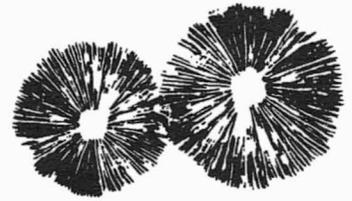


SPORE PRINTS



BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 348 January 1999

FROM THE PRESIDENT

Doug Ward

The topic of field trips was discussed at the December Board meeting with the hopes of introducing ways to make the field trips more accessible to the whole of PSMS. The following thoughts were put forward:

- a. Concentrate on day trips instead of overnights.
- b. Include one major Spring and Fall foray (overnight) at places like Lake Wenatchee, Lake Quinault, etc.
- c. Alternate the day trips on Saturday and Sunday (to accommodate those whose Saturday activities prevent attendance now).
- d. Arrange to have some day trips in the local area (Seward Park, etc.) so the travel burden is lessened for those without a way to make long trips.
- e. Change the Field Trip Coordinator so as to split up the tasks among more than one person.
 - i. Site Coordinator: arrange the times and places
 - ii. Host Coordinator: arrange for several hosts at each trip.

Your Board would like some feedback from the membership on these ideas. Nothing is decided for sure as yet. Please let us know by sending a postcard, leaving a phone message on the PSMS phone, or sending me an e-mail message at psmspres@aol.com.

PROMISCUOUS MYCORRHIZAE PROVIDE SCIENTIFIC TITILLATION

Bill Freedman

The Arizona Fun-Gi, via Duff, Newsletter of The Fungus Federation of Santa Cruz, March 1998

Investigators have begun to explore the many plant relationships to be uncovered under the surface of the soil. Most of us are familiar with "mycorrhizae" (MRZ), the mycelial threads which surround tree roots or invade plant cells to obtain essential sugars and to nourish the plants by supplying them with nutrients such as sugars, phosphorus, potassium, iron, etc. We have been impressed that soil fungi are frequently restricted to specific trees. Now we find that a single fungus can extend between different trees and help them by sharing what seems to be the fungus's food.

Finding mushrooms as they pop up out of the ground is easy. They are lovely to look at, some are tasty to eat, and they serve many beneficial life functions. If we study them, they can add to our knowledge and understanding of other living things. But the mushrooms we see are but fruiting bodies, like apples on a tree which is buried below the surface of the soil. It is more difficult to examine and understand the complexity of what is happening underground because we must apply chemical techniques and complicated instruments such as electron microscopes. The objects of our contemplation are seldom grossly visible and it may take some imagination to visualize what is happening.

Scientists have begun to apply systematic experiments and to study the chemical relationships between fungi and plants. What's new is that similar studies are being made between plants and plants. And it has been shown that fungi can act as intermediates in this exchange. So far, this pathway for sharing nutrients has been called "matting."

I've read two such articles. Carl Zimmer, winner of the 1997 American Institute of Biological Science Media award and senior editor for *Discover* magazine, discusses the intricacies of underground webs of life in the November issue of the magazine.

MRZ were rediscovered in 1881 when German botanists were sent to France to discover the secrets of growing Perigord truffles. The German public didn't want to pay the stiff import tariffs on highly favored black truffles. They wanted a share of the market. Professor A. B. Frank was assigned to bring suitable trees into Germany to develop a truffle industry.

Frustrated, he was unable to solve the mystery of why the most preferred ones chose to grow only in France. He became distracted by the challenge of explaining why tree roots were so altered in appearance and were so intimately associated with mycelia and truffles. He defined the MRZ state.

As you know, forest trees easily take carbon dioxide from the air and convert it by photosynthesis into sugars. Absorbing salts such as phosphorus, nitrogen and other chemicals essential for life from the soil is more difficult. Experiments done with radioactive isotopes of elements easily demonstrated the interdependent exchange of chemicals needed for the nutrition of both fungus and tree. Fungi can change the chemical nature of essential soil elements such as iron, making them available to the plant after special reactions take place in or around the fungus mycelia. Actually, it was a botanist named Kamienski who was first to discover, circa 1881, the presence of MRZ. All forest-litter White Indian Pipes (*Monotropa uniflora*) have no chlorophyll, and their source of carbon compounds like sugars was unknown. Kamienski observed their intimate association with beech tree roots, which were connected by mycelia to the Indian Pipe root-balls. Later, it was shown that the bolete, *Xerocomus*, acts as an intermediate in transferring radioactive chemicals from the tree to the Indian Pipes. This explains why Indian Pipe roots do not extend very far from the plant. All that is needed for their nutrition is to reach out and nibble on the tips of their endomycorrhizal fungal wet nurses. It has been estimated that the ability of a plant to find water and chemicals for growth is increased as much as 20,000 times with MRZ. *Xerocomus*, you see, can act as an Ecto- or an endo-MRZ.

Suzanne Simard, ecologist at the British Columbia Ministry of Forests in Kamloops, was able to follow the distribution of radioactive carbon isotopes between different kinds of trees. She grew birch and Douglas fir trees, covered them with plastic, and introduced gaseous isotope-labeled carbon dioxide, first to one tree and then the other. She observed that the labeled carbon was transferred to the other tree. Another experiment revealed that when one tree was shaded from sunshine, it accumulated more carbon

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PUGET SOUND MYCOLOGICAL SOCIETY

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Annual dues \$20; full-time students \$15

CALENDAR

- Jan. 12 Membership Meeting, 7:30 PM, CUH
Jan. 18 Board meeting, 7:30 PM, CUH Board Room
Jan. 23 *Spore Prints* deadline
Feb. 16 Booth setup, Northwest Flower and Garden Show,
Convention Center, 9:00 AM–NOON
Feb. 17–21 Northwest Flower and Garden Show booth,
Convention Center
Mar. 13 Survivor's Banquet, Edmonds Community
College

BOARD NEWS

Dick Sieger

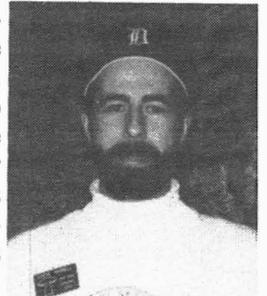
Education Chair Lisa Bellefond is planning a spring microscopy workshop and a fall *Cortinarius* workshop led by Dr. Ammirati and is working with Brian Luther to develop a program for training new PSMS identifiers. An investment committee including Dan Tanabe, Henry Lingat, and Ron Pyeatt is being formed. We gained 92 new members at the exhibit. Three volunteers are needed to co-chair the Field Trip Committee. One will be a site planner, one an equipment coordinator, and one a host coordinator. Field trips this year will be for one day, alternating between Saturdays and Sundays. PSMS will have a spring foray and a fall foray, perhaps at The Mountaineers Meany Lodge and Lake Quinault. The Seward Park outing led by Brian Luther was an outstanding success. The Election Committee is preparing its slate. The Survivor's Banquet will be prepared by the Culinary Arts Program at Edmonds Community College on March 13. The cost will be about \$30.00, and Bernice Velategui will be in charge of reservations. Lynne Elwell is in charge of the PSMS booth at the Northwest Flower and Garden Show and will enlist helpers at the January meeting.

MEMBERSHIP MEETING

Tuesday, January 12, at 7:30 PM at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle

We start off 1999 with Steve Trudell's fascinating lecture, "Mycorrhizae: What Are They and Why Should You Care?"

Mycorrhizae are ancient and vital symbioses, which do much more than provide chanterelles and matsutake for your table. Without them, there would be virtually no plant and animal life on this planet. Come find out what mycorrhizae are, what they do, why there's more to them than meets the eye, and why they are finally beginning to be noticed by increasing numbers of ecologists and environmental scientists.



Steve is a Ph.D. candidate in the Ecosystems Science Division of the UW College of Forest Resources. He has studied and photographed mushrooms for two decades and is currently conducting research on the role of mycorrhizal fungi in providing plants with nitrogen. Before returning to the UW, Steve served as a visiting faculty member at Evergreen State College, where he taught mycology, botany, geology, and soil ecology.

NEW MEMBER alert: This lecture contains information vital to your understanding of wild mushrooms!

Would persons with last names beginning with the letters H–O please bring refreshments for the social hour?

FLOWER AND GARDEN SHOW 1999 Lynne Elwell

PSMS will again have an information booth at the Northwest Flower and Garden Show held at the Seattle Convention Center from February 17–21, 1999.

A few people are needed to help set up the booths on Tuesday, February 16, from 9:00 AM–noon. Many more are needed to staff it during the show. Sign-up sheets will be available at the January meeting or call Lynne Elwell at (425) 885-5580. It's a lot of fun, and all who participate get to see the show for free.

THANKS TO OUR SUPPLIERS

Joanne Young

Thank you to our suppliers for their help on the 1998 Exhibit Poster. To Rolf Vecchi, owner of Qualigraphics, for an excellent printing job and for donating all the beautiful art reproduction paper for the poster. To the crew of Trademark Color Separations for their fine work preparing the film for the poster, and especially to owner Darrel Schmidt for the use of his computer system, and for the many hours of his patient assistance.

1999 SURVIVOR'S BANQUET

Steve Bell



Mark your calendars for the last Survivor's Banquet of the millennium, Saturday, March 13, at Edmonds Community College. The cost will be around \$30 each.

If you would like to be a part of the planning for this event, contact Steven Bell via e-mail at webmaster@psms.org or call (425) 788-8431.



ANCIENT FUNGAL MEDICINE

Dick Sieger

Men have died from time to time, and worms have eaten them, but not for love.
William Shakespeare

The Ice man was an early Copper Age man who died on a trek through the Alps 5,300 years ago. His well preserved body and equipment were found in 1991, frozen in an Italian glacier. Among the things he carried was a thong on which he threaded two pieces of *Piptoporus betulinus*, the birch polypore. Smoldering pieces of this fungus have been used to transport and start fires, and it was thought that the Iceman carried it for that purpose. New evidence shows that the fungus was likely used as a medicine.

An autopsy revealed that the Iceman's colon was infested with *Trichuris trichiura*, parasitic whipworms that cause acute stomach pain, diarrhea, and anemia. *P. betulinus* is an effective remedy. It contains antibiotic oils that act on some mycobacteria, resins that attack whipworms, and agaric acid which is a powerful laxative. Ingesting *P. betulinus* would have brought the Iceman relief by killing most of the worms and then purging his system of the worms and their eggs.

THE REAL STORY OF SANTA

The Spore Print,

Los Angeles Mycological Society, December 1998

Reindeer go crazy—literally crazy—for *Amanita muscaria*, the Fly Agaric, which the Lapp people traditionally used for its hallucinogenic effects.

Lapp shamans used to eat the mushroom during the midwinter pagan ceremonies of annual renewal. The first effect of eating it was a deep coma-like slumber. When the shamans woke the drug stimulated their muscular systems, so that a small effort produced spectacular results—the intoxicated person perhaps making a gigantic leap to clear the smallest obstacle.

The effect on animals was generally the same, and a mushroom-maddened super-reindeer traditionally guarded each shaman.

When Christian missionaries first reached Santa's native Lapland, they found a thriving pagan myth of reindeer flight. Rather than oppose it, they shrewdly assimilated the stories into the folklore of Christmas and Saint Nicholas. This then, is the true origin of the legend of Santa's flying sleigh.

The color scheme of his outfit is taken from the unmistakable red and white cap of the fungus. Lapps still scatter the mushroom in the snow to round up reindeer.



MUSHROOM PICKERS FACE DRUG CHARGES

The Spokane Spokesman-Review November 1, 1998
via *The Spore Print*, L.A. Myco. Soc., Dec. 1998

Longview, Wash. Six people were arrested on drug charges after authorities found a group of about 20 people harvesting hallucinogenic mushrooms from a pasture.

Police from Longview and Kelso joined Cowlitz County sheriffs officers Thursday morning at the field on private land near the city's new industrial park. "We started walking into the field and they didn't see us," said Longview Police Officer Jason Winker. "We were 10 feet away from two people before they noticed we were there, they were so intent on picking mushrooms."

The same thing happened when officers approached a second and third group in the cow pasture, Winker said. "They either didn't realize we were there or they didn't care."

Five men and one woman were booked into Cowlitz County Jail in lieu of \$5,000 bail. The others, who did not have mushrooms in their possession, were issued trespassing warnings.

"This pasture is well-known for its production of magic mushrooms," Winker said. "Now we're going to be all over it."

ELECTION COMMITTEE REPORT

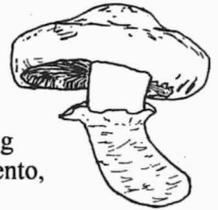
Dick Sieger

The election committee will present its slate and take nominations from the floor at the January meeting. This year, we will elect a Vice President, a Secretary, five board members, and three alternates. Any PSMS member may be nominated for any office but we hope that the people nominated have consented to run. Our society has traditionally encouraged newer members to become board members.

OREGON MATSUTAKE OFFER SLIM PICKINGS

Los Angeles Mycological Society, December 1998

(AP) Each fall, the matsutake season brings thousands of pickers to the forests of western North America. But in Oregon, at least, the 1998 season was not a happy one.



"It's the worst year I've ever had," said Dang Sandara, a picker and buyer from Sacramento, California. "There's just no mushrooms."

"The only place that I heard was fairly decent this year was in Canada," said Dan Nichols of Cave Junction, Oregon, who picks and buys matsutake. "If it's not the worst year, it's definitely within the top three worst years."

"It was too dry for too long there," said Mark Grant of Medford.

Buyers reported the nightly haul from the Illinois Valley in southwestern Oregon was typically just 50 lb. That compares to 600 to 700 lb a night in 1993, which was considered a poor year, and as much as 2,000 lb a night in good years.

"The average picker is probably making \$10 a day," said Grant, "and that's before paying for gas."

The mushrooms are typically shipped to Japan, where they can command high prices. But this year, with so few matsutake available, they were being sent to local markets in San Francisco and other West Coast cities, Nichols said.

MUSHROOM STUFFING

PSMS Cookbook

2 cups bread cubes	1/2 tsp salt
4 Tbs butter	Dash pepper
2 cups mushrooms, chopped	2 tsp poultry seasoning
1/3 cup dry onion, chopped Accent	

Trim crusts from bread. Cube. Lay on shallow pan and set in a 400°F oven until lightly browned.

Melt butter in a large fry pan and saute mushrooms until liquid evaporates. Add onion and cook until transparent. Add bread cubes and toss lightly. Add salt, pepper, poultry seasoning, and Accent. Makes 3 cups stuffing.

Mycorrhizae, cont. from page 1

isotope than another in full sunlight did. This indicates that the tree least able to manufacture sugar (because of reduced sunlight) was extracting more carbons (sugars) than the sunny tree. Since all the sugars are manufactured by the trees and the mushrooms are unable to make them, you can see that a fungal intermediate (species not identified) is used for the passage of the sugars. And the fungi sacrifice the sugars they withdraw from one tree for the benefit of the other tree.

Paper birch trees grow swiftly and shade nearby Douglas firs, which in their youth do not tolerate direct sunlight well. In this way, with the help of the MRZ, the birch trees are nourishing and protecting the firs. Other plants may also be transferring chemicals between themselves without the help of fungi—that is what “matting” is all about. Foresters remove “weed trees” such as the soft birches from stands of firs. In doing so, they have been interfering with the balance between these two species as they remove the shade needed by the fir trees for optimal growth.

Another brief note on recent studies of fungal soil relationships: Gary Lincoff from the New York Mycological Society spoke to me briefly about mushrooms that will not fruit in the absence of certain bacteria. When I obtain the data to review this, it will be reported in the *Mycena News*.

In the meantime, I remain a man, part of whose roots lie under the soil, contemplating how little we know of the intense warlike and cooperative activities taking place under our feet.

MUSHROOM MISSIONARIES

If you have done any mushroom missionary work, please notify the editor, so we can give you credit in Spore Prints.

Denis Benjamin gave a class at The HerbFarm on November 14.

Steven Bell identified 30 species of fungi for 40–50 people from the Food and Wine Association on a field trip led by **Jon Rowley** near Federation Forest on October 25.

Patrice Benson kept busy with various activities: Classes at The HerbFarm on September 13 and October 3; an all-day beginners' mushroom class for the Olympic Peninsula Mycological Society at Chimacum with **Dick Sieger** on September 19; a mushroom class for Les Dames d'Escoffier at CUH on September 28; PSMS Beginner classes on October 7 and November 4; Tall Timbers Forest Service mushroom survey October 16–18; a mushroom hunt and outdoor cooking demonstration with Jerry Traunfeld (auction donation) October 29; a mushroom cooking fund-raiser for Les Dames d'Escoffier November 14 with **Lynn Phillips**; a culinary arts lecture at North Seattle Community College November 18; and a culinary arts lecture at Seattle Central Community College November 19.

LOOKING AHEAD

The Maine Mycological Association will be hosting the next Northeast Mycological Foray on Labor Day weekend 1999. Details are as follows:

NEMF 1999: Fifth Annual Samuel Ristich Foray
Hosts: Maine Mycological Association
Place: Sugarloaf USA, Carrabasset Valley, ME
Time: Friday, Sept. 3 to Monday, Sept. 6, 1999
Chief Mycologist: Dr. Alan Bessette
Contact Persons: Linda and Clayton Clarke
56 Quebec St., Portland, ME 04101
telephone: 207-772-4014
e-mail: CClarke1@maine.rr.com

Sugarloaf, best known as a ski resort, is in the western mountains of Maine, 90 miles from Augusta, 110 miles from Bangor, 125 miles from Portland, 225 miles from Boston, and 435 scenic miles from New York City.

The largest white truffle found in 1998 is on display at the Mark Hotel, 77th Street and Madison Avenue., New York City. It weighs 1 lb, 9½ oz and is worth \$6,000.

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