

SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Monroe Center, 1810 N.W. 65th St., Seattle, WA 98117

November 1986

Number 226



AMANITA VERNA POISONING

Agnes Sieger

In early October, a Seattle man was seriously poisoned by what he thought was a matsutake (*Armillaria ponderosa*) which he had gathered in the Lake Kachess area about a mile north of I-90. Approximately five hours after cooking and eating the greater part of the mushroom, he suffered stomach cramps and subsequently displayed other symptoms of amatoxin poisoning. After making himself throw up (and having the presence of mind to save the results), he was hospitalized and placed on dialysis, but lost all kidney function and also suffered liver damage. At last report, his kidney function was back up to 11%-15%.

Professor Joseph Ammirati, PSMS scientific advisor, examined the vomitus, but because of the delayed onset of vomiting, little mushroom tissue was found except, perhaps, a few spores. From a slice of the mushroom, with gills attached, that the victim's family dug out of the garbage, it was determined that the fungus had amyloid spores (i.e., spores that turn blue in iodine solution), a feature of the subgenus *Lepidella* which includes the deadly *Amanita* species. The mushroom that caused the poisoning is most likely *Amanita verna*.

This is the first known poisoning in Washington from an amatoxin-containing *Amanita*, species of which are uncommon in our state. Species of *Galerina* such as *Galerina venenata* and species of *Lepiota* such as *Lepiota helveola* (rare, but collected in Seattle within the last month by Dr. Sundberg during his recent visit here) also contain amatoxins, and both have caused poisonings in Washington. *Galerina venenata* and *Amanita pantherina* are the only two mushrooms known to have caused fatalities in humans here.

Although amatoxin-containing Amanitas are uncommon in Washington, they are by no means unknown. *Amanita verna* has been collected previously on a PSMS field trip to Crystal Springs, which is near Lake Kachess, and Dr. Hosford of Central Washington University, Ellensburg, knows of collections in the same area. It is also reported from Vancouver, Washington, and from as close to Seattle as Woodinville. For the past several years, Ben Woo has been collecting *Amanita phalloides* regularly in the Mount Baker district in Seattle. (He brought in a large collection for display at the recent PSMS exhibit.)

Many unusual mushrooms are showing up this year. Perhaps because of the generally sparse fruiting of our common fungi, things that would ordinarily go unnoticed are tempting a second glance. Not finding your favorite mushroom is frustrating; eating a misidentified one could be fatal.



Anyone, PSMS member or not, can receive help identifying mushrooms by calling the Society (783-4943) or one of the identifiers, denoted by a double asterisk next to their phone numbers in the PSMS roster.

WATLING WILL SPEAK AT UW

Agnes Sieger

Mycologist Dr. Roy Watling, Edinburgh, will speak at the University of Washington on November 4th. The lecture will begin at 7:00 p.m. in the first floor auditorium of the new botany building, Hitchcock Hall. Hitchcock Hall is the new structure with the long concrete ramp just east and south of the intersection of 15th Avenue N.E. and N.E. Pacific Street.

That late in the evening, some parking should be available on the streets just west and south of there; parking is also available for \$1.25 (one person per car) or 25 cents (three or more persons per car) in the UW lots just south of the botany building. Go to Gate 6, south of Pacific on 15th N.E., and explain your desire to the attendant.

Dr. Watling (BSc, PhD, M.I. Biol.) is Principal Scientific Officer, Royal Botanic Gardens, Edinburgh, Scotland. Among his many books and articles, Dr. Watling has published *Identification of the Larger Fungi, British Fungus Flora: Agarics and Boleti, A Literature Guide for Identifying Mushrooms* (with Elizabeth Watling), and *What Happens as a Mushroom Mushrooms, Studies by Roy Watling*.

NAMA FORAY, PRIEST LAKE, IDAHO

Agnes Sieger

In spite of the omnipresent drizzle, nothing dampened the enthusiasm of the 278 registered members from 32 states, Canada, and England who attended the 20th annual North American Mycological Association foray. The rains would have been more welcome if they had begun several weeks earlier. As it was, harried field trip chairman Ken McCain of the Spokane Mushroom Club had to scurry far and fast to come up with likely hunting grounds for all who took to the woods seeking the fabled fungi of the Pacific Northwest. Four NAMA forays have been held in Northern Idaho, with the species count ranging from 231 to 403.

As PSMS representative to the NAMA board, which meets before the foray, Coleman Leuthy reports that NAMA currently has 1473 members and 36 affiliated clubs. NAMA issues two publications, the periodic typeset *McIlvainea* and the more informal bimonthly *Mycophile*. It currently maintains 17 sets of slide programs on various aspects of mycology, plus sets of NAMA photo contest winners. During the past year, 143 slide programs circulated to 24 states. It operates a "Mushroom Watch" to keep track of annual conditions throughout the U.S. and maintains a toxicology committee which, besides presenting a toxicology program at each annual foray, compiles an annual reference list of toxic mushrooms, maintains a case registry of mushroom poisonings (143 for the year ending June 30, 1986) and compiles and distributes information in the scientific literature. It also has a speakers bureau manned by 38 volunteers.

Each year's foray is held in a different region of the country. Next year's will be near New Orleans.



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Spore
Prints

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Calendar

- Nov. 1,2 Field trip (cancelled)
Nov. 4 Dr. Watling lecture, 7:00 p.m.,
Hitchcock Hall, UW
Nov. 5 Intermediate class, 7:00 p.m., Room 104,
Monroe Center
Nov. 8,9 Field trip to Deception Pass
Nov. 10 **Membership meeting**, 7:40 p.m.,
Monroe Center auditorium
Nov. 17 Board meeting
Nov. 21 *Spore Prints* deadline

FIELD TRIPS

Andy Green

November 8, 9 Deception Pass
To reach Cranberry Lake Shelter in Deception Pass
State Park on Whidbey Island, take exit #226 from I-5
and go west on Route 536, which becomes Route 20.
Turn south, away from Anacortes and toward Whidbey
Island. Cross Deception Pass, take first right into
the park, and follow PSMS signs.

See you in the woods in the spring.

Membership Meeting

Monday, November 10, 1986, at 7:40 p.m. in the Monroe
Center auditorium, 1810 N.W. 65th Street, Seattle.

Application and use of identification keys to genera
will be the subject of discussion by our November
speaker, Gene Butler, of Chehalis, Lewis County,
where he is founder-organizer of the Lewis County
Mushroom Society. Butler, author of the 1978 volume
Keys to Mushroom Genera, is a lifelong Washington
State resident who is also past president of the
Pacific Northwest Key Council and a member of the
North American Mycological Association. He presently
is Deputy Prosecuting Attorney in Lewis County. A
former resident of Snohomish County, he was an orga-
nizer of the mycological society there, and for two
years taught mushroom identification at Everett
Community College.

This time only, because of the orientation class, the
meeting will start at 7:40 or 7:45 p.m. Please show
consideration for those listening and Hildegard, who
will be lecturing, by remaining in the the back part
of the auditorium until the orientation is completed.
(Feel free to join quietly and listen if you wish.)
The book sales and membership desks will not be open
until after the orientation.

CRYSTAL SPRINGS FIELD TRIP

Andy Green

Fall field-trippers were off and hunting on their
first foray before our little fungus friends had
benefitted from the required three major fall rain
soakings. Despite the early date and dry conditions,
Charlie Volz and Brian Luther were able to identify
over 100 species before darkness set in. Edibles
were not found in any abundance.

Sixty-two people signed the register, and 26 enjoyed
a lovely pot luck dinner. Hosts were Larry and
Darlene Baxter and Andy Green.

MASONIC PARK FIELD TRIP

Lyle and Joy McKnight

September 27th and 28th turned out to be wet and
cool, good mushroom hunting weather. And the hunting
really was quite good in spite of the long dry peri-
ods we've had. Fifty-nine species were identified
by Brian Luther. Monte and Hildegard Hendrickson led
a party over the river and up the hill a mile or so,
where almost everyone found a good supply of chanter-
elles. Fifty-eight people signed in for the field
trip, with 36 staying to enjoy the pot luck, which as
usual was outstanding. Thanks to Grace Maloney and
her daughter for helping co-host. It was a good day.

SODA SPRINGS FIELD TRIP

Coleman Leuthy

Thirty-eight people signed in for the field trip,
including the hosts, PSMS Treasurer Edith Godar,
Marie Guillas, past PSMS president Jack Orth, and his
wife, Navarre. Coming the farthest may have been Ken
and Emma Chaplin, who live in Sequim and seldom make
it to the field trips. Because of a Mountaineers
field trip the same weekend, the main identifier
(yours truly) didn't arrive to identify until about
4:00 p.m., but Dick Sieger and others helped out ably
with the i.d. At least 110 species of mushrooms
were observed, within 40 genera.

Dick reports that early birds who hiked to higher elevations were rewarded with some white chanterelles, *Cantharellus subalbidus*. A good assortment of boletes arrived at the display table, but collectors gathered few *Boletus edulis*, and matsutake and yellow chanterelles remained well hidden in the forest. The only matsutake found may have been the one earlier in the day by a Mountaineer.

In the nonedible department, the consistency of nature was reaffirmed by the appearance of the faithful *Polyporus squamosus* and *Lentinus lepideus*, which haven't missed a field trip here yet.

EAGLE CREEK FIELD TRIP Coleman Leuthy

The field trip at my cabin, "Mountain Maple," near Leavenworth, was attended by 26 people. Dorothy Tarr and Darlene and Larry Baxter joined me Friday for an enjoyable evening, and at least 10 people stayed over Saturday night. Millie and Irwin Kleinman served as hosts, and Brian Luther identified, assisted by his small son, Zachary. Even though it was still somewhat dry, we counted 70 plus species.

Those who attended reported that they thoroughly enjoyed the field trip, and I thoroughly enjoyed having them.

PRESIDENT'S MESSAGE Coleman Leuthy

Congratulations to the exhibit committee on a great show with mycophagy as a new attraction, to the organization committee on their fine work, and to the many unseen workers who were invaluable in equipment transportation and setup, sorting, identification, ticket sales, the kitchen -- and especially in the clean-up.

I would like to emphasize that all bills for the exhibit need to be submitted to the board, through Dennis Bowman or Caroline Irvin, by the board meeting on November 17. All expenses for 1986 need to be approved for payment by the December board meeting on the 15th. Receipts other than those for previously approved ongoing expenses for 1986 will be considered void if not presented and paid by December 31, 1986. This is necessary so that our treasurer can close the 1986 books.

On a related note, I feel we need to know more clearly what people are spending. I have asked chairpersons to keep their own budgeted expense and income ledgers. All expenditures and income should go through the chairperson of the committee involved, and workers on those committees should have permission from their chairperson to spend a specific amount before doing so. Other expenditures may not be approved. Committees with ongoing expenses may accumulate them. Bills for annual or one-time-only events should be submitted no later than the second board meeting after the event.

Back on the social side, even though the December slide show has been postponed until January, the annual cookie and punch social is still scheduled for December, after the program. It's not too soon to start thinking about preparing your favorite cookies and getting ready for this annual epicurean delight. Martha and Art Benny have again graciously consented to help organize it. They need your support so, as before, plan to give assistance. See the December *Spore Prints* for more details.

BEGINNERS' CLASSES Coleman Leuthy

Nov. 4: For this session, we will attend the lecture by Watling at the U.W. Nov. 11: We will complete discussion of groups of mushrooms and review common edible and poisonous fungi.

ORIENTATION CLASS Hildegard Hendrickson

Auditorium, Monroe Center, 6:30 -7:20 p.m. Joined PSMS within the past year? Come and learn about your club and its activities: general orientation, history, field trips, how to collect and when to hunt mushrooms, and a briefing on cooking, drying, and using them.

1986 EXHIBIT Dennis Bowman

Over 2000 visitors packed the Monroe Center this year for our 23rd annual exhibit. Cooking was very popular with the crowds, as chefs from five of Seattle's best restaurants shared their art of mushroom cookery; a good taste was had by all.

Through the efforts of Caroline Irvin and Pacita Roberts, we had exceptional publicity, including visits by five TV stations during the exhibit itself. Book sales were brisk, and our beautiful posters were a popular item. During much of the exhibit, the identifiers were kept busy by lines of visitors carrying bags full of mushrooms to be identified. Although the species count is still being made, Helena Kirkwood says about 280 kinds of mushrooms were collected and displayed.

Many thanks to the helpers who worked so hard this year. Because of them and all of you, the exhibit was a great success.



To all who served behind the scenes, and worked and sweat and worried...



To those up front who manned the booths, and never once looked flurried...



To those who came and bought and looked, ... Thanks

We couldn't do without you!

MOREL-GROWING PROCESS PATENTED Herold Treibs
[Tri-Cities Mycological Society Newsletter]

For nearly two hundred years, people have tried to grow morels commercially, but none have succeeded. A new process, developed by the late Ronald Ower [June 1986 *Spore Prints*] and by Gary Mills and James Malachowski, promises to change that.

In the past, several workers have developed ways to grow morel mycelium, but none were able to get the mycelium to produce fruiting bodies (morels). The first successful laboratory growth of a morel fruiting body was by Ower in 1980, working at the Herbarium of San Francisco State University. His first successful fruiting of *Morchella esculenta* was on a substrate of cooked wheat berries with 50% moisture. It was conducted in a walk-in growth chamber maintained at 15-18°C and 85% relative humidity, and dark except for the time required for daily observation. He was able to see the development of a morel, starting with a small patch of hyphae, the primordium, about a millimeter in diameter. The next day it formed a small tip, which grew to nearly a centimeter in four or five days. By that time, it was possible to distinguish the cap from the stipe. By 21 days, it had dark pits and light ribs, which later acquired a golden cast more characteristic of *M. esculenta*. The mature morel weighed 13.5 grams (about half an ounce) and was 126 mm long (about 5 inches). He subsequently grew several more morels.

Mills and Malachowski, working in a cooperative agreement with the Neogen Corporation, Lansing, Michigan, and Michigan State University, further developed the process over a three year period. U. S. Patent 4,594,809 has been issued to Ower, Mills, and Malachowski, and assigned to Neogen. The key to the entire process as described is the growth of the sclerotia adjacent to a nutrient-rich substrate, removal of the nutrient-rich substrate, and inducing the production of the fruiting bodies, the morels, by flooding the substrate with water for a time.

The patent describes the growing of sclerotial spawn as the first part of the process. Afterward, the sclerotial spawn is used to inoculate a substrate, and the actual production of morels takes place in two variations of the process.

The sclerotia, a resting form of the morel hyphae, store nutrients from the initial growth phase. These are induced to grow in sterilized soil which is separated from the organic nutrient source by a separator such as perforated plastic or metal foil. The nutrient source may be wheat or other organic matter. The inoculating material (spores, vegetative hyphae, or sclerotia) is placed into the soil, from which it grows into the nutrient-rich substrate and eventually colonizes the soil with a mass of sclerotia, which is used as the sclerotial spawn.

In the second part of the process, the sclerotial spawn is inoculated into a second substrate, allowed to grow, and induced to form fruiting bodies. In one variation of the process, a nutrient-rich substrate is placed in jars, covered with perforated metal foil, and inverted onto a nutrient-poor substrate such as ground fir bark, along with some sand and a little sphagnum, redwood bark, and lime. After a period of growth, the hyphae grow into the nutrient-poor substrate, taking with it the nutrients obtained from the nutrient-rich substrate. When sufficient growth has taken place, the jars with the nutrient-rich substrate are removed. In another variation of

the process, a large amount of the sclerotial spawn is added directly to the nutrient-poor substrate. After the sclerotia have been allowed to grow, and are then deprived of additional nutrients, they are "shocked" into producing the reproductive phase, the morels, by flooding the substrate with water for half a day to a day and a half. The water is then drained off, but the substrate is kept moist. After a few more days, the morels start to form, and may be harvested when they reach maturity. Sometimes additional crops may be obtained by again flooding the substrate with water. The temperature and humidity are carefully regulated during the entire process.

James Herbert, president of Neogen, says that market studies indicate that the world-wide sales of morels might hit \$25 million annually, with about two-thirds of the supply consumed outside of the United States. More work is needed to reduce the cost of commercial production. At present, fresh morels sell for \$20 to \$40 per pound, and he expects the process can beat that price. He says that the morels grown in the lab have the same aroma, texture, and taste as those picked in the wild, and should have a better appearance. The developers of the process expect to be able to further develop the process in about two more years so that they can license commercial mushroom growers to begin large-scale production.

Research on the process has been funded by Neogen and three partners: Kuhn Champignon, a major producer of edible mushrooms in Switzerland and France; Salk Institute Biotechnology/Industrial Associates, Inc. (SIBIA), of La Jolla, California, a biotechnology company owned jointly by Salk Institute and Phillips Petroleum; and Skandigen A. B., a biotechnology company based in Stockholm, Sweden.

MEAT-EATING MUSHROOMS

Spores Afield
[Colorado Mycological Society]

Scientists have found that certain edible mushrooms capture and consume microscopic animals, according to a recent article in *American Health*. Chief among them is the oyster mushroom, *Pleurotus ostreatus*, a fungus that sits benignly until a round worm crawls into the neighborhood -- usually a rotting tree stump. The fungus then releases a paralyzing toxin, buying time to grow thread-like shoots into its prey, which it then digests.

Of 27 mushrooms tested, 11 attacked and ate tiny animals. Biologists R. G. Thorn and G. L. Barron, who conducted the tests at the University of Guelph in Ontario, suggest that the ability to feed on worms enables these species to thrive in such harsh substrates as rotting wood, where nitrogen is in short supply.

MOREL SPAWN

NJMA News
[New Jersey Mycological Association]

William Boulanger and Paul Erickson have cultures of various morel species on a rice base. They can supply 100 ml rice cultures in pint mason jars for \$7.50 plus postage. They will refund 50 cents for return of jars. In return they are looking for cultures or specimens of *P. sulphureus*. Phone Boulanger at (609) 443-4913 for more details.

Because the Seattle School District is planning to re-open the Monroe Center, we will soon need to meet at a different location and perhaps at a different week of the month. If any one knows of a suitable location -- considering size, parking, and cost -- call Coleman at 322-2554. We will also need office/library and storage space, but not necessarily at the same location.

SPECIAL NOTICE OF MEETINGS

to consider changes in the By-Laws in relation to time and date of regular meetings, assignment of the address of the principal office of the Society, and the the time schedule framework for nominations and elections in order to be completed and ready for the Annual Meeting:

1. The Regular Board Meeting on Nov. 17, 1986, at 7:30 p.m. in Room 104 of the Monroe Center will consider motions (from board members) for changes in the By-Laws in relation to the above notice.
2. These proposed ammendments to the By-Laws will be presented to the membership at the Regular Membership Meeting, 7:30 p.m. on Dec. 8, 1986, in the auditorium of the Monroe Center.

Coleman Leuthy, President