SPORE PRINTS

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THE SPLASH-CUP MUSHROOMS

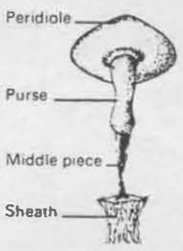
Terry Taylor

[*Mycofile* Vancouver, B.C., Mycological Society]

While on hiking and field trips I am often asksed about bird's nest fungi growing along the trails. The singular appearance of the small, symmetrical cups often attracts the attention of people with little interest in natural history, and can serve as a good introduction for the budding mycologist.

These fungi, in the family Nidulariaceae, are distantly qcrelated to puffballs, and the unusual shape is the result of adaptation to a novel mode of spore dissemination. Air currents are the principal means of dissemination for gilled mushrooms. Stinkhorns attract insect vectors such as flies. Hypogeous fungi depend on rodents. The bird's nest fungi, however, are splash cups. The sides of the cup amplify the force of falling raindrops. When a raindrop lands in a cup, much of its energy is transferred to the eggs at the bottom of the nest, and some of these may be carried well away from the parent fruiting body. The common name, bird's nest fungi, is quite appropriate, for they do look like small nests containing eggs. The spores are contained within these eggs, technically referred to as peridioles. The common liverwort, *Marchatia polymorpha*, also uses splash cups. Little green cups on the surface of the plant contain asexual buds which are spread in a similar way by rain. On rotten stumps there is a moss which also uses splash cups. The modified upper leaves of this small plant, *Tetraphis pellucida* often form shallow apical dishes, containing similar egg-like buds. This is quite a common species in coastal coniferous forests.

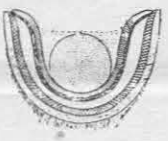
By far the most frequently seen of the Nidulariaceae in our area is *Nidula candida*. The shaggy, pale brown cups contain similarly colored peridioles. They grow on woody debris, and when present are usually in large numbers, demonstrating the effectiveness of the splash-cup mechanism for short distance dissemination. A related species is *Nidula niveotomentosa*. The fruiting bodies of this fungus tend to be more straight-sided, not flaring as much as *N. candida*. As the specific name indicates, the outside is usually white and woolly. It grows also on woody debris, and is frequently collected on old bracken stems, as well. The genus *Nidula* attaches its peridioles to the cup interior with a sticky, jelly-like substance.



Crucibulum laeve is sometimes seen on woody debris, also, but is much less common than *Nidula candida*. The white peridioles are attached by means of a thread, termed a funicullus. When splashed out, the funicullus often attaches the peridiole to surrounding vegetation. A couple of years ago a population of this species was brought in on a piece of wood. I took it home, keeping it on the back porch for a year, and the second year new cups fruited from the remains of the old ones. A similar species, with a funicular attachment, is *Cyathus striatus*. The Interior of the cup, however, is noticeably striate.

Another interesting bird's nest fungus worthy of mention is *Nidularia*, which also grows on a woody substrate. In this genus there is no cup. The nest has a thin wall, which disintegrates at maturity, releasing the peridioles.

In closing I would like to mention an interesting species from the related family Sphaerobolaceae, *Sphaerobolus stellatus*. The cups of this very small species possess star-shaped edges, and there is only one peridiole per cup. When mature, this peridiole is rapidly ejected, sometimes traveling several meters. This is accomplished by erosion of the surface layer inside the cup. The old cup lining remains on each fruiting body as a minute translucent bead.



Those who would like to delve more deeply into these fascinating fungi should look at Harold Brodie's *The Bird's Nest Fungi* or the Pacific Northwest Key Council's key.

WHAT'S IN A NAME?

Mycena News

New fungi are appearing in the markets which bear exotic and sometimes confusing names. To guide the curious shopper, the Mycological Society of San Francisco compiled the following list of some common names and their scientific equivalents.

Abalone Mushroom — species of *Pleurotus*.

Angel Trumpet — a tiny *Pleurotus* species.

Black Chanterelle — *Craterellus cornucopioides*.

Cremini, Crimini, Portobello/a, Italian Mushroom — expensive sounding names for brown strains of *Agaricus bisporus*.

Enoki, Enokidake — the immature spaghetti-like fruiting bodies of *Flammulina velutipes*.

Hedgehogs — *Hydnum repandum* or *Hydnum umbilicatum*.

Japanese Honey Mushroom, Hon-shimeji — a mushroom in the *Lyophyllum decastes* group. Despite the name, it is not related to *Armillaria mellea*, the honey mushroom.

Oregon White Truffle — *Tuber gibbosum*.

Oyster Mushroom, Tree Oyster — *Pleurotus ostreatus*.

Pom Pom Blanc, Bear's Head, Bear's Paw — *Hericium* species.

Shiitake, Black Forest Mushroom, Golden Oak Mushroom — *Lentinus edodes*. Few stores distinguish between shiitake grown on sawdust and those grown on logs, which are usually considered superior in taste and texture.

Spring Morel — *Verpa Bohemica*.

Wood Ears, Cloud Ears, Black Ears — species of *Auricularia*.

Yellow Foot — *Cantharellus tubaeformis*.

Spore Prints

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CALENDAR

Jan. 8	Membership meeting, 7:30 p.m., CUH
Jan. 20	Cultivation Group, 1:00 p.m., 8759 12th N.W.
Jan. 21	Board meeting, 7:30 p.m., CUH
Jan. 25	*Spore Prints* deadline
Mar. 15	Survivors' banquet, CUH

TREND OF THE FUTURE?

According to the San Francisco Mycological Society, the California Department of Parks and Recreation, which administers the state park system, has closed coastal state parks north of San Francisco to mushroom hunting. Formerly, picking or not picking was up to the discretion of the local park manager. Collecting in state forests is unaffected. According to the Mount Mazama Mushroom Association, Oregon has a similar policy in its state parks; mushrooms may also not be collected on any land designated a national park or monument.

Mycena News, the newsletter of the Mycological Society of San Francisco, has been chronicling the on-going battle of past MSSF president Larry Stickney with the East Bay Regional Park System. Incensed over a fine of $95 for picking chanterelles in Redwood Park, Larry was ready to go to jail over what he felt was a "misbegotten and unenlightened Park regulation." The judge disallowed that option in favor of a work program. Larry refused, and finally decided to pay the $95 after consulting an attorney. However, the court refused his check, and it appears Larry will have to go back to court once again.

The East Bay Regional Park District has not only forbidden individuals to pick mushrooms, but also declined to permit MSSF to arrange forays there.

Membership Meeting

Tuesday, January 8, 1991, in the Center for Urban Horticulture, 3501 N.E. 41st Street, Seattle

The title of this month's program is "Mushrooms in the Kitchen." Join chef Patrice Benson as she warms PSMS members and their guests with some of her favorite mushroom cookery. Patrice promises to demonstrate a few ways of preparing a mid-winter feast using either freshly cultivated mushrooms or some of your wild mushrooms harvested and preserved from some earlier season. This will be an especially good meeting for those of you with footlockers filled with dried morels and boletes and for those of you with boxes of Ziplocs filled with frozen matsutake and gypsies – and also for those of you who just want to see if people with footlockers of morels actually do exist. Punch will be prepared by Joy McKnight.

EAST VERSUS WEST—MEDICINAL DIV.

Andrew Weil
Condensed from *The Spore Print*, L.A. Myco. Soc.

Mushrooms have long been valued in the Orient for their nutritional and medicinal properties, but these virtues have mostly been overlooked in the West. Why this difference? One problem may be that most North Americans and many Europeans are fearful of wild mushrooms. This may be why antibiotics like penicillin have been extracted from lower fungi like bread molds, but larger fungi like mushrooms have been largely ignored. Physicians and scientists are as governed by personal biases as everyone else.

A second problem is the Western approach to medicine. The more specific the effect of a drug, the more orthodox Western medicine values it. The ideal is the "magic bullet": A drug that eliminates a specific unwanted physiological condition, preferably by acting via a fully understood physiological pathway.

Chinese medicine takes an opposite viewpoint. Drugs that do only one thing are the least valued; most valued are drugs that restore balance to the whole body. To Western medicine, a drug that does too many things – a "panacea" – is suspected of being merely a placebo.

A number of wood-growing mushrooms that have long been revered in the Orient have health-giving properties of the panacea type. These mushrooms produce polysaccharides of high molecular weight which stimulate the immune system.

Chinese researchers claim that a water extract of *Grifola umbellata*, given orally and by injection, is effective in combating lung cancer. Western researchers tested *G. umbellata* on cancer cell tissue cultures and declared it to be ineffective. Obviously something that works by stimulating one's immune system is not going to work when applied to an isolated culture of cancer cells. But Western science has a predilection for breaking things down into parts – in contrast to the Oriental approach of working with wholes.

An example of this predilection is the law on medical botanicals. The legal status of medicinal mushrooms in the United States is peculiar. Medicinal mushrooms and herbs are sold without any regulation – except that it is illegal to make medical claims for them. Before such claims can be made legally, present law says that every compound in the mushroom or plant must be tested and

proved safe. Since any particular mushroom or plant contains many dozens of compounds, many of which are unidentified, such testing is an impossibility. Fortunately, as has been done with the antibiotics produced by molds, it will probably be possible to make extracts from mushrooms and test those.

There needs to be a whole new category of FDA regulation for botanicals. At the same time that people should be stopped from selling botanicals based on patently false claims, the real, major medical benefits of botanicals should be researched, acknowledged, and promoted.

BEWARE, MUSHROOM RUSTLERS!

(AP) To the ranks of poachers, marijuana growers, and timber thieves, rangers in Oregon's forests can add a new foe – wild mushroom rustlers.

Matsutake mushrooms, which grow in the ponderosa pine forests of Oregon's Cascade Range, sell for as much as $40 a pound in Japan. With that kind of money to be made, those who are picking them illegally are armed and dangerous, rangers said.

"Many of the pickers out there, for whatever reason, are carrying handguns and...long knives," said Bill Reanier, agent in charge of law enforcement on the Winema National Forest. "The story we are getting out of them is they are doing it to protect themselves from other pickers who are out there trying to establish territorial rights."

Rangers have taken to wearing flak jackets and traveling in pairs through mushroom country.

This past picking season, rustlers descended in large numbers on both the Winema National Forest, where picking is legal with a permit, and Crater Lake National Park, where visitors are supposed to take nothing but pictures.

Rangers at Crater Lake seized 500 lb of illegally picked mushrooms and handed out 15 citations, said Chief Ranger George Buckingham. Fines range from $25 for someone picking for himself to $250 for those picking for profit.

Rangers at Winema National Forest handed out a similar number of citations to those caught picking without permits. Two pickers were also turned over to state police after computer checks revealed they were wanted for other crimes. Reanier said most of the problems seem to be caused by itinerant pickers who follow the mushroom harvest down the Cascades from Canada to California.

"We've got some pretty unsavory people coming from the Oregon coast and up in the state of Washington," he said.

Local buyers pay $10 to $14 a pound for top-grade matsutake, which are then resold in Japan, Reanier said.

"I talked to one buyer who said he had $50,000 in cash on him," he said.

Buckingham said rangers at Crater Lake stumbled on the problem last year while looking for deer poachers.

Now, Reanier said, mushroom rustling is approaching timber violations and pot plantations as one of the top crime problems of Oregon's forests.

He said authorities will need a plan of attack by next year's harvest season. "Quite frankly, this year we just got caught flat-footed," he said.

MUSHROOM & SMOKED DUCK SALAD **Kathy Casey**

This recipe is easy to assemble once you prepare all the elements, which you can do up to 2 days in advance. Served with a light soup such as Shrimp Wonton, it makes an exciting meal with a sprinkling of the orient.

2 bunches fresh spinach
1 tsp sesame oil
2 Tbsp vegetable oil
2 tsp fresh garlic, minced
1 C smoked duck or chicken, julienned (available at Seattle Super Smoke or smoke your own)
1 C matsutake mushrooms, oyster, or shiitake mushrooms, thinly sliced
1/2 C red and yellow peppers, julienned
3/4 C Sesame Honey Dressing (recipe follows)
1/4 C sliced almonds, toasted (optional)
Enoki mushrooms, for garnish (optional)

1. Wash and pick stems from spinach and drain well. Place spinach in large bowl.

2. In a saute pan, heat oils over medium-high heat until hot. Add garlic, smoked duck or chicken, mushrooms, and peppers. Saute a couple of minutes, then add Sesame Honey Dressing to tast). Stir well to heat, then pour over spinach. Add almonds and toss well.

3. Divide salad onto four dinner-sized plates and garnish with enoki mushrooms. Serve immediately.

Sesame Honey Dressing

1/4 C honey
1/4 C molasses
5 Tbs Dijon mustard
1/2 C sesame oil
1 C salad oil
3 Tbs cider vinegar
1/2 C rice wine vinegar
2 Tbs fresh ginger, minced
1/4 C sesame seeds, toasted
1/4 tsp Sambul Olek (opt.)
2 tsp kosher salt

In large bowl, place honey, molasses, and Dijon mustard. Whisk in slowly, vinegars and oils until emulsified. Whisk in ginger, sesame seeds, Sambul Olek, and salt. Bottle and refrigerate until needed. Shake well before using. Extra dressing can be kept refrigerated for up to one month.

THE FUNGUS

Harry Adams Knight
(Franklin Watts, Inc., New York, 1989).

(We couldn't resist the following book review by Mike Krapin, published in *Spores Illustrated*, the newsletter of the Connecticut Westchester Mycological Association.)

If you lie awake nights in dread of giant mutant fungi, do not read British author Harry Adams Knight's suspense thriller *The Fungus*. It will be your worst nightmare.

Laced with graphic violence, kinky sex, and mini-lectures on fungal lifestyles, this book will give perverse pleasure to mycophiles and make the uninitiated squirm.

In her London lab, a comely blonde mycologist isolates a virus-like artificial enzyme that controls mushroom size and growth rate. She intends to produce giant, protein-laden mushrooms to feed the world's hungry. Her first triumph is a modest 4-lb *Agaricus bisporus*, with a 2-ft long, 7-in. thick stipe and a cap 1 ft in diameter.

She celebrates the achievement with a night on the town, unaware that traces of superenzyme are trapped under her fingernails. In the process, she bumps into several people. They quickly become suffused with various species of fungal hyphae, and meet grotesque ends. I don't mean to spoil the reader's fun, but I can't resist revealing that one unfortunate beer drinker becomes a yeast bomb.

Fasten your seat belts. The mutation-causing enzyme is in the air. London soon succumbs to all manner of voracious fungi. Britain is quarantined. French ships and planes destróy anyone trying to cross the channel. A trio of unlikely characters undertakes a desperate mission to save the day.

Knight's writing isn't elegant, but it is effective. Here, for example, is his pithy description of an unlucky victim: "Dr. Bruce Carter's head was covered with a series of overlapping brown, crusty slabs that had the texture of tree bark."

I'm not sure the author's mycology is accurate. He doesn't capitalize genus names, for one. But even if he's wrong, it's tough to quibble at such marvels as a 6-ft *Phallus impudicus* with several birds stuck to its slimy cap, an attack by gleba bombs sprung from a field of *Sphaerobolus*, and a carnivorous fungus that spears its human prey's "writhing body," shoots him full of toxin to keep him quiet, and then feeds on his innards. The last example is followed by an anticlimactic, albeit instructive passage of scientific description, one of several Knight inserts into this fast-paced narrative.

The book's jacket notes, cryptically, that the author has done scientific research for both the private sector and the British government.

Mushroom lovers, don't wait for the movie. Read *The Fungus* for a bit of fun, then pass it on to your squeamish friends, the ones who always warn that no good can come from your peculiar hobby.

PERSONAL NOTES

Sick Call: Amelia Schultz is recuperating nicely from hip surgery. Past PSMS President Jenny Schmidt is in the Belmont Terrace Convalescent Home, 560 Lebo Blvd, Bremerton, WA 98310, and would welcome mail. Past PSMS President Howard Melsen suffered two heart attacks December 4th, but is recovering.

Mushroom Missionary: Dr. Joseph Ammirati was the Guest Mycologist at the Gulf States Mycological Society's "Harrison Foray", November 30 to December 2 at the Gulf Park Campus, University of Southern Mississippi in Long Beach.

Babies: Pacita and Guy **Roberts** are now the proud parents of a daughter, Kimberly Dana Roberts, born November 11th. Congratulations to Denise **Bigelow** on the birth of twin sons, Sean and Zachary, December 2nd.

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Nominations are open for the upcoming election!
See K. Hendricks, P. Benson, or I. Kleinman.