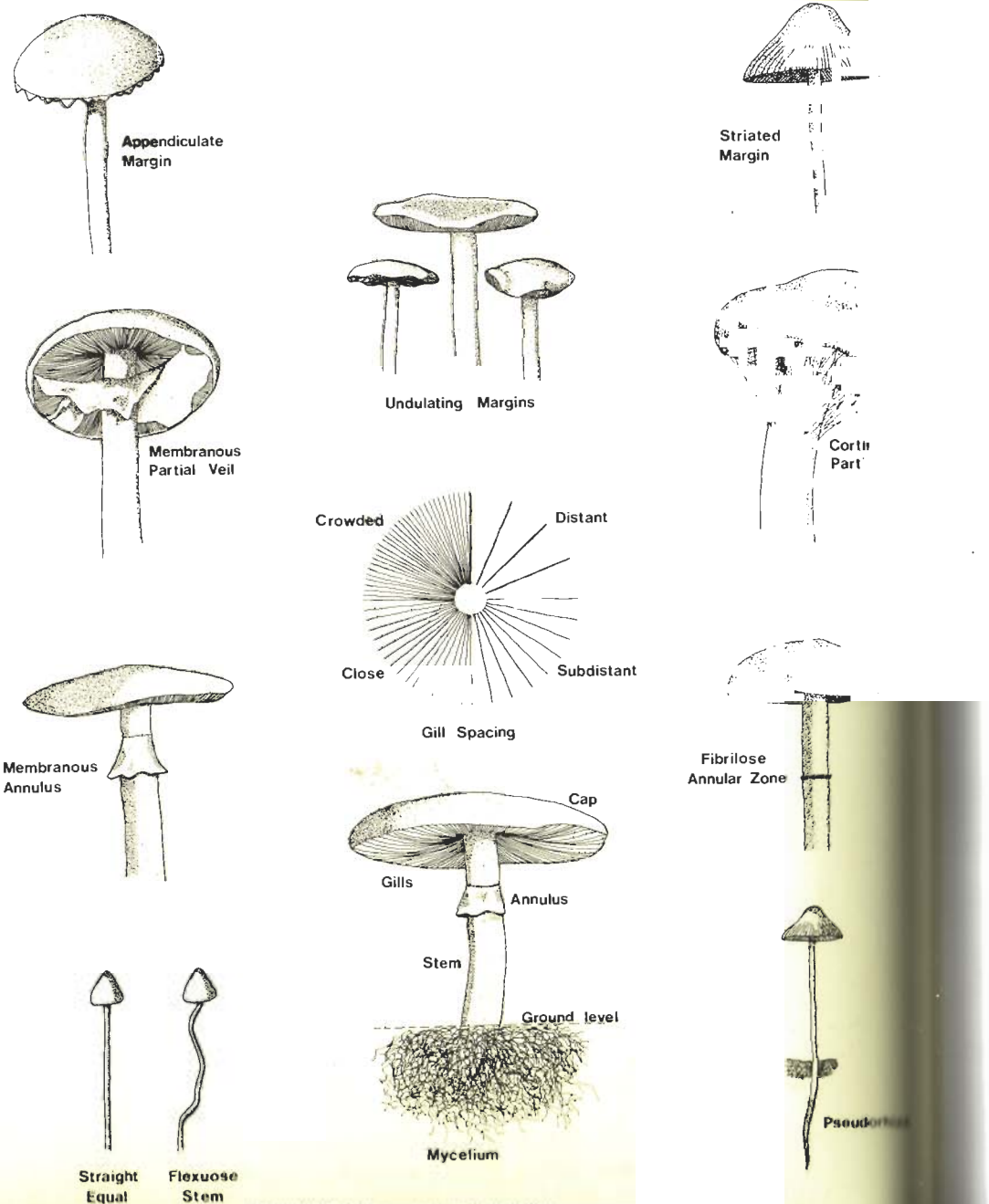
DIAGRAM C

General Morphology



Glossary

acute Pointed, sharp.

adnate (of gills) Bluntly attached to the stem. See Diagram B.

adnexed (of gills) Attached to the stem in an ascending manner. See Diagram B.

Agaricaceae A family of mushrooms with primarily one genus, *Agaricus*.

Agaricales The order that includes all mushrooms with true gills.

agarics Mushrooms with gills.

ampullaceous Flask shaped.

amyloid The characteristic bluish reaction that the flesh or the spores of a mushroom exhibits in Melzer's iodine.

annular (on the stem) Resembling a ring, as in "annular zone." See Diagram C.

annular zone A band of fibrils around the stem, usually becoming darkened by spores. The annular zone is derived from the partial veil whether it be sheathlike (membranous) or cobwebby (cortinate).

annulate Having an annulus.

annulus The tissue remnants of the partial veil adhering to the stem and forming a membranous ring. See Diagram C.

apex (of the stem) The top, or highest point or region.

apiculus The nipplelike projection produced by basidia and to which the spore is attached to the sterigmata of the basidium.

appendiculate (of the cap margin) Hanging with veil remnants.

appressed Flattened.

ascending (of the gills) Where the gills extend upwards from the margin of the cap to their attachment at the stem.

Ascomycetes fungi Produces spores by an ascus, a saclike cell, as opposed to the basidium of Basidiomycetes.

aspect The general shape or outline of a mushroom.

attachment Refers to the attachment between the gills and the stem.

autoclave To steam pressurize.

baeocystin (baeocystine) An indole alkaloid (4-phosphoryloxy-*N*-methyltryptamine), closely related to and often co-occurring with psilocybin. Possibly cerebrally active; comparable to psilocybin.

Basidiomycetes All fungi that bear spores upon a basidium, as opposed to the Ascomycetes, which bear spores in an ascus.

basidia, basidium A particular fertile cell in which meiosis occurs and by which spores are produced.

basidiocarp The fruiting body, the mushroom structure.

binucleate Having two nuclei in one cell.

bioassay A clever term that means that the individual ingested the material to test activity, in effect using one's own body as the diagnostic device.

broad A relative term connoting width (as opposed to length) in reference to the gills (i.e., narrow, moderately broad, broad).

bryophytes Mosses.

buff Dingy yellowish brown.

campanulate (of the cap) Bell shaped. See Diagram B.

cartilaginous Brittle, not pliant.

caulocystidia Sterile cells on the stem.

cellular Composed of globose to generally rounded cells, not thread-like.

cespitose Growing clustered from a common base.

cheilocystidia Sterile cells on the gill edge. Sometimes called marginal cystidia.

chrysocystidia A type of cystidia that is highly refractive in once-dried tissue revived with a potassium hydroxide (KOH) solution. It appears as a yellowish brown amorphous mass within the cell.

clamp connection An elbowlike protuberance that arches over the walls between cells in dikaryotic mycelium of some mushroom species.

clavate: blunted in shape.

close (of the gills) A relative term in reference to the spacing of the gills (in the order crowded, close, subdistant, distant). See Diagram C.

collyboid Resembling a mushroom from the genus *Collybia*, typically with expanded caps (broadly convex to plane), and stems not more than two or three times the breadth of the caps. Often growing in groups or clusters. This term is often used in contrast to mycenoid.

complex A cluster of taxonomically, similarly related species typified by a central species.

concolorous Having the same color.

conic (of the cap) Shaped like a cone.

context A term for the flesh of the cap or stem.

convex (of the cap) See Diagram A.

Copelandian Of or relating to the genus *Copelandia*, distinguished from its close relatives, the Panaeoli, by their dung-loving habitat, strong bluing reaction, and large pleurocystidia.

Coprinaceae A family of mushrooms containing the genera *Coprinus*, *Panaeolus*, and *Psathyrella*.

coprophilous Growing on dung.

cortina (cortinate) A fine, weblike veil extending from the cap margin to the stem in young specimens of certain species. Soon disappearing or leaving trace remnants on the stem or cap margin.

crowded (of the gills) A relative term used in describing the narrow spacing of the gills (in the order crowded, close, subdistant, distant). See Diagram C.

cuspid (adj. cuspidate) Sharp, pointed.

cuticle The surface layer of cells on the cap that can undergo varying degrees of differentiation.

cystidia Microscopic sterile cells.

decurrent (of the gills) The attachment where the gills markedly run down the stem.

deciduous Describing trees that seasonally shed their leaves.

decurved (of the margin) Where the shape or curvature bends directly downwards.

deliquescing The process of autodigestion by which the gills and cap melt into a liquid. Typical of the *Coprinus* genus and some species of the Bolbitiaceae family.

denticulate Toothlike, lined with triangular fragments of tissue.

dichotomous Repeatedly splitting or forking in pairs.

dikaryophase The phase in which there are two individual nuclei in each cell of the mushroom plant.

dikaryotic The state of cells in the dikaryophase.

diploid A genetic condition wherein each cell has the full set of chromosomes for the species (2N).

disc The central portion of the cap.

eccentric Off-centered.

elevated (of the margin) Describing the type of cap whose margin is uplifted, usually seen in age.

ellipsoid Shaped like an oblong circle.

equal (of the stem) Evenly thick.

eroded (of the margin of the cap or the gills) Irregularly broken.

evanescent Fragile and soon disappearing.

farinaceous Like fresh meal (grain).

fibrillose Having fibrils.

fibrils Fine, delicate hairs found on the surface of the cap or stem.

fibrous (of the stem) Composed of tough, stringlike tissue.

filamentous Composed of hyphae or threadlike cells, which may undergo gelatinization.

flexuous (of the stem) Bent alternately in opposite directions. See Diagram C.

floccose, flocculose Easily removed, usually referring to woolly tufts or cottony veil remnants on the cap or stem.

fruiting body The actual mushroom form or structure; the fruit of the mushroom plant.

fugacious Impermanent, easily torn or destroyed.

fusiform Spindle shaped, tapering at both ends.

fusoid (of the cystidia) Somewhat fusiform.

gelatinous Having the consistency of a jelly, usually translucent.

gill attachment The manner by which the gills meet the stem and/or the cap. **Attached gills** are gills that connect directly to the stem. **Free gills** allow the stem to be separated from the cap without the gills being torn or leaving remnants on the stem.

gills The platelike structures radiating from the underside of the cap and that generate spores.

glabrescent Becoming glabrous.

glabrous Smooth, bald.

gleocystidia A type of pleurocystidia that is highly refractive in tissue that has been revived in potassium hydroxide. Synonymous with chrysocystidia.

glutinous Having a highly viscous gelatinous layer, an extreme condition of viscidity.

gregarious Growing in numerous to dense groups but not clustered, as in "cespitose."

group All the related varieties of one species.

habit The way in which mushrooms are found growing, for example, whether solitary to numerous to cespitose, and the aspect of their forms.

habitat The substrate in which the mushrooms are found.

hemispheric (of the cap) Resembling a hemisphere. See Diagram A.

heteromorphic (of the gill) Used to describe the type of gill edge that is composed of microscopic cell types different from that on the gill surface or face.

homomorphic (of the gill) Used to describe the type of gill edge that is composed of cell types similar to that on the gill surface or face.

humicolous Growing in humus.

hyaline Transparent or translucent, colorless.

hygrophanous Markedly fading in color when drying.

hymenium The layer of fertile, spore-bearing cells on the gill.

hypha, hyphae Individual cells of the mycelium.

incurved (of the margin) Curved inwards.

indigenous Native to a certain region.

KOH Potassium hydroxide; an agent commonly used to revive dried mushroom material for microscopic study at a concentration of 2½% (2½ grams of KOH in 971/2 grams [97.5 milliliters] of distilled water).

lamellae Gills, the spore-producing, platelike structures radially emanating underneath and from the center of the cap.

lamellulae Short intermediate gills not extending the entire distance from the cap margin to the gill attachment.

lanceolate Lancelike.

lignicolous Growing in wood or on a substratum composed of decayed wood.

lignin The basic organic substance of woody tissue other than cellulose.

lubricous Slightly slippery but not viscid.

macroscopic Visible to the naked eye.

mammilate Breastlike, with hardened protuberance, adorned with a nipple.

meiosis The process of reduction division by which a single cell with one nucleus divides into four cells with one nucleus apiece. Each nucleus has one half the genetic material of the parent cell.

membranous Used in describing a homogeneous sheathlike, thin, tissuelike characteristic of a type of partial veil, veil remnant, or some types of volvas.

micron (μ) One millionth of a meter, one thousandth of a millimeter.

mitosis The process of nuclear division in a cell by which the chromosomes are replicated and divided equally to two daughter nuclei.

mononucleate The condition where a cell has only one nucleus.

mottled Spotted, as from the uneven ripening of the spores in the genus *Panaeolus*.

mucronate Pointed, tipped with an abrupt, short point.

mycelium (mycelia) The network of fungi cells that may or may not amass to form the mushroom fruiting body.

mycenoid: Resembling a mushroom from the genus *Mycena:* tall, slender mushrooms with long stems and comparatively small, conic caps. This term is often used in contrast to collyboid.

mycology The science of the study of fungi.

mycophagist A person (or animal) who eats fungi.

mycorrhizal A peculiar type of symbiotic relationship a mushroom mycelium may form with the roots of a seed plant.

naematolomoid (of cystidia) Having the kind of sterile cells on the gill surface that are especially characteristic of the genus *Naematoloma (= Hypholoma)* See chrysocystidia.

naematolomoid (of mushrooms) Resembling species of *Naematoloma (= Hypholoma*)

nanometer One thousandth of a micron.

nomenclature Any system of classification.

norbaeocystin, norbaeocystine 4-phosphoryloxytryptamine, a compound often found in association with baeocystin.

nucleate Having nuclei.

nucleus, nuclei A concentrated mass of differentiated protoplasm in all cells, which plays an integral role in the reproduction and continuation of genetic information to daughter cells.

obtuse Blunt as opposed to pointed.

ochraceous Light orangish brown to pale yellow-brown.

ochre Between warm buff and antimony yellow to ochraceous orange.

olivaceous Olive gray-brown.

ovoid Oval to egg shaped.

pallid Very pale in color, almost a dull whitish.

panaeolian Of or relating to the genus *Panaeolus.*

papilla A small nipplelike protuberance.

partial veil The inner veil of tissue extending from the cap margin to the stem and at first covering the gills in young fruiting bodies of some species. Typically, partial veils are either membranous or cortinate. See Diagram C.

pellicle An upper-surface layer of cells on the cap surface that can undergo gelatinization, making the cap viscid to the touch. Often it can be peeled away from the cap.

persistent Not deteriorating with age; present throughout the life of the fruiting body.

phototropic Attracted or sensitive to light.

pileus The cap of the mushroom.

pileocystidia Sterile cells on the surface of the cap.

pith The central stuffing of stems of some mushrooms.

pleurocystidia Sterile cells on the surface of the gills; sometimes called "facial cystidia."

pliant Flexible.

pore A circular depression evident on the end of spores in many species.

pruinose Having the appearance of being powdered, due to an abundance of caulocystidia on the stem surface.

pyriform Pear shaped.

pseudorhiza A long, rootlike extension of the lower stem.

psilocin, psilocine 4-hydroxy-*N,N*-dimethyltryptamine.

psilocybin, psilocybine *O*-phosphoryl-4-hydroxy-*N,N*-dimethyltryptamine.

psilocyboid Resembling species of *Psilocybe* in general appearance.

psilonaut(s): People who ingest psilocybin mushrooms for spiritual voyages.

radicate With a pseudorhiza, tapering downwards into a narrow root.

reticulate Marked by lines, usually parallel.

rhizomorphs Cordlike strands of twisted hyphae present around the base of the stem.

rhomboid Having an outline resembling a rhombus.

rostrate Fitted with a beak.

scabrous Roughened with short, rigid projections.

scanning electron microscope An electronic microscope that scans an object in a vacuum with a beam of electrons, resulting in a high resolution image that is displayed through a video monitor.

seceding (of the gills) Used to describe the condition where the gills have separated in their attachment to the stem and have the appearance of being free. Often leaving longitudinal lines on the stem where the gills once were connected. See Diagram B.

shamanic A term used to describe any religion that embraces the belief that only special persons or priests are capable of influencing or communicating with the spirits or the supernatural.

sinuate (of the gills) The kind of attachment that seems to be notched before reaching the stem. See Diagram B.

sordid Dingy looking.

spores The reproductive cells or "seeds" of fungi borne on specialized cells.

sporocarps Any mushroom having spores.

squamulose Covered with small scales.

sterigmata Elongated appendages or "arms" on the basidium upon which spores are borne.

stipe Stem of a mushroom.

striate Having radial lines or furrows.

strigose Having long, stiff hairs.

Strophariaceae The family of mushroom containing the closely allied genera *Hypholoma* (*Naematoloma*), *Psilocybe*, and *Stropharia*.

strophariod Resembling species of *Stropharia*, having a membranous ring, a convex cap, and purplish brown spores.

subclose In reference to the spacing of the gills, between close and crowded. See Diagram C.

subdistant In reference to the spacing of the gills, between close and distant. See Diagram C.

subequal (of the stem) Not quite equal.

substrate, substratum The substance from which mushrooms grow.

superior A term used to designate the location of the annulus in the upper regions of the stem.

tawny Approximately the color of a lion.

taxon (pl. taxa) A taxonomically discrete concept describing a nomenclatural unit, usually a species.

terrestrial Growing on the ground.

trama The fleshy part of the cap beneath the cap cuticle and fertile spore-bearing layer of the gill.

translucent Transmitting light diffusely, semitransparent.

translucent-striate Appearing striate (lined) from the translucent quality of the cap, through which the gills show.

umbilicate (of the cap) Depressed in the center. See Diagram A.

umbo A knoblike protrusion in the center of the cap.

umbonate Having an umbo. See Diagram A.

uncinate A type of gill attachment. See Diagram B.

undulating Wavy. The cap margin of *Psilocybe cyanescens* is a classic example.

universal veil An outer layer of tissue enveloping the cap and stem of some mushrooms, best seen in the youngest stages of development.

variety A subspecies epithet used to describe a consistently appearing variation of a particular mushroom species.

veil A tissue covering the mushrooms as they develop. See definitions of partial veil and universal veil, and Diagram C.

ventricose Swollen or enlarged in the middle.

vinaceous Red-wine colored.

viscid Slimy, slippery when wet or sticky to the touch. In partially dried specimens, it is difficult to tell if the caps were once viscid or not. One test involves touching the cap against one's upper lip. If it sticks, this is a good indication that the cap was once viscid when wet. Typically used in reference to the cap texture. This feature is enhanced under moist conditions.

zonate Having a bandlike zone.

Recommended Reading and Resources

Books

To use this guide to its fullest potential, I strongly encourage you to consult some of the following books to broaden your understanding of mushroom taxonomy. To know only what the psilocybin-producing mushrooms look like, and to have no knowledge of their allies, is dangerous. The more you know, the safer mushroom hunting becomes.

Ainsworth, G.C. *Ainsworth and Bisby's Dictionary of the Fungi*. 8th ed. Kew, England: Commonwealth Mycological Institute, 1995.

Arora, David. *Mushrooms Demystified*. Berkeley: Ten Speed Press, 1986.

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Snell, Walter, and Esther Dick. *The Glossary of Mycology*. 2d ed. Cambridge: Harvard University Press, 1971.

Stamets, Paul. *Growing Gourmet & Medicinal Mushrooms*. Berkeley: Ten Speed Press, 1993.

Stamets, Paul, and J.S. Chilton. *The Mushroom Cultivator*. Olympia: Agarikon Press, 1983.

Mycological societies

Mycological societies are great resources for identifying mushrooms, as their chartered purpose is primarily educational. They coordinate mushroom forays and mushroom festivals, and often have extensive libraries. Furthermore, mycological societies are networked with one another and with poison-control centers. If you have any questions concerning the identification of a mushroom, feel free to contact them. Be forewarned, however, that some societies will be hesitant to help you identify a psilocybin-containing mushroom. However, they should at least tell you, if they know, whether a mushroom is truly poisonous or only psilocybian.

A national organization known as the North American Mycological Association (NAMA) coordinates activities with the local mushroom societies. This organization can refer you to a local society in your area, if present. NAMA also tracks mushroom poisonings and has set up a network of consulting physicians, versed in all aspects of toxic reactions, should one need to be consulted. NAMA has kept extensive records since 1984 in the form of a "Mushroom Poisoning Case Registry." This registry is made available to Poison Control Centers. The address is

North American Mycological Association
Mushroom Poisoning Case Registry
Blodgett Regional Poison Center
1840 Wealthy S.E.
Grand Rapids, Michigan 49506

Internet resources

General Internet Resource/Forum for Psilocybin Mushrooms:
hyperreal.com/drugs/psychedelics/mushrooms

Terence McKenna's home pages:
personal: http://www.levity.com/eschaton/tm.html
McKennaland: http://www.intac.com/~dimitri/dh/mckenna.html
McKennaArticles: http://www.nepenthes.xo.com/mckenna/index.html

Paul Stamets' home page:
http://www.halcyon.com/mycomed/fppage.html

Visionary Plants/Mushrooms:
ftp://www.nexchi.com/prv/vision/topics/interest/visionary/mushrooms/

(If you know of more Internet sites that should be listed, please e-mail me.)

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About the Author

PAUL STAMETS HAS BEEN STUDYING MUSHROOMS for more than twenty years, and has discovered and coauthored four new psilocybin mushrooms: *P. azurescens, P. cyanofibrillosa, P. liniformans* var. *americana,* and *P. weilii* nom. prov.

He runs a mushroom mail-order business, Fungi Perfecti, which grows and ships gourmet and medicinal (no psilocybin) mushroom products, and conducts in-depth workshops on mushroom cultivation. (For a catalog, call 360/426-9292 or fax 360/426-9377.)

His previous books include *Psilocybe Mushrooms & Their Allies, The Mushroom Cultivator,* and *Growing Gourmet & Medicinal Mushrooms.*