The Boston Mycological Club

Bulletin

A Spore-adic Publication

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IN THIS BULLETIN

Cover photos by Anita Alllison

The cover of the January 2022 Boston Mycological Club Bulletin was created from a stained glass mosaic by local artist Joshua Winer. Depicted in the image were the following mushroom varieties: chicken-of-the-woods, chanterelles, one porcini, a fairy ring, and birch polypores. David Luken correctly identified them! Congratulations and great job, David!

A basket of finds from a foray at the Harvard Forest in 2021.

A phalloides found by BMC member Courtney Constantino during a foray Trish Adams's house.

Christina Rosenthal (left)very pleased with a great matsutake haul during the Fall 2022 BMC Cape Cod Weekend. The youngest participant, Peregrine Walton (right), helping to look for mushrooms during the same event.

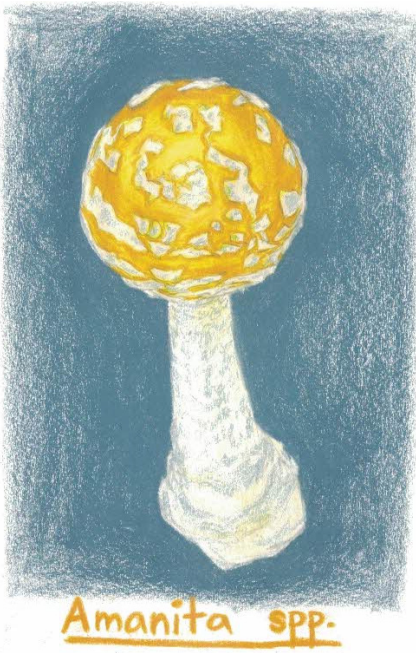


Illustration by Natalie Tessicini

Molly Latanzi (below) after finding chicken of the woods, her first edibles(!), and a collection from another of her forays (above).

Hifes connecting threads

after Craig Santos-Perez

By Liam Nokes

[**Fong** : the body complete -
Its extensive subterranean network
Its interface with the plant - and
The flows of material, nutritious and
inherited. Does it cross oceans,

Through the

[**Fang** : muddy interface -
Between earth and sky
The dirt (the soil?) seeping -
Between my toes among the trees.

It is fabled that we have searched for generations - following the fang, listening to the arbres. Just the two of us? Mentor and learner, el meu Avi i jo, el bosc i nosaltres. *All of us? We follow ancestors in a land beyond alien to them - am I alien to them? They searched to escape the tyranny of serfdom, protected by the unpredictability of their prize. I search - to find them?*

[**Bolet** : its fruit - the mushroom.
A manifestation - of pan-forest ballet.
The moment of euphoria - of
Belonging - and

[**Aixopluc** : the safety from the elements -
A shelter. For me the selvatge -
Connection through the terra -
My family and my past through the *Hifa* -
Bloodlines now buried

Pot ser que estic tocat del bolet

Glossary:

- Hifes – hyphae
- Fong – fungus
- Fang – mud/earth
- Arbres – trees
- El meu Avi i jo – my grandfather and I
- El bosc i nosaltres – the forest and us (ourselves)
- Bolet – mushroom
- Aixopluc – shelter
- Selvatge – wild
- Hifa – hyphae
- Pot ser que – it is possible that
- Estic tocat del bolet – Literally "I am touched by the mushroom," colloquially "I have gone crazy"

Morels: More Than You Ever Wanted to Know

Susan Goldhor

It's spring and – since hope springs eternal – I'm thinking about morels. In order to think about morels in an orderly fashion, instead of the usual emotional chaos they arouse in my brain, I took two books out of the library: Morels by David Kuo, and Morel Tales by Gary Alan Fine. I wish I could tell you that as a result, I have logical information to impart, which will fill your baskets and clarify your understanding. Alas, the information I've garnered is useful mainly to bolster our egos; even the experts regard morels with strong emotion but weak understanding.

When Tom Volk spoke to our club many years ago, he stated that morel systematics is "a big mess," with estimates of the number of species ranging from four to 65. Altering the adjective, Michael Kuo writes, "An enormous mess surrounds the species name Morchella deliciosa." As for Morchella esculenta, the yellow morel, there are at least two genetically distinct types of this morel, which are (according to Kuo) indistinguishable by morphology, microscopic examination, or spore prints. (Volk simply says that M. esculenta and M. deliciosa are the same.) Morchella crassipes, with its long, wide stem, turns out to be just an odd growth form of the yellow morel under wet, warm conditions. Gray morels turn out to be merely alternate color forms of yellows. There are black morels that really do differ from the yellows, but they divide genetically into five different species, one of which, M. conica, Kuo suggests "may be the most confused name in morel taxonomy." And I'm not even going to mention M. semilibera, which I regard as a microcephalic yellow morel with jowls.

Well. Now that I've clarified the taxonomy and nomenclature for you, I'll move on to the when and where of finding morels. In 2004, Kuo charted sightings of morels documented on selected bona fide morel internet bulletin boards. Each sighting was mapped as a red dot. Our region, New England, came in from April 27th to May 10th. Of course, this is different in different years and the general rule of thumb for our region is "May." A quick glance at Kuo's time maps demonstrates how pathetic our region is, with its few, rapidly dissipating red dots, while the Midwest and parts of the West Coast have rich harvests of dots going on and on for months. I've occasionally wished that New England had forest fires (just kidding, Smoky!),

but Kuo assures us that burn sites only yield morels west of the Rockies. (Plus, Tom Volk claims that burn morels have less flavor, perhaps because they contain no yeast or bacteria. I'm not sure I agree.) As to the other harbingers of a good morel year, Kuo finally gets so frustrated trying — unsuccessfully — to link moisture and temperature to morel fruitings that (in a wonderful chapter entitled "Theorizing Morels") he finally links the 2004 fruitings to whether the state voted for Bush or Kerry. It was the blue states that had the good year. I suppose they deserved something since Bush won. Unable to come up with a good theory to predict morels, he satisfies himself with a good theory about morel hunters: they love theorizing.

Kuo does the same for where morels grow and when. After giving a long and totally contradictory list of where he's been told to look for morels ("on south-facing slopes; on north-facing slopes; in sandy soil; in clayey soil; in soil with a high pH value; in soil with a low pH value" etc.) he argues "that all of these theories – even the ones that are opposites – are correct. By this I mean that they all produce morels for the people doing the theorizing. . . At the same time, however, most of these theories are probably dead wrong, by which I mean that none of them holds much water when the standards of empiricism are applied. . . When someone says 'morels grow on south-facing slopes,' what we have learned is that the speaker finds morels on south-facing slopes. We have probably also learned that the speaker does not look for morels on north-facing slopes." Tom Volk at least ventures

A morel discovered by the sister of BMC member Jana Harris. Read more about the sisters' remote foraging adventure in this issue of the BMC Bulletin.

the guess that "maybe morels do better at higher pH"; ie, in less acidic soils, and both Tom and Michael are willing to link morels to dead elms and very old orchards. I have found morels in a very old orchard (I have also looked in vain for morels in very old orchards), but the one thing that people seem to agree on is that morels are mushrooms of disaster, doing best where there have been serious disturbances. They seem to appear in affiliation with dead trees, perhaps because as long as the tree is alive, they're perfectly content to carry on their mycorrhizal life style, rather than wasting energy on fruiting bodies. One theory about morels that many of us subscribe to is that the place to find morels is where someone else -- preferably someone else in a distant part of the country -- is looking.

The one thing I know for sure about morels is that most of us feel that they're special. In Morel Tales, Gary Fine calls morels "the mushroom with the greatest cultural resonance". He points out that morels are linked to the divine (by us hunters – not by theologians), with references to morels as the forbidden fruit in the Garden of Eden, or – in a more pagan framework – as the food of the Gods. Morel hunters are "driven" in a way that hunters for other species are not. As one writer comments about her own drive, "It's meshuggonah". Morels are invested with animate traits; more than one hunter has sworn that they are capable of becoming invisible. Fine quotes one as saying, "The way I generally get (morels) is to get my chainsaw running at the edge of the woods. I put it on the ground while it's still running, so that the mushrooms think I'm cutting wood. I sneak up, pick off the lead mushroom, then round up the rest." Fine comments : "These collectors 'know' that they are kidding, but they also 'know' that they are telling the truth". As for Kuo, one of the many pleasures of reading his book is his willingness to confess his (actually pretty pathological) morel mania, which has led him on two month long, incredibly uncomfortable (since he describes himself as "among the few morel hunters who do not have six-figure incomes and private jets") and frequently failed hunts. Larry Millman, who took me on my first morel hunt, won't even start to look until he has sacrificed a coin on the chosen site and intoned a prayer to the goddess Morchella. (When our hunts have failed, I've blamed him for being too cheap; why should goddesses be immune to inflation?) Larry doesn't bother with prayers when he sets out for other quarry; who ever uttered a prayer that they would find Armillaria or even porcini? Fine (a sociologist who seems to collect collectors the way collectors collect mushrooms) quotes Morchellaphiles who claim that morels are the most delicious of mushrooms, but points out that their ineffable flavor "may be as much in the mind as in the palate". Although hunting morels has me quivering with excitement and hyperventilating as nothing else does, there are other mushrooms I'd as soon eat. And, although I know that the addition of a few small morels to a restaurant dish raises the price by about a dollar per morel, I also know that the chef's sauce probably drowns out whatever flavor the morel has to offer. So, I don't think it's the eating. I think that Larry and Gary have it right: we're dealing with a goddess here. For those of you who haven't read any mythology recently, let me remind you that gods and goddesses are powerful, seductive, arbitrary, capricious and whimsical, and have a long history of luring us humans into destructive relationships. They appear or disappear at will, shape-shift, and inhabit wild places; in short, Morchella is probably a direct descendant of Zeus, that master of disguise and seduction (although in his case, perhaps rape is a more accurate descriptor).

Terry Hayes has an admirable essay in an ancient N.Y. M. S. Newsletter, entitled "Why I fell in love with mushrooms", in which s/he writes, ". . . am I the only one who has noticed how much mushrooming has in common with be-

Members Christina Rosenthal and Jim Rawson using microscopes to inspect their finds from the Fall 2022 BMC Cape Cod weekend.

ing in love? This may be caused by the extraordinary focus we bring to the objects of our delight. Then again, it may just be the inevitable result of all that crawling around in the brush. Whatever the reason, we are gluttons in mushrooming as we are in love. We jealously guard our private preserves, exhaust ourselves in the service of our passion, rest only when we have no choice, when the secret springs run dry. Judging by the unusual number of mushroom enthusiasts in their spry 70s and 80s (with here and there a determined 90), our springs run strong and deep. Mushrooming is like being in love – forever." Well, Terry, there's love – and then, there's love. And if finding chanterelles or oysters or honeys in the same place each year is like the married love you can count on to support you into your dotage, finding morels has more in common with the heavy breathing and hormonal maelstrom of illicit passion. (Although maybe those folks in Michigan, who find morels by the hundreds each year, regard them with jaded eyes, caring only about finding enough to win the annual contest.) So, to return to those questions which have tortured so many of us for so long, such as where morels grow or what causes a good morel year (to say nothing of their systematics), Michael Kuo's bottom line is that morels are so arbitrary and capricious that we humans, unable to deal with this behavior, simply invent rules for the object of our love to follow. Those of you who have delved into French literature of the late 19th and early 20th century will, of course,

recognize the parallel with passionate, adulterous and ultimately tragic love; the tragedy stemming from the obdurate refusal of the love object – whether Odette or Morchella -- to follow those rules. At first I thought that all of our heavy breathing was due simply to the facts that morels appear a) after a long mushroomless spell, and b) at a time when few if any other delectables are around. But now I think it's the goddess thing; the illicit passion thing; the arbitrary, capricious movie star behavior thing. And you know what? I can't believe that I'm falling for it. Damn you, Morchella!

The flame of my largely unrequited love is fanned by where we live. New England is not the best region for lusting after morels. No, let me change that. It's a great region for lusting after morels; it's just not a great region for finding them. So, in a pre-Covid year when I found that I'd be in the Pacific Northwest in May, I realized my chance had come. I emailed a myco-penpal, Jane Eert, who lives on Vancouver Island, and asked her if she'd be around then and if she could point my husband and me towards a possible morel site. Well, Jane did far more than that. She actually took us hunting with her. It is, of course, well known that morel hunters share their favorite spots with about the same frequency that Mafia members rat on their bosses. (And yes, I've heard the one about the old guy who willed his favorite morel spot to his son but didn't tell him where it was.) But Jane could do it because a) the area had been slated for development; b) we couldn't find our way there again if our lives depended on it, c) we live on the opposite coast, and – most importantly -- d) she is an exceptionally kind and generous person. When we set this up I had a vision of our hunting in one of those gorgeous, furry, ultra-green temperate rain forests. But nothing could be further from the truth – we hunted in a scrubby, partly logged, overgrown area criss-crossed with rutted logging roads and with no trails at all; just stepping over and under fallen trees and scratchy brush. The morels were far apart; one here and another there, with no pattern of affiliation that we could see (morels, like Zeus, are actually extremely promiscuous in their attachments), each one having to be spotted as some minute fraction of it peered from behind leaves or under a log. Jane not only left us behind, stumbling and entangling ourselves as she leapt nimbly through the undergrowth, but also was by far the prime spotter. The three of us gathered two grocery bags of morels; an exciting and unheard of experience for me. Then she took us home, where her partner, Rod, had prepared an amazing meal of local spot prawns, local asparagus, local lamb and – of course – local morels. I wish to state here that the morels cooked by Rod far out-classed anything I've ever eaten in a fancy restaurant.

Rod is a truly great cook. But part of the savor was that we had picked those morels ourselves. We'd stalked them, gotten banged up and scratched for them, played hide and seek with them – each one of them represented a small but very sweet victory over the forces of nature, chaos and protective coloration. Had we bought them in the market, they would not have tasted so delicious. And had they been cultivated, they would have had almost no savor at all.

If You Drill Them, They Will Grow

David Babik

When BMC member Chris Neefus lived in Massachusetts, he offered us classes on how to grow mushrooms outdoors on logs. Chris is an avid mushroom cultivator, growing several types of Shiitake and oyster mushrooms, along with beautiful Hericium (Lion's Mane) and colorful beech mushrooms (Shimeji). Due to COVID restrictions, the class hasn't been possible the last two Springs. This meant that Chris was faced with the task of inoculating about 60 logs, each drilled with about 40 holes to be filled with sawdust spawn, all by himself. Not a monumental task but a a bit monotonous.

He said he would happily welcome some company, so Ken Feinberg and I volunteered to help out. On a pleasant Saturday, in late March, we headed to Chris's house in Topsfield to help with the job. The whole process is not awfully complicated but like many things, having the right tools makes it a lot easier. Field & Forest (https://www.fieldforest.net/) is a mail order mushroom cultivation company that most of his supplies come from.

Chris had already taken care of the biggest part of the job, procuring the right size logs. The logs should be cut from heathy trees during the dormant season. Oak or Sugar Maple is the material of choice but some other hardwoods will work too. The logs should be a length that

Drilling the logs with a high-speed angle grinder

is comfortable to carry, about 40 inches. Diameters of 4-5 inches are ideal. (bigger than that gets too heavy). The first step is to drill holes in the logs. The holes should be in a line from one end to the other, spaced about 6 inches apart. The log is then rotated slightly and another row is drilled with the holes staggered between the holes in the prior row. This continues until the log has holes all around. Chris uses a highspeed electric angle grinder with a special bit and a stop collar that lets it go into the wood about an inch. Be ready for a lot of flying wood chips.

Sawdust Spawn broken up and ready to insert, with innoculation tool.

Next comes inserting the sawdust spawn into the holes. Chris buys organic blocks of hardwood sawdust that has been inoculated with active mycelium from Field and Forest. The cream-colored mycelium spreading throughout the medium is easy to see. Chris breaks up the mycelium and puts in into a small plastic container. At the same time, hotplates with melted cheesewax stand ready to seal in the sawdust. Needless to say, there is a special tool to pack the sawdust spawn into the holes. This tool is constructed of a 12mm diameter brass cylinder with a spring-loaded plunger and wooden handle. The spring retracts the plunger into the cylinder so the end can be filled with sawdust spawn by shoving it into the sawdust container. Hitting the wooden knob on the back of the tool advances the plunger and forces the mycelium plug into the hole. The hole is then sealed with hot wax applied with an item that looks like a Q-Tip on steroids. The mycelium will actually grow into the wood so sealing it in with wax does not prevent it from spreading. Inoculated logs are laid on pallets in a shady location. It takes about a year for the mycelium to fully colonize the

Shiitakes ready to harvest

log and extract enough energy to produce mushrooms. Once the mycelium run is complete and when the weather warms, the logs can be "force fruited" by soaking them in a tank of cold water overnight. The mushrooms will begin to "pin" at 3-4 days and will be ready for harvest in a about a week. Each log will produce up to a pound of mushrooms. If the logs are allowed to rest for 8 to 10 weeks, the forced fruiting process can be repeated. Logs remain productive for 3 to 5 years before they decay to the point where they are no longer viable.

There are lots of different types of fungi available for backyard growers from commercial supply houses. Oyster (Pleurotus spp.), chestnut. (Pholiota adiposa), nameko (Pholiota nameko), and Lion's Mane (Hericium erinaceus) can be log grown using the same "drill and fill" method as Chris uses for Shiitake, although they can't be force fruited. You'll just need to wait for a natural flush. There are other species, like Blewits and Wine Caps that can be grown in compost, wood chips, and leaf mould.

Backyard mushroom cultivation is not very difficult and is only one option for growing edible mushrooms. I know people who grow oyster mushrooms in plastic bags of sawdust hanging in the window of a cool room. This method allows you to harvest fresh oyster mushrooms throughout the winter. Chris also has an indoor growing area where he raises a variety of oyster, beech, nameko, chestnut and lion's mane mushrooms on sawdust blocks. If you find this is something that interests you, there are plenty of books and websites dedicated to this rewarding hobby. Hopefully, by next year we will be in a better situation and we look forward to Chris being able to offer his class again.

The shiitake haul — well worth the wait!

Lichen Survey of the Dorchester Heights Monument's Tower

Judy Jacob and Michaela Schmull, PhD

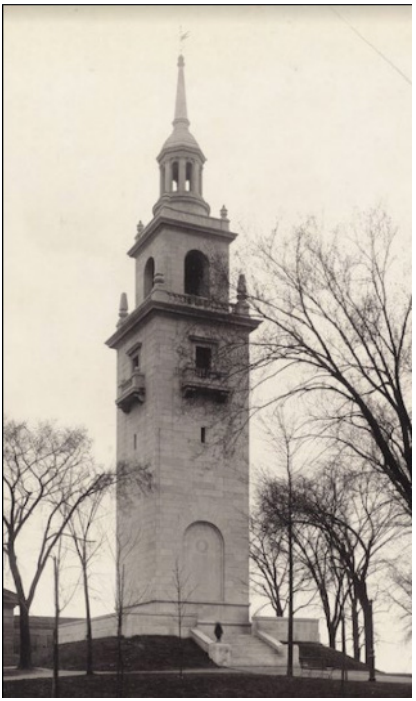
With a view of Boston Harbor, the Dorchester Heights Monument commemorates the Continental Army's first win in the American Revolutionary War. Today, most visitors see a park with a grand 115-foot-tall white marble tower. The National Park Service (NPS) sees a park too — and also a tower with cracks, rusting iron, missing mortar, and a surface partially covered with lichens. Before the start of masonry repairs for a multi-million-dollar restoration project, the NPS brought us — a lichenologist and an architectural conservator — on board to conduct a survey of the tower's lichens, both to document them before the onset of repairs and to learn more about the condition of the marble.

Candelariella aurella and some Lecanora dispersa on mortar filling a crack. Credit: National Park Service

The tower is in the form of a Colonial New England church spire with a four-sided shaft and belfry. It was designed by the Boston architectural firm of Peabody & Stearns, completed in 1902, and constructed of marble panels set with mortar and iron cramps on a brick core.

Marble for the tower was quarried in northwest Georgia. The stone is characterized by coarse calcite crystals with wispy gray veins of accessory minerals. Stone blocks were taken from the quarry, sawn into panels, and sanded to create smooth dense surfaces with a soft sheen. One significant property of marble is that it dissolves in acid and with Boston's rain now about pH 5, the once smooth surfaces of the tower have eroded to a rough and craggy terrain.

What Peabody & Sterns did, essentially, was to create a marble outcrop on Dorchester Heights. For the past



"Evacuation Monument," April 26, 1904, Nathaniel L. Stebbins, photographer. From the collection of Historic New England.

120 years, the marble has behaved as one would expect of a natural outcrop: it has weathered, eroded, and hosted living organisms. Lichens, ranging in size from a few millimeters to a few centimeters wide, are what can be identified macroscopically. What we cannot see, and did not cover in this survey, are bacteria, microfungi, microalgae, and faunal communities.

What are lichens and what is their relationship with the Dorchester Heights tower? Lichens are made up of at least two organisms: a fungus (heterotroph) comprised of thread-like structures called hyphae, and one or more algae or cyanobacteria (phototrophs) that live among and are attached to the hyphae. The body of the lichen, the thallus, ranges in color from greenish gray to brown or black to bright yellow and orange. A lichen anchors itself to a substrate with its hyphae. On eroded marble, hyphae wrap around semi-detached crystals and position themselves in recesses between crystals or in micro-cracks. On mortar, hyphae penetrate pores. Lichens on the tower favor a calcareous substrate (both marble and mortar) which buffers the acidity of atmospheric water; these lichens are also tolerant of Boston's current atmospheric pollutants.

The orientation and massing (shape) of the tower has determined the locations of lichens and their densities. As you walk around the perimeter, you see a dramatic color change: the south and west sides are white and relatively lichen free, while the north and east sides are gray and covered with lichens. Up close, thalli are various colors but prothalli (thalli edges) are often black and when visually mixed with the white marble, give the north and east sides their gray color.

Lichen density is due to the variables of solar radiation, available moisture, rates of moisture evaporation, and the texture and physical structure of the substrate. The highest concentration of lichen on the tower is the bottom portion of the north side. Other concentrations occur in micro-cracks and on mortar. Lichen-free zones appear under the balconies that are protected from direct rain, under a bronze plaque where copper-oxidation products have

washed down the surface, and in locations where long-ago graffiti was removed by sand blasting the marble back to a smooth surface. Unfortunately, there are not enough photographs of the tower, taken up close and over time, to mark when lichen habitation began and when specific patterns emerged.

Why would a lichenologist and an architectural conservator conduct a lichen survey of a tower? For a lichenologist, the tower provides a study site with a relatively uniform topography and mineralogy, and with large surfaces exposed to the four cardinal directions. For an architectural conservator, lichens are a tool for better understanding water run-off and retention on stone, and aid in the identification of micro-cracks. In coming decades, lichen composition and density on the tower will change in response to natural and manmade conditions; our survey will serve as a baseline for identifying and evaluating these changes, and with that, a better understanding of Boston's climate and air quality.

Ten species were collected; nine were positively identified. Identification was based on morphological, anatomical, and chemical analyses in the field (ground and belfry levels) and in the laboratory. Voucher specimens are on long-term loan to the Farlow Herbarium. List of species (identified by Michaela Schmull):

Bacidina egenula (Nyl.) Vězda
Candelaria concolor (Dicks.) Arnold
Candelariella aurella (Hoffm.) Zahlbr.

The north and east sides of the Dorchester Heights Monument's Tower, 2021. Credit: National Park Service

Flavoplaca citrina (Hoffm.) Arup, Frödén & Søchting
Lecanora dispersa aggreg.
Physcia adscendens H. Oliver
Physcia millegrana Degel.
Physciella chloantha (Ach.) Essl.
Xanthocarpia feracissima (H. Magn.) Frödén, Arup & Søchting
Xanthoria parietina (L.) Th.Fr. or *Candelaria fibrosa* (Fr.) Müll.-Arg.

This article was contributed by Judy Jacob, Senior Conservator; National Park Service; Historic Architecture, Conservation, and Engineering Center and Michaela Schmull, PhD; Director of Collections, Harvard University Herbaria.

Underhanded: A Cautionary Tale of Foraging Foibles by Mendacious Mycophiles

Theresa Urist

I generally don't expect an audience for my foraging adventures. Typically, they're solitary affairs, witnessed only by the occasional chipmunk or squirrel.

So imagine my surprise when I emerged from some undergrowth to see two people rapidly turning away from me. It was clear they had been watching my actions, and then quickly tried to hide that they were doing so. Strange behavior, indeed. That is, until I looked a little closer.

"Carolyn, is that you?"

Yup. It was my friend Carolyn and she was busted.

"What are you doing?" I inquired. But I already knew exactly what she was up to. When she saw me dart into the woods, she had determined that I was onto something. And she was hoping I would leave whatever I found, intending to return with a sack or a basket. After I had left, she figured she'd slither over to the spot and nab the goods…which in this case happened to be a beautiful oyster specimen, with multiple tender layers all bearing a delicate woodsy aroma.

The look on Carolyn's face when I realized what was afoot was telltale caught-in-the-act/hand-in-the-cookie-jar, a mix of embarrassment with a patina of surprise. While she initially tried to play it off, it was too obvious not to acknowledge. And so, in the middle of the loop trail around the reservoir, when I artfully accused her of "pinching my pleurotus" we dissolved into peals of laughter.

I should mention that Carolyn and I have a bit of a fungal history. She's a neophyte in the world of foraging. And so, when a year or so back, she sent me a photo of a fruiting in her yard, wondering if perhaps it could be a flush of golden morels, I responded in an appropriately cagey manner. I knew exactly what they were…but deigning to be scientific about it, I told her I wasn't sure, that I'd "need to do a spore print."

In less than five minutes, I arrived to her yard with a cooler to claim the catch. And in even less time, and with no spore print taken, those lovely golden morels were sizzling in butter on my stove. They were incredible, but I do have a conscience. So, long after they had been enjoyed, I fessed up to what

I had done. Based on my over-eager arrival to her yard, she had already discerned my intentions. So Carolyn and I have a bit of a history, or maybe it's a spore, er, score to settle.

A year or so after my act of questionable morels, she was hoping to emerge from those woods with some purloined pleurotus. But when it all came to light, we had a good laugh and I invited her over to my partner Andrea's for a dinner featuring that afternoon's haul.

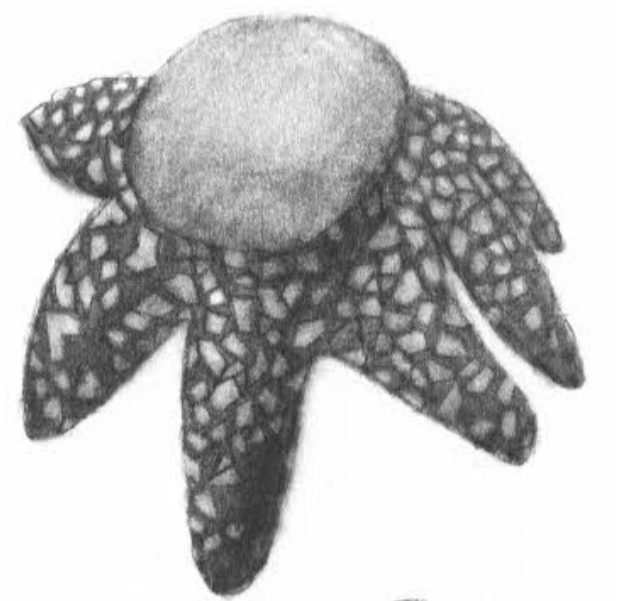
Which brings me to the second part of my story…one that has taught me a valuable lesson: in the realm of fungal bounty, even romantic partners may not be trusted.

That evening, Carolyn and I went to Andrea's house to revel in the meaty oysters. And there, my partner decided to cook up a little sampler of wild mushrooms. She fried up some pheasantbacks and maybe a chicken strip or two. And then, the oysters, fanned out in their earthy buttery glory. These were all arranged tastefully on a lovely platter along with the rest of the meal. But something didn't add up. While there were certainly some spectacularly delicious pleurotuvs on that tray, the volume seemed, well, a little thin.

I peeked into Andrea's fridge, only to find a paper sack in the back containing more of my haul. The confrontation went like this (with me pointing at the platter): "Andrea, is this all of the oysters?" My query was followed by her blank stare, which was followed by my trip to the fridge to retrieve the sack, followed by a fess up.

"OK, so I held a few back!" she exclaimed in a tone that bordered on self-righteousness. Sort of like she was doing the prudent thing for the good of all parties involved, or some other such nonsense. Which then turned into the inevitable truth telling.

And from these tales has emerged my ultimate conclusion: apparently all's fair in fungal foraging. When it comes to wild mushrooms, even my closest compadres can resort to behaving like double-crossing characters in some wild west epic.



A pencil drawing of a Hygroscopic earthstar (Astraeus hygrometricus) by BMC member Natalie Tessicini.

The Poet Foraging Mushrooms

Mark Pawlak

The poet Denise Levertov and her novelist husband Mitchell Goodman owned a farmhouse getaway in Western Maine where I was a frequent guest in the 1970s. I'd studied poetry with Denise at MIT while completing a degree in physics; after college, she became my poetry mentor. It was when visiting their Temple, Maine, farmhouse one summer I learned that Denise regularly foraged mushrooms for the table in the surrounding woods while Mitch gagged at the thought of sampling one.

The kitchen window of their farmhouse looked out on a lone apple tree beside a fieldstone fence a short distance behind the house; beyond the fence was a broad, grassy field that descended sharply in the direction of Temple Stream, where on hot summer afternoons, after hiking in the nearby woods, we skinny-dipped in its cool waters. In the opposite direction, the field rose up from the farmhouse to a tree-lined ridge. On a clear day, standing back of the farmhouse at the top of the field, you could see Mt. Blue in the distance—blue-hued, of course. After mornings spent reading and writing, we took afternoon walks to the top of that field; along the way, Denise told me stories about her childhood in Ilford outside London. As she bent to pick wildflowers, she called each by its name: Dutchman's breeches, butter-and-eggs, cowslip, forget-me-not...names she had first learned from her mother and now taught with me.

Except where thinned for firewood, the surrounding woods consisted of dense growths of balsam fir, red maple, white pine, and a smattering of oak and beech trees. There, and along a rutted dirt road that climbed past long abandoned farms with wildly over-grown fields and remnants of cellar holes, Denise lead me on mushroom forays. We collected boletes, varieties of gilled mushrooms, and an abundance of chanterelles.

Although as a child I'd accompanied my Polish immigrant grandfather when he harvested giant puffballs in the as yet undeveloped scrublands of Western New York, it was those Maine forays that hooked me for life on foraging wild mushrooms. As for Denise, I'd assumed it was her Welsh mother, who'd homeschooled her, who introduced her to gathering and identifying mushrooms, but knowing that she and Mitch had run in Bohemian artistic circles during their decades living in Greenwich Village, the influence could have just as likely been John Cage.

Back at the farmhouse, Denise emptied her wicker basket onto the kitchen table and showed me how she removed

the stems, then made spore prints of the gilled mushrooms by placing individual caps on slips of notepaper, leaving them overnight, each covered by a teacup. The next morning, we poured over her well-thumbed copy of Kaufman's Mushrooms of North America, in the Dover Press edition. My science studies had introduced me to the use of dichotomous keys for the identification of specimens, but Denise, ever the autodidact, admitted she had never used one, instead, to my astonishment, she had created her own complex system of indexing and cross-referencing that tome to aid her in determining genus and species.

At dinner, Mitch always begged off the proffered mushroom appetizers. One time, when I'd gathered some large parasol mushrooms I'd found growing in the field behind the farmhouse and had fried up for dinner, try as I might, I couldn't persuade him to sample them, even though I'd showed him an illustration and the description that said it was edible. He told me he hadn't forgotten the time his wife's wrong call of a red-capped bolete had made her violently sick. I've always wondered whether, too proud to publicly admit her error, Denise sanitized her memory of it when she wrote her only mushroom poem that I'm aware of:

Waving to the Devil

Tasted(and spat out)
Satan's Boletus.
Delicious.

(from *The Freeing of the Dust*, 1975)

Levertov lived and taught at several universities in the Boston area from 1970-1987. "My Non-Fatal Mycophilia" was reprinted in the BMC Bulletin a few years ago. Mark Pawlak's book-length memoir My Deniversity: Knowing Denise Levertov was published in fall 2021 by MadHat Press. He is the author of nine poetry collections, most recently Reconnaissance (Hanging Loose, 2016), and the editor of six anthologies. His work has been translated into German, Japanese, Polish, and Spanish, and has been performed at Teatr Polski in Warsaw. His poems appeared widely in anthologies such as The Best American Poetry, Blood to Remember: American Poets on the Holocaust, and in the literary magazines New American Writing, Arrowsmith, and Mother Jones, among many others. He teaches mathematics at UMass Boston.

Send us your artwork, photos, and finds!

The BMC Bulletin is a great place to share snapshots from the fun of foraging. We love to see scenes from our members' mushroom adventures and the creativity that fungi inspires. Send us your images at bulletinbmc@gmail.com.

Adventures in Remote Italian Morel Hunting

Jana Harris

A spring of 2021 had us still on partial lockdown in parts of North America and total lockdown (again) in Italy. For me personally, the year 2020 was not just Covid year but also myco year. I spent countless hours alone in the woods and enjoyed all that time discovering fungi. In a way, since 2020, I have been in constant myco-fever. On the other hand, in 2020 I also missed a visit from my sister and mom, due to travel restrictions. Yes, I was hoping to take them to my favorite spots on the North Shore of Massachusetts to share my myco obsession with both of them. I kept telling myself maybe some of my myco-fever will rub off onto my older sister Danka. Danka lives in Friuli Venezia Giulia region of Northern Italy . During her daily walks she would see some mushrooms, but was never that curious what they actually are.

Danka would report back to me and send me pictures of mushrooms after her daily walks around the village of Tesis Di Vivaro. In late April of 2021, things got more interesting. I received a message that she spotted some light yellow colored and pine cone-like looking mushrooms. She had no idea what they could be.

"Say no more!" I told her in amazement over the wifi call. " You will have to go back and take pictures and bring whatever is growing there home."

I already knew at this time of year

One of the sisters' finds

it can only be Morel. I was hoping she would find enough of them to send me some. So the next day my sister ventured out again. It turned out it would not be easy to pick these mushrooms. They were growing under the short Hazel trees and very close to the trunk. They were scattered between sticks and piles of leaves. Nearby were groups of fuzzy little pods that actually looked like pine cones. Crawling on all 4s to reach mushrooms was the only way to reach the mushrooms. I wouldn't mind even doing an army crawl - now renamed "mushroom hunter crawl". It would be well worth it.

After "remote" and careful examination involved slicing some of the mushrooms in half we knew with 100% certainty what we had. It was Morel, in fact Morchella esculenta. The generic name Morchella is said to come from morchel, an old German word meaning 'mushroom', while the specific epithet esculenta is Latin and simply means edible. Edible Mushroom seems like a very good name for this species! Although they are highly prized edible mushrooms, Morels of all types must always be cooked thoroughly; otherwise they can cause severe stomach pains and sickness. So I made sure my sister knew this. (There is also a risk of confusing Morchella esculenta with the deadly poisonous False Morel Gyromitra esculenta, whose cap has a brain-like surface rather than a pitted surface.)

My sister found at least 5 or more hand sized Morels… but who knows how many she missed. I will never know and I wish not to know. A couple of days later Danka's finds ended up on their big family dinner table. They were turned into Penne with morels and cream sauce.

This year I have many new suggestions for Danka on how to collect and use every single piece of these delicious fungi specimens. I was told by many experienced Morel hunters that one should cut stems off and dehydrate them. Once well dehydrated, grind them into powder and use as flavoring for any dish you would like to infuse with Morel flavor. Maybe mix the Morel powder with salt. A little of this salt goes a long way.

Yes, I already talked to my sister about going back to the Morel spot. April is around the corner (or here as you read this.) How long before she reports to me that little pine cone mushrooms are back? I hope to see them in person soon and share my myco-fever with my dear sister in person.

Dana Belanova of Tesis di Vivaro (sister of Jana Harris - BMC member)

Medical Mycology: A Microscopic Foray

Kayleigh Watson

My name is Kayleigh Watson, a proud member of the BMC and when I am not searching for mushrooms, I am a microbiology medical technologist. What does this mean? I work in a diagnostic microbiology lab, isolating, identifying, and determining drug susceptibilities for infectious pathogens found in patient specimens. You've got an infection? I'll tell you what you've got and what drugs should work. The pathogens that cause disease in humans that we look for are bacteria, viruses, fungi, and parasites. The term medical mycology refers to this clinical work focused on fungi that cause disease. It is a vastly underappreciated and yet increasingly relevant field of clinical microbiology. As a member of this club and a passionate microbiologist, I can't help but ponder the similarities between these two aspects of my life.

As I learned more about mushrooms from this club, I was pleasantly surprised how the worlds of macro and micro collide in terms of identifying fungi. When out on a BMC foray, we use our senses to gather information so we can identify a mushroom in front of us. We note its size, shape, color, how it smells, what substrate it's growing on, etc. A dedicated forager even uses microscopy to examine spores. Medical mycologists use these exact same skills to identify fungi in clinical specimens.

We observe how colonies of fungal pathogens grow on different kinds of agars – think of agar for microbial colonies like the substrate for mushrooms. Different agars have different nutrients and sometimes drugs to inhibit or promote growth of certain pathogens. Some yeasts and molds only grow on one type of agar, some can grow on many. Depending on which agar they do and do not grow on can be a key first step in identification, just like identifying where a mushroom is growing, and which vegetation it is near.

Colors and textures of colonies of yeasts and molds are also hugely important in identification. Most yeasts are a creamy white color. Some yeasts, like Candida albicans, grows colony projections, or "feet". These projections spread all over the agar, extracting nutrients. They look eerily like mycelia spreading through soil or decaying wood. Penicillium and Aspergillus colonies are super fuzzy and often green with white borders.

Although taking a big whiff of mold colonies is highly ill-advised, sometimes in cultures of nonsterile sites, yeasts can be part of your normal microbiome and will grow alongside its

Photo by Anita Allison

bacterial buddies. Sometimes when you first open a plate, you can tell there will be an overgrowth of yeast because of the definite "yeast-y" smell that's released. Think freshly baked bread or an open can of beer. Speaking of smells, many bacteria have distinct smells too! Proteus species often smells to me like a freshly baked chocolate cake, although to some it smells like a barnyard. Pseudomonas aeruginosa smells strongly of grapes and ammonia. Micro-aerophilic streptococcus (only grows in environments high in CO2) smells extremely sweet, like butterscotch. Don't ask me how or why they smell the way they do, I just have to sit back, laugh, and appreciate the olfactory mysteries of the universe.

Microscopy is the basis of all microbiological work. We smear some of the colony we are interested in on a glass slide, and stain it so we can see different kinds of cells under the microscope. A common stain is the Gram Stain, although yeasts and fungi generally stain poorly using this method (they don't retain the dyes well, making it hard to see them in the slide). Some yeasts can be seen using a Gram Stain. Yeast cells are much larger than bacteria, are generally circular or oval. They stain purple using the Gram Stain. Yeast cells are also easily identified because they will be "budding", with a large parent cell starting to replicate and a daughter cell

separating from the parent cell. There are many staining methods used to view fungi, including some fluorescent microscopy (yeasts and fungi will appear to glow when certain colored light is shone through the slide). Lactophenol blue is particularly useful in viewing fungal structures such as the formation of hyphae and the sexual structures of fungi. The structure of conidia and conidiophores, as well as the presence or absence of pigmentation can specify genus and sometimes species. For example, Aspergillus fumigatus has uniseriate conidiophores in a fan shape, with individual conidia growing at the ends. Meanwhile, Penicillium species have long "finger" like cells with the conidia growing at the tips.

For both medical mycologists and mushroom foragers, the stakes are high; a wrong identification can literally be life or death for the forager and the patients. A detailed oriented and observant person makes for both a good mushroom hunter and microbiologist. Many of the skills you use to identify mushrooms in the field are what microbiologists use in the lab. As someone who works in a lab and forages for fun, I feel like I have a unique perspective on both. As different as the two fields may seem, one focusing on the macro and one on the micro, they are surprisingly similar! I also believe that both fields could learn from one another. Sometimes in microbiology, you can get caught up in the tiniest of details and lose the big picture. What do these results mean in the context of the patient? How are these microbes affecting the larger tissues and organ systems? I feel like mushroom foragers are excellent at using context to point them in the right direction for identification. On the other hand, I think sometimes mushroom enthusiasts can neglect their basic biology principles. Often, I have seen people jump right into identification or asking, "Can I eat this?", and while that might be enough for some people, I have always wanted to know the biological context. Understanding the biology and microbiology of how fungi grow and reproduce can really illuminate foragers on why mushrooms are the way they are – why and how they grow on different substrates, why certain mushroom forms are repeated throughout the entirety of the kingdom, and why we classify and organize fungi the way we do. A little micro knowledge can provide a strong basis for your macro knowledge to build upon. I highly recommend learning about fungal biology! Be ready for your mind to be blown.

While I know this club primarily focuses on macroscopic fungi and mushrooms, I ask that we don't forget or appreciate our microscopic fungal pals like yeasts and molds. Some can make you sick, but they're also responsible for antibiotic drug production, beer fermentation, cheese production, bread, and are important members of your own microbiome! If you couldn't tell, I am passionate about microbiology and could talk about this forever. If anyone has any questions or wants to converse about the microbial world, I can be reached by email at: watsonkay99@icloud.com.

Mushroom Cookery

Anna Seitz

My Approach to Mushroom Cooking

Preparations before cooking — Wipe with a wet towel if the mushroom is fairly clean. Wash, wash and wash if you need to, in order to remove sand and other unwanted debris. A water-logged mushroom is better than a sandy one. The water can be cooked away and the sand stays.

Cooking mushroom — Cook the mushroom till it is dry. ABSOLUTELY DRY!!!! This brings out the flavor in these 'flavorless' mushrooms. Never throw away the liquid that comes out when the mushroom is heated. Reduce it to nothingness and you will be rewarded with flavor.

Lipids — I usually start with oil. I like olive oil that has little or no flavor for cooking mushrooms. (The intensely flavored olive oils belong to my salad greens.) I love the taste of butter in my mushroom too, and I mean taste, so I add very little (about a tablespoon) of it to the mushroom at the end of cooking

Flavor additions — My rule: the more delicate the flavor the mushroom is the milder the additional flavoring. The flavoring should be supportive of the mushroom itself, and never overpower it. My most frequent flavor additive is allium.

Garlic (Allium sativum): This is a great allium. Treat it gently, with respect, and it will purr for you. The flavor of garlic is based on an enzyme reaction. When the garlic cell is damaged by cutting or smashing, it releases an enzyme which reacts …….. and release the garlic flavor. So the finer the mince, or the harder the smash, the more flavor ensues. I like a fine mince, sometimes preceded by a soft smash. (Also, I do not like to let my minced or smashed garlic sit for more than 10-15 minutes.) I cook the minced garlic gently on low heat in oil till it takes on a slight color. It should become very fragrant. You can let it go a little further, but do not let it go to dark brown or black. (Throw it all out if it got burnt – too bitter.)

If I am cooking a delicate mushroom, like the little chanterelles, I skip the garlic and go for the gentle shallot (Allium cepa var. ascalonicum). If I need to extend the mushroom dish, I pick up the onions (Allium cepa), chop it and brown it before adding the minced garlic. For last minute

additions, there is always chives (Allium shoenoprasum), garlic chives (Allium tuberosum) and Scallion / green onions (Allium fistulosum)

Recipes for the Mushroom Dishes at the Foray

Matsutake (Tricholoma magnivelare) — This mushroom has a distinctive and intense flavor. In order to keep the flavor true to the mushroom, I sautée the sliced Matsutake using the garlic flavored olive oil (see above), till the liquid that it emitted when it was cooked has evaporated. Before the liq-

uid is totally gone, I added a tablespoon of butter and tossed the mushroom till done.

Gypsy (Cortinarius caperata, old name - Rozites caperata) — The gypsy is much milder than the matsutake. I cooked it the same way as the matsutake, but I added minced parsley to it. At the very end they were a little too oily. I added a little toasted bread crumbs to absorb the oil-butter.

Red-capped Scaber Stalk (Leccinum aurantiacum) — We had gobs and gobs of this mushroom this year at the Cape. It emitted a lot of liquid when heated. Cooking it is a test of patience. In order to hurry the process, most of the liquid was removed to another pan and reduced at a hard boil. The reduction was added back to the pan of leccinum. Butter was added in the final step.

Sandy Laccaria (Laccaria trullisata) — This I did not have time to cook at the Cape. I did take home some to try. It was deemed by many to be too sandy to bother with. The root part of the Sandy Laccaria was attached to sand. I peeled it off with a paring knife. To remove the sand from the rest of the mushroom, I used the same technique I use for sandy vegetables. They all went into a vat of water and swished till no more sand drop to the bottom of the container. I cooked them as usual and they were good. I am looking forward to more Sandy Laccaria at the Craigville forays next year.

These thoughts were engendered by the Mushroom Foray weekend at Craigsville, and this piece was originlly published in the Boston Mycological Club Bulletin in 2011 (Volume 66 No. 4, page 2).

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Postcards Home: Telluride, Colorado's Amazing Mushroom Festival

Gary Gilbert

What kind of weird thing on Earth is a Mushroom Festival one might ask? Well, there are Garlic Festivals, Apple Festivals and Tulip Festivals, so why not one for mushrooms?

Mind you, it is not just a gathering of hippies and alternative medicine people. Rather it has been going on for 42 years and this year attracted more than 800 people from all over the world, from Siberia to Florida to Chile. It brings together serious scientists from Nobel Prize laureates to doctors, chemists, writers, businesspeople and various other professionals.

Many of the attendees represent decades in mycology (the study of mushrooms) and want to try to make the world a better place through the use and scientific study of fungi.

Its roots lie in 1981, when Beth Israel Hospital hosted a conference in Aspen, focusing on the clinical treatment of mushroom poisonings. Following this, mycologists such Gary Lincoff, author of the Audobon Guide to North American Mushrooms, Paul Stamets, owner of the large Oregon-based company "Fungi Perfecti" and Manny Salzman, a radiologist and expert on mushroom poisonings, decided to organize a regular mycology event deep in southwestern Colorado.

Of course, they also liked to party together, but that was not the main idea behind their efforts. The study of mushrooms does, after all, lend itself to good food, fermented beverages and sometimes some psychoactive fungi thrown into the mix, right?

Telluride, Colorado is a charming historic mining town locked into a panoramic box canyon surrounded on three sides by towering mountains. Telluride is also very close to lots of high-elevation forests and meadows which are easily (or difficultly) accessible by interesting, and sometimes rather challenging, dirt logging roads. They may be rocky, bouncy, twisty and turny, with the occasional sheer cliff thrown in, but they'll get you there.

This clever couple portrayed a Stinkhorn mushroom (lady, right) with her accompanying fly, attracted to her.

This southwestern part of the state also receives late summer monsoon rains which activate fungal production. The elevations are quite high, from around 9,000 to 11,500 feet and filled with gigantic panoramas of mountain vistas that never seem to end. Those elevations often get one above the aspen tree zone and into pure spruce and fir forests, trees that have unique relationships with a specific variety of fungi.

With phrases like, "Mushrooms have the potential to revolutionize our relationship with the world and ourselves," this year's festival saw an assemblage of therapists, forest pathologists, edible fungi cultivators, polluted habitat restorers, DNA analysts, taxonomists, brewers, journalists, chefs, photographers, artists and vendors.

A wide range of topics were lectured on, not the least of which was the currently popular topic of Psilocybe mushrooms and their increasing use in psychotherapy for people suffering from all sorts of ailments, from PTSD to end-of-life care, fighting addiction, treatment-resistant depression and chronic pain.

This clever couple portrayed a Stinkhorn mushroom (lady, right) with her accompanying fly, attracted to her. Photo courtesy of Gary Gilbert.

There were lectures on everything else, including sequencing DNA, myco-remediation (using fungi to decompose polluted lands), mushroom cultivation, the use of microscopes in taxonomy, identification of mushrooms of the Rocky Mountain region, cultivating medicinal mushrooms, cooking demonstrations, myco-technologies (such as making paper, packaging material and structural building elements from mycelium), analysis of the genome of the Porcini family, fungal spore release mechanisms, conservation of trees and fungi in the Amazonian rainforest and hunting fungi in the Himalayan mountains.

From Russia, there was a presentation on a well-researched new book coming out about the medicinal applications of Amanita muscaria, the famous red mushroom with white dots, including micro-dosing and topical pain relief treatments. This was based on studies done in Siberia with over 3,000 participants. It is the first time a serious book from Russia has been written concerning the medicinal use of very small doses of this powerful hallucinogenic either internally, or as a topical cream for pain. In fact, this mushroom has been used and experimented with for a variety of medicinal purposes for centuries in the region of Siberia.

This truck, decorated to look like an "Amanita" mushroom, has been a mainstay in previous festival parades. The truck no longer runs, so it is pushed all the way down Main St each year!

On a lighter note, there were forums on cooking with mushrooms (mycophagy") of which I was a participant, and on every day of the five-day event at least four different guided walks in the mountains were offered by local experts. There was also the annual Poetry Slam with theater, very creative performances, poetry and song along with a bar serving myco-beers, and mushroom-based beverages. Finally, on Saturday afternoon, the annual mushroom parade was held. Each year an award is granted for the best costume.

This 3-person Porcini costume with a knife-man ready to slice it open won for Best Costume this year. Photo courtesy of Gary Gilbert.

This year a giant porcini won the prize complete with a few fabric worms hanging off of his cap. There were also entertaining costumes such as the Stinkhorn lady with her accompanying companion, a black fly circling around her. There were various Chanterelle Ladies, Ganoderma men (mostly just with funny hats), and the parade ended in a giant drumming circle that went on late into the evening and various dinner parties ensued, scattered throughout town. So why did I go to this obscure, odd and interesting event? Well, for me, it's primarily about collecting the huge fruitings of Colorado's Porcini harvest, which mycologists correctly say yields the best-tasting Porcinis in North America.

Last year I returned with more than two dozen gallons dried Porcinis. This year, only one. But hey, the mushroom harvest always varies due to weather and the comradery with other mycologists and the joy of the hunt is what brings many participants.

As they say in the fishing world, "it's called fishing, not catching." So, I attend for the joy of the hunt, the sharing of information and scientific curiosity, and to enjoy the sheer magnificence of the state of Colorado. And to my mind, those are some pretty good reasons.

Mushrooms

Larry Rappoport

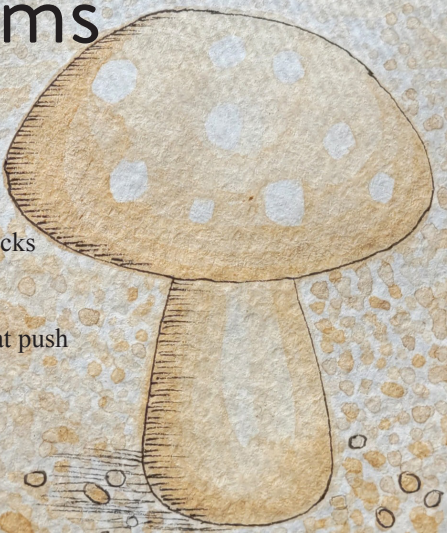
The very old at bus stations
Are all aware of each other
And even hear trees
In the dark network

Of bacteria at work
Chipping everything into blocks
Making decisions too grand

And slow for even the slugs
And the ends of the twigs that push

Out into the air
To feel grateful until the bus
Finally comes, and the doors

Don't even have to open
Because the mushrooms
Know what's coming.



"It's a small watercolor mushroom, with ink I made from cinnabar polypore (Pycnoporus cinnabarinus) and the viscid violet cort (Cortinarius iodes). Detail with pen." - Artist Natalie Tessicini

A 1998 painting of BMC member Julian Kan by her then-boyfriend, now-husband, Anthony D.