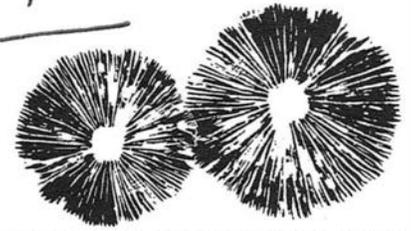


SPORE PRINTS

KEEP



BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY

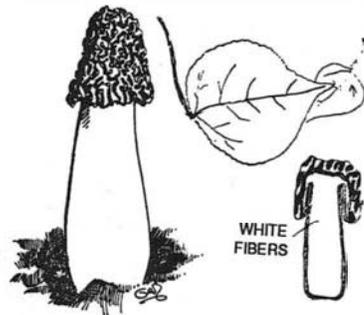
Number 270

March 1991

COMING UP, THE FIRST FIELD TRIP OF THE SPRING

Our annual introduction to the spring season, the learning field trip to MacDonald County Park, is scheduled for Saturday, March 23. MacDonald Park is located on the Tolt River about half a mile south of Carnation in King County. Enter the park on N.E. 40th Street from State Hwy. 203. Watch for PSMS signs on the corner. Use the day-use parking lot and cross the suspension bridge to the shelter.

There will be a short lecture at 9:00 a.m., followed by a foray for *Verpa bohemica* under the cottonwoods in surrounding areas. Wear shoes suitable for soggy ground and bring your rain gear. For your mushrooms, bring a container with a wide bottom (not a plastic bag).



There will be coffee and goodies at the shelter. Bring a sack lunch. The trip ends around noon.

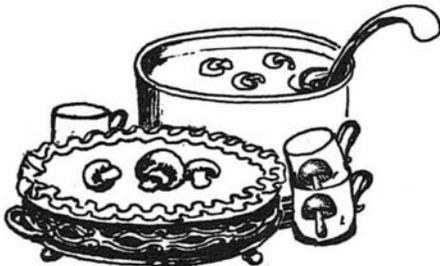
SURVIVORS' BANQUET

Patrice Benson

The 28th annual survivors' banquet is quickly approaching! This is a reminder to get your tickets promptly for this wild occasion. The deadline for tickets is March 10. Please send \$14.00 for each reservation, along with entree choice of meat or vegetable, and kindly inform me of your potluck selection of salad or appetizer. Those who volunteered to help with this undertaking will be contacted by the chairman with a specific task. If you haven't been called, please phone me. Patrice Benson, 3818 Cascadia Ave. S., Seattle, WA 98118, phone 722-0691. If anyone has taxidermic items (moose, elk, deer heads) for loan for the evening, please phone me. I am also in need of a couple of old-fashioned electric covered roasters for heating stew.

Inga and Magda will be decorating and have requested mushroom memorabilia to be donated for door and table prizes. These items may also be used for decorating. Please phone Inga at 525-3522 for details.

On the night of the banquet, please remember to wear your name tag. We will be B-U-S-Y and crowded in the kitchen, so your potluck donation should be ready to serve on a serving piece with your name on the bottom for retrieval afterward. Take your item to either the salad table or the



appetizer table. These tables will have a host to receive and situate your creations. Don't forget to bring your own wine or beer if desired. There will be some nonalcoholic choices provided for the attitude-adjustment period. Please wear your mushroom jewelry, ties, or whatever. The theme is "The Hunter." Denny Bowman has got something up his sleeve as concerns the program. Perhaps we'll all be surprised.

See you at 7:00 p.m., Friday, March 15, at the Center for Urban Horticulture at 3501 N.E. 41st Street.

MUSHROOM USZKA

Patrice Benson

1 C duxelles made with any type of mushroom
3 doz wonton wrappers or homemade pasta dough
6 C broth
Salt, pepper, herbs to taste
1 to 2 C shredded greens (cabbage, spinach, sorrel)

Place 1/2 Tbs duxelles on wonton wrappers or pastry dough; seal with water. Boil uszka for 2-3 minutes. Gently heat broth and add boiled uszka. Season and add greens. Serve hot.

Pasta Dough

3 C flour
1 C milk, cream, or 1/2 cream and 1/2 sour cream
1 egg
2 oz butter

Melt butter in heated milk. Add egg to well made in center of flour. Pour hot milk into flour and mix until smooth. Cool and rest 20 minutes. Roll dough 1/8 in. thick. Cut 2 in. diameter circles or squares. Place filling on upper half of each piece. Fold opposite edge over filling and seal with a little water. Bring pointed edges together and seal.

DUXELLES (MUSHROOM CAVIAR)

Patrice Benson

2 large minced shallots or
1/2 C chopped onion
2 oz butter
3 C chopped mushrooms
Salt and fresh ground pepper to taste

Options: 1/2 C cream
1/2 C sour cream
Chopped chives
Chopped parsley
1/2 tsp paprika
Chopped dill or savory
2 Tbs cognac or brandy

Heat pan, saute shallot or onion slowly until limp, remove. Saute finely chopped mushrooms until liquid is reduced. Add shallot, salt and pepper, and any optional ingredients. Stir fry for 2 minutes to blend flavors. Put into a small pot or bowl and chill. Serve with plain unsalted crackers or crusty bread. A nice touch would be a garnish of a whole fresh mushroom.

Spore Prints

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PUGET SOUND MYCOLOGICAL SOCIETY
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CALENDAR

March 4	Beginners' class, 7:00 p.m., Isaacson Hall, CUH
March 11	Beginners' class, 7:00 p.m., Isaacson Hall, CUH
March 15	Banquet, 7:00 p.m. (social hour, 6:30 p.m.), CUH
March 17	Cultivation Group, 1:00 p.m., 8759 12th Ave. N.W.
March 18	Beginners' class, 7:00 p.m., Isaacson Hall, CUH
March 18	Board meeting, 7:30 p.m., CUH
March 22	<i>Spore Prints</i> deadline
March 23	Learning field trip, 9:00 a.m., MacDonald County Park, Carnation
March 25	Beginners' class, 7:00 p.m., Isaacson Hall, CUH
April 2	Beginners' class, 7:00 p.m., Isaacson Hall CUH

BOARD NEWS

Agnes Sieger

Elizabeth Hendricks and Dennis Bowman will be in charge of publicity for the fall show. The Carnation field trip will be March 23. The beginners classes will begin on March 4 and run for 6 weeks. The classes are already filled. The board minutes will be posted at the membership meetings for a while to see if anyone is interested. Dennis Bowman reported on his investigation of video technology. The state-of-the-art appears to be 8 mm. The Board voted to buy an 8 mm camera for its better resolution and ease of editing, but to provide VHS copies for members to use on their current machines. We will also buy a couple of table-sized tarps for the field trips.

Membership Meeting

The meeting this month will be held during the Survivors' Banquet on Friday, March 15, at the Center for Urban Horticulture, 3501 N.E. 41st Street, Seattle

Bring your salad or appetizer and beer or wine, if desired, and enjoy this unusual and joyful occasion. Don't forget to wear your name tags and mushroom adornments. The festivities begin at 7:00 p.m. Bon appetit!

MEET THE IDENTIFIERS

Inga Wilcox

Is there anyone who does not know George Rafanelli? Today we will learn a bit more about him. George is a native Washingtonian, having been born at Kanasket, east of Kent. This June 20th, he will celebrate his 75th birthday. George and his family moved to Seattle in 1918, and he started school at Maple Hill, where Cleveland High School was built later on. The last four years of grade school were spent at Cedar Falls, long a good chanterelle area until it was recently logged off. Having finished high school in West Seattle, George joined the Navy in 1934 and after 20 years transferred to inactive duty. In civilian life, he worked as a refrigeration mechanic and control technician at the Bremerton Naval Shipyard, at Pier 91, and later at the University of Washington, retiring in 1978.



As a little boy George went mushrooming with his family and continued doing so. When he left the Navy, he wanted to know more about the mushrooms he was collecting and started studying in earnest, on his own. When he heard about the formation of the Puget Sound Mycological Society, he promptly joined as a charter member. George has greatly enjoyed his association with the Society and has contributed much. He has served on the Board, as Vice-President, and as our third President. He has chaired the Field Trip Committee and the Education Committee. He was instrumental in creating the freeze-dry exhibit, and, of course, we all know him as an identifier at forays. In addition, George is a Society speaker, enlightening members of garden clubs, business groups, or the Kiwanis about the world of fungi. Besides his work in the Society, he has served on the Northwest Key Council. His name is on the list of identifiers at the Poison Control Center. George is called to help identify sources of mushroom poisonings (often in the wee hours of the morning) and can tell us many stories—usually with a happy ending for the victims.

Asked about the growth of the Society from its charter days in 1964 to now, George said he feels that persons join our Society in order to participate and to study, and that the Society enjoys good programs and good leadership. As for himself, George enjoys the study of fungi best.

At the 25th anniversary Survivors' Banquet, George entertained us with a song about fungi, set to the tune "The Best Things in Life are Free." Could this be our Society song? As for continuing along the mushroom trail, he says, "As long as the red wine flows, you will run into me out in the hills."

Grazie mille, Giorgio!

FOOD POISONING FROM CANNED MUSHROOMS

[Pamela Hardt-English, George York, Richard Stier, and Peter Cocotas in *Food Technology*, December 1990]

At least four outbreaks of staphylococcal food poisoning, involving more than 100 people, occurred in the United States in 1989 as a result of eating canned mushrooms from the People's Republic of China. Staphylococcal enterotoxin was found in mushrooms from eight canneries in five provinces. Because of these outbreaks, the U.S. Food and Drug Administration placed all mushrooms imported from China on automatic detention.

Canned foods are rarely implicated in staphylococcal poisoning. How did it happen this time? And were there ways to prevent it from happening again?

Nature's Farm Products, Inc., Hayward, California—the leading importer of canned mushrooms from mainland China—retained the authors to find the source of the outbreak, present their findings to the FDA, and recommend corrective steps.

Staphylococcal poisoning results from consuming an enterotoxin produced by the organism *Staphylococcus aureus*. One of the three most common types of food poisoning, it is usually associated with cooked, protein-containing foods which are contaminated after cooking and allowed to remain at room temperature for several hours. Meats, potato salads, and cream-filled pies are common offenders. Usually, the product is contaminated via food handlers: *S. aureus* is found on the skin and in the nasal passages of 30%-50% of the population.

Staphylococcal toxins seldom occur in canned foods because the organism is easily destroyed by heat. Also, it is a poor competitor, usually flourishing only where competition has been eliminated, e.g., by cooking or salting. For canned mushrooms to be contaminated, (1) the raw mushrooms would have to be contaminated with the organism and exposed to time and temperature abuse sufficient to allow toxin production before canning (the toxin is heat resistant), or (2) the cans would have to be contaminated after processing—via poor handling and leakage. Although theoretically possible, both these conditions are highly unlikely.

What, then, was happening in the mushroom growing, transportation, and processing systems that was allowing this organism to flourish and produce toxin?

Our investigation focused on Fujian province, which accounts for about 80% of all production. Mushroom growing in Fujian occurs in the cool season (November to March), because no refrigeration is used in growing or transport. Growers for the most part are collectives within 50 to 80 km of the plant. The mushroom spawn is uniform and under government control, as are growing and composting conditions. Mushrooms are grown exclusively for canning, which accounts for the high quality of Chinese mushrooms; unlike in many countries, they are not rejects from the fresh market. They are picked each morning, packaged in high-density polyethylene crates, and delivered by unrefrigerated truck to the local plant, where they are processed soon after arrival.

Our survey revealed no *S. aureus* in compost or on raw mushrooms, nor any unacceptable sanitary practices likely to foster its growth. A survey of plant facilities did turn up traces of the organism on workers' hands, but did not reveal the presence of toxin, nor conditions in which staphylococcal would grow and produce toxin.

A review of the previous year's production records, however, revealed a possible clue. When agriculture in China was decentralized to encourage private initiative, speculators from other provinces and Hong Kong began

buying mushrooms, causing plants to lose their local supply. Rather than being shipped 2 to 4 hours from known sources, mushrooms at that time were being bought from brokers and shipped over days. During transport, the mushrooms were packed in 20 kg, tied-off, nonperforated polyethylene or PVC bags. We speculated that oxygen and carbon dioxide were not permeating these bags fast enough to keep up with the rapid respiration rate of the mushrooms.

At 20°C, mushrooms respire 158 cc of oxygen per kilogram per hour—3160 cc/hour for a 20 kg bag. The calculated permeability for the 20-kg bag employed was only 21 cc/hour at steady state. As a result, oxygen would become depleted and carbon dioxide elevated until an equilibrium was reached. If the high carbon dioxide level killed off the normal spoilage organisms, conditions might exist where *S. aureus* could grow without natural competitors.

To test this theory, we inoculated fresh mushrooms with *S. aureus* cultures and placed half in tightly sealed polyethylene bags and half in vented plastic crates without bags. As a control, uninoculated mushrooms were also packed in both bags and crates. Both samples packed in plastic bags, inoculated and uninoculated, developed staphylococcal toxin within 48 hours. Both samples packed in the crates were negative. Within 4 to 6 hours, oxygen in the plastic bags dropped to 2-3%, and carbon dioxide rose to approximately 20%.

Even though mushrooms in plastic bags may develop staphylococcal toxin, they may still appear acceptable. The toxin does not adversely affect the appearance or odor of the product, and the other aerobic organisms that would normally do so are eliminated by the carbon dioxide. In addition, carbon dioxide retards shriveling of mushroom caps and opening of veils, two important indicators of quality.

We presented our findings to the FDA and instituted a quality control system to prevent reoccurrence of the problem. In 1990, the FDA allowed shipments from certain Fujian plants, although all mushrooms from the People's Republic of China are still under the automatic detention provision.

The problem—although seemingly unique to China—has implications for processors throughout the world. Unilateral changes to the food distribution chain without understanding all the consequences—from harvest to consumer—and their combined effect on product safety may result in other unwanted surprises.

COURSES, ANNOUNCEMENTS, NOTES OF INTEREST

Bring Back Your Slides: If you have any slides or books checked out from the PSMS library, please bring them back as soon as possible so we can run an inventory.

***Mushrooms Demystified* is back in print.** Phone Elizabeth Hendricks, 284-2164, for orders.

PSMS Beginners' Classes: The beginners' classes will meet every Monday, starting March 4th, at 7:00-9:00 p.m. in the Isaacson classroom at CUH. Cost is \$15 or \$3.00 each for individual classes.

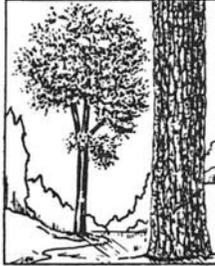
Eastern Mushroom Course: July 8 - 19, 1991, Professor Ron Peterson of the University of Tennessee will give a two week course on fungi of the southern Appalachians. Housing available, college credit if desired. Geared to beginners, with more advanced work the second week. For information, write Dr. Richard Bruce, Highlands Biological Station, P.O. Drawer 580, Highlands, NC 28741.

THE "EARLY MOREL"

Agnes Sieger

Before long, we will hold our annual pilgrimage to the Tolt River to pay tribute to the first mushrooms of the coming season, *Verpa (Ptychoverpa) bohemica*. Not the choicest of mushrooms, maddeningly hard to spot amid the debris of the previous fall, sometimes causing severe reactions in its consumers—but the first! The sign that all is again right with the world, that mushroom bounty will follow mushroom bounty until next summer.

Often called the early morel because of its timing and superficial resemblance to the true morels, *Verpa bohemica* fruits from late February through April, depending on the season. In the Pacific Northwest, it is associated with cottonwoods, often fruiting right around the drip line of mature trees "when the cottonwood leaves are the size of a mouse's ear." Once you learn to recognize the cottonwood, a tall, dark, poplar-like tree with wrinkled bark that grows in damp river bottoms throughout western Washington, you can spot your hunting ground from afar. Finding your quarry, however, isn't that easy.



The first time my husband and I went *Verpa* hunting, we spent an entire day scouring the leaf cover beneath the cottonwoods in a flood plain near Rockport without catching so much as a glimpse of a mushroom. Finally, half an hour before sundown, we spied something suspicious peeking up through the debris around the tree roots. Our first *Verpa*. After that, we spotted a few more, and then some more. We had undoubtedly been walking over hundreds all day.

Verpa bohemica is a medium sized (3-8 in. tall), tanish mushroom with a wrinkled, bell-shaped cap which is attached only at the top, forming a skirt over the stem. The stem is long, at first whitish to cream in color and becoming tan with age, and filled with cottony fibers.

In contrast, true morels have pitted, not wrinkled, caps that are attached to the stems at the bottom (or in

some cases part way up); their stems, while hollow, are empty.

Unlike other *verpas*, and most other large ascomycetes, *Verpa bohemica* has only two spores per ascus instead of eight. For that reason, modern taxonomists have split it into its own genus, *Ptychoverpa*. What each ascus lacks in numbers, however, it makes up for in size; microscopically speaking, the spores are huge.

Although considered a good edible by many, this mushroom causes gastrointestinal upsets and loss of muscular coordination in some people and should be approached with caution. Many field guides recommend parboiling it and throwing away the water and eating only small amounts at a time. The effects may be cumulative, so don't pig out on it several days in a row, even if it is the only edible mushroom out at the time.



THANKS

Bryce Kendrick

To PSMS Vice-President Dennis Bowman
From our November speaker, Dr. Bryce Kendrick

Thank you for making such excellent arrangements for me; everything worked out beautifully. I am very impressed by the number of members your Club has, and I was very pleased to have such a large turn-out. It was the largest audience I have spoken to since the International Mycological Congress in Regensburg earlier this Summer. I was delighted with the calibre, as well as the size, of the group. They were most receptive. It was a pleasure to meet such keen people: surely your annual show, the magnificent coloured posters that accompany it, must be among the best anywhere. You are all to be complimented (and envied for having access to so many fine mushrooms).



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Center for Urban Horticulture
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RAFANELLI, George & Jennie
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Last Chance for Banquet Tickets, March 10!