

FROM THE EDITOR



Merismodes anomala, a cyphelloid basidiomycete; photo: Tom Bigelow

This winter has seen a lot of activity with the New York Mycological Society. With few exceptions, we have been out every weekend since November. On almost every walk, we have found the mushroom pictured above, *Merismodes anomala*. *Merismodes* is one of my favorite mushrooms, in part because it is the first cyphelloid fungus Tom and I found, and identified (in the Central Park ramble, February, 2015). The cyphelloids are a group of mushrooms which have the cup-like appearance of an ascomycete, but are actually basidiomycetes. The terms

ascomycete and basidiomycete refer to the sexual reproductive systems of a fungus. Ascomycetes forcefully eject their spores from sac-like asci, and basidiomycetes drop their spores from fork-like basidia. Therefore, an ascomycete cup-like fungus will face upward to enable this forceful ejection of spores, and a basidiomycete cup-like fungus will face downward to allow the spores to drop from the basidia. As you can see from the picture above, the *Merismodes* fruiting bodies are very hairy. These hairs are a key feature for identification. We have two *Merismodes* species in our area,

anomala and *fasciculata*. *M. anomala* has some hairs with a curved, inflated cell at their tip, resembling a snake head, and *M. fasciculata* has smaller, smoother hairs.

In order to identify the species of the *Merismodes* we have been finding in almost every park in every borough, we have been looking at the hairs of these fruiting bodies under the microscope during ID nights. Until one recent ID night, every specimen we have scoped, has had the hairs with snake heads, indicating *M. anomala*. On December 15, 2018, in a walk in Prospect Park, we brought home four different collections of *Merismodes*. We looked at three of these collections, two of them appeared to be *M. anomala* with the snake heads, and the other appeared to be *M. fasciculata* with smooth, thick walled hairs!

On March 25, as you will read in the pages enclosed, Greg Thorne will be giving a lecture focused on the cyphelloid fungus. I am very much looking forward to finding out if we are identifying this fascinating mushroom correctly!

On another note, I am honored to introduce with this issue of the newsletter, our new Book Review editor, Mical Moser. Mical brings many years of experience in book publishing, and I think we will all benefit from her expertise. I hope you enjoy the many book reviews included in this issue as much as I do...

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UPCOMING EVENTS

July 26 – 28: Chanterelle Weekend, Green Mountains, VT
October 4 – 6: Catskill Weekend

Eagle Hill Workshops, 2019

May 19 – 25: Lichens and Lichen Ecology - Troy McMullin
May 26 – Jun 1: Old-growth Forest Lichens and Allied Fungi, with a Focus on Calicioids - Steven Selva and Troy McMullin
May 26 – Jun 1: Introduction to Bryophytes and Lichens - Fred Olday
Jun 16 – 22: Independent Study: Topics in Fungal Biology - Donald Pfister
Jul 28 – Aug 3: Mushroom Identification for New Mycophiles: Foraging for Edible and Medicinal Mushrooms - Greg Marley and Michaeline Mulvey
Aug 11 – 17: Crustose Lichens, Accessory Fungi, and Symbiotic Transitions - Toby Spribille
Aug 11 – 17: Lichens, Biofilms, and Stone - Judy Jacob and Michaela Schmull
Aug 18 – 24: Mushroom Microscopy: An Exploration of the Intricate Microscopic World of Mushrooms - David Porter and Michaeline Mulvey
Sep 27 - 29: Fall Maine Mushrooms - David Porter and Michaeline Mulvey

Forays

August 1 – 4: 2019 NEMF Samuel Ristich Foray; 43rd Annual Foray of the Northeast Mycological Federation, Lock Haven University, PA
August 8 – 11: 2019 NAMA Annual Foray, Paul Smiths, New York



NYMS Newsletter

Editor—Juniper Perlis
Copy editor—Ethan Crenson
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President—Tom Bigelow
Vice President—Dennis Aita
Secretary—Paul Sadowski
Treasurer—Kay Spurlock
Walks Coordinator—Dennis Aita
Lecture Coordinator—Tom Bigelow
Study Group—Paul Sadowski
Archivist—Ralph Cox
Reviews Editor—Mical Moser
Webmaster—Ethan Crenson
www.newyorkmyc.org

Articles should be sent to:
Juniper Perlis
713 Classon Ave, Apt 505
Brooklyn, NY 11238
juniperperlis@yahoo.com
347.743.9452

Membership inquiries:
Kay Spurlock—Treasurer-
New York Mycological Society
P.O. Box 1162 Stuyvesant Sta.
New York, NY 10009
KSpur98@aol.com

Address corrections:
Paul Sadowski
205 E. 94 St., #9
New York, NY 10128-3780
pabloski1@verizon.net

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Archive copies of the newsletter are available in the Resources section of our website.

Submissions for the next issue of the NYMS newsletter must reach the editor by June 15, 2018. Various formats are acceptable for manuscripts. Address questions to Juniper Perlis, editor. See above for addresses.

A Message from our Reviews Editor

For three years now I've been a member of the New York Mycological Society. Something that's become clear is this: as a community, our knowledge is only as good as our resources. While there are many excellent digital resources available to mycophiles, I have always been charmed by how much fungal knowledge is bound up in books (that is *real* books; physical books). My professional life revolves around books, and you can always count on me to cheer on the good ones. A number of months ago, I offered to our newsletter editor, Juniper Perlis, that it would be nice to have more book reviews, and I could help shepherd them along. If any of you are interested in writing reviews, or if you have written a book that you'd like reviewed or noted, please let me know.

–Mical Moser
Reviews Editor
micalmoser@me.com

Chanterelle Weekend 2019

July 26-28, The Green Mountains of Southern Vermont

After two years of organizing the splendid NYMS Chanterelle Weekend, Ethan Crenson is taking a respite, and Dorota Kolodziejczyk and Jason Duval will organize, with support offered from Laura Biscotto and Adrienne Haerberle.

As we send this issue of the newsletter to press, the details of the house rental and other specifics are still in the works. However the weekend dates are set for July 26 – 28th, the weekend before the NEMF Samuel Ristich Foray.

A deposit of \$50.00 should be submitted along with the registration form at the back of this newsletter issue before June 1. Please make checks out to NYMS.

Mail both the form and the check to:

Laura Biscotto
9 Stanton St, Apt 2C
New York, NY 10002
212 677 3060
labisco3@gmail.com



Paul Sadowski with *Leccinum* and wine at the 2018 Chanterelle Weekend in Stratton, VT
photo by Vicky Tarttar

Remember!

Stay responsibly in touch with us. If your telephone number, mailing or email address changes, please contact Paul Sadowski, Secretary with your new information. On your membership form, please consider going paperless when it comes to receiving these newsletters. Newsletters sent via email (PDF file format) are in color, have live web links, help us contain costs, and use fewer natural resources!

NYMS walks policy: We meet when public transportation arrives. Check the walks schedule for other transportation notes. Walks last 5-6 hours and are of moderate difficulty except where noted. Bring your lunch, water, knife, a whistle (in case you get lost or injured), and a basket for mushrooms. Please let a walk leader know if you are going to leave early.

Leaders have discretion to cancel walks in case of rain or very dry conditions. Be sure to check your email or contact the walk leader before a walk to see if it has been canceled for some reason. Nonmembers' attendance is \$5 for an individual and \$10 for a family.

We ask that members refrain from visiting walk sites two weeks prior to the walk.

Warning: Many mushrooms are toxic. Neither the Society nor individual members are responsible for the identification or edibility of any fungus.



Else Vellinga



Greg Thorn



Rod Tulloss



Nova Patch

2019 Emil Lang Lecture Series

The NYMS Emil Lang Lectures for 2019 will be held on Monday nights, from 6:00-8:00, at the Central Park Arsenal. The entrance is just off 5th Ave. at 64th St.

The Arsenal, Central Park
830 5th Ave., Rm 318 (@ 64th St.)
New York, NY 10065

The lectures are free and open to the public.

February 25th: **Else Vellinga**, “Fungal Conservation”

Else Vellinga is a mycologist who is interested in naming and classifying mushroom species in California and beyond, especially Parasol mushrooms. She has described 22 species as new for California, and most recently worked at the herbaria at University of California at Berkeley and San Francisco State University for the Macrofungi and Microfungi Collections Digitization projects. She got her training at the National Herbarium in the Netherlands, and her PhD at the University of Leiden, also in the Netherlands. The main motivation for her taxonomic work is that it lays the basis for efforts to include mushroom species in nature management and conservation plans. She has proposed a number of Californian and Hawaiian species for the IUCN global database of endangered species. She tries to keep current with the mushroom literature. And lastly, Else is an avid knitter and likes to use mushroom dyed yarn for her creations. She lives with her two cats in Berkeley, California.

March 25th: **Greg Thorn**, “Explorations of Cyphelloid Fungi (and other Wee Mushrooms) in the Molecular Age”

Greg Thorn grew up in London, Ontario and became interested in natural history through the family garden, long summer vacations, and the local Field Naturalists group. Six summers as a naturalist in Algonquin Park built on this and introduced him to the world of mushrooms and other fungi. Mushroom forays of the Mycological Society of Toronto and NAMA were an important part of his training, where he met and learned from the likes of Gary Lincoff, Ron Petersen, Alex Smith, and many more. Writing the checklist of Algonquin Park macrofungi led Thorn to consult experts from Richard Korf to Jim Ginns and Scott Redhead, all of whom encouraged him to further studies of fungi. His graduate studies were at the University of Guelph (with George Barron) and the University of Toronto (with David Malloch), followed by positions in Japan, Michigan, Indiana, Wyoming, and finally back to London as a faculty member in the Department of Biology, University of Western Ontario. Thorn’s research is focused on the impact of disturbance on the diversity of mushroom fungi, and systematics of mushroom fungi generally.

April 29th: **Rod Tulloss**, “Amanita with a Hand Lens and the Naked Eye: Communicating About Unfamiliar Finds Using the Seven Sections Recognized by Dr. Cornelis Bas”

Rod Tulloss has specialized in Amanitaceae for 42 years, having been mentored by the late Dr. Cornelis Bas (Leiden). His research is available through an expanding, open-access, on-line monograph, “Studies in the Amanitaceae” founded by him and co-edited with Dr. Zhu L. Yang (Kunming). The site treats over 1,050 taxa and includes a peer-reviewed e-journal (“Amanitaceae”) restricted to research associated with the herbarium and/or its staff. He is currently working on Amanita sect. Vaginatae for North America; the Boston Harbor Islands fungal inventory; providing support for individuals and clubs working on Amanita sequences via North American Mycoflora grants; providing interactions and teaching moments on mushroomobserver.org and on the Amanita of North America facebook group, etc. He maintains an extensive private herbarium of world Amanitaceae. Visit his website: <http://www.amanitaceae.org>

May 20th: **Nova Patch**, “Urban Lichens of New York City”

Nova Patch is an amateur lichenologist focusing on the urban lichens of NYC and curator of the open data project Lichens of New York City on iNaturalist. They are a regular speaker on diverse topics ranging from lichenology to emoji engineering, hold a botany certificate from the New York Botanical Garden, and are a Brooklyn-residing member of the New York Mycological Society. Nova will lead a city lichen walk the weekend following their talk.

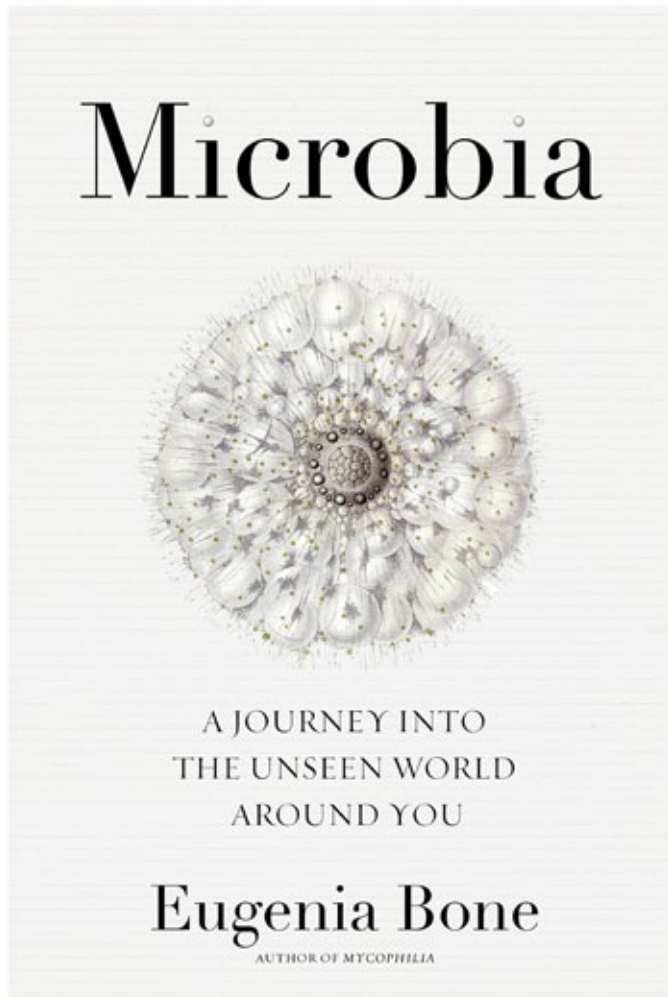
Microbia

A Journey into the Unseen World Around You

By Eugenia Bone

2018 Hardcover 272 pp. Rodale 9781623367350 \$25.99

Book Review by Mical Moser



hyper-competent young adults and equally impressive microscopic organisms.

Previously, “fungus” was the answer to any question I ever asked. But Bone has lifted a veil. What’s the REAL apex predator on the planet? Bacteria. What digests most of the food you eat? Bacteria. What protects your ears from infections? Bacteria. What’s all over everything and let’s just accept it? Yes, indeed, the answer is bacteria. And if the answer isn’t bacteria, it’s probably bacterial-fungal interaction. As in why, when antibiotics cure what ails you, does another malaise sometimes pop

sterility. Bacteria is a necessary and healthy part of a clean environment; sterility is not. You may want sterility in your sealed jar of mushroom duxelles (for which you can go to another of Bone’s books, *Well-Preserved: Recipes and Techniques for Putting up Small Batches of Seasonal Food*), and you may want sterility on your surgeon’s scalpel, but bacteria are a necessary part of our living environment. We eat it in yoghurt. We swap it with all of our loved ones and friends. We share it with a community of 10 million New Yorkers and countless tourists who’ve also put their hands on our subway car pole. Our skin is amazingly adept at maintaining a correct bacterial balance throughout. The trick with bacteria isn’t to get rid of it, but to help bacteria maintain the right equilibrium and stay in the right place (all E. coli back to the intestine please!). So while you read Bone’s book, smell the ink, touch the pages, and while you’re at it, go ahead and enjoy a cheese plate! Kiss everyone on both cheeks à la française! Clink glasses with strangers at the table! Santé!

The newest book from past NYMS president, Eugenia Bone, is *Microbia: A Journey into the Unseen World Around You* (Rodale). It is to bacteria what her last book, *Mycophilia*, was to mushrooms: a readable, delightful, fact-filled tour. (You know *Mycophilia*, right? If not, it’s time to take a personal day and catch up on your reading.) Bone always immerses herself in her subject and with *Microbia*, she goes so far as to take science classes at Columbia so that we don’t have to. The world that emerges is filled with

up? The answer (as you’ve probably guessed) is that you’ve thrown off the equilibrium of your body’s bacterial-fungal interaction.

I don’t want to give you the impression that Bone’s book is all about infections, disease, and laboratories. To the contrary. Her subtitle could have been “How I Stopped Worrying and Learned to Love Bacteria.” It’s a fascinating, feel-good celebration of germs. One of the great joys of reading *Microbia* was that it helped me recognize the difference between cleanliness and



Eugenia Bone; photo © Huger Foote

How to Change Your Mind

by Michael Pollan

2018 Hardcover 480 pp. Penguin 9781594204227

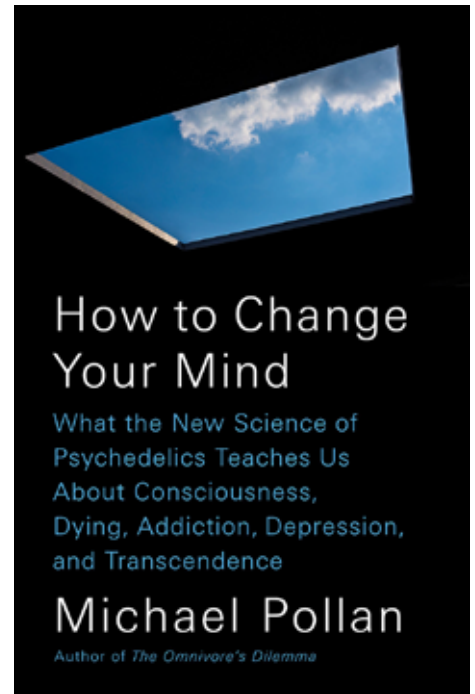
Book Review by Leah Krauss

Michael Pollan offers three anecdotes to explain how he found himself writing a book on psychedelics. First, in 2010, Pollan came across a front-page story from the *New York Times*, “Hallucinogens Have Doctors Tuning In Again,” which reported that Johns Hopkins, UCLA, and New York University were dosing terminally ill cancer patients with psilocybin (the psycho-active compound in “magic mushrooms”) to alleviate “existential distress” among the dying. Pollan wondered at the logic of these studies and was surprised to read that “many of the volunteers reported that over the course of a single guided psychedelic ‘journey’ they reconceived how they viewed their cancer and the prospect of dying. Several of them said they had lost their fear of death completely” (8). Sometime later, he found himself at a dinner party where a psychologist mentioned using LSD as a means to consider children’s perceptions of the world. When asked if she would ever publish her observations, she dismissed Pollan as politically naive. As a professional, she was not going to publicly discuss taking psychoactive drugs. And finally, post dinner party, Pollan recollected an unopened email from 2006, a study in *Psychopharmacology* from Johns Hopkins, “Psilocybin Can Occasion Mystical-Type Experiences Having Substantial and Sustained Personal Meaning and Spiritual Significance” (10). This study, which Pollan attributes to the beginning of a “renaissance of psychedelic research,” is the first of many studies focused not on the specific pharmacological effect of a drug, but rather on “the kind of

mental experience it occasions.” And so, a popular writer best known for writing about human culture and food, embarks on an in-depth exploration of two Schedule One drugs, Psilocybin and LSD. In focusing on the social history and present research of these particular compounds, Pollan notably sidesteps the growing pervasiveness of ayahuasca rituals in the United States and the popularity of MDMA, an amphetamine often used in psychedelic therapy, and a compound with its own body of research and medical trials. Pollan’s book, at four hundred plus pages, is no less thorough for these omissions.

Pollan writes with a gentle but interrogative curiosity. His book is structured first around the histories of scientific interest in psilocybin and LSD, followed by Pollan’s own exquisitely described psychedelic “journeys” facilitated by underground guides. (He was ineligible for the university-based studies). He then wades through tidal pools of neuro-imaging research and offers a basic read of what happens to the mind on psychedelics. The book winds down with evocative stories of clinical trials of the dying, the addicted, and the depressed. For the purposes of this review, I will glance along the surface of the history and dip a toe into the neurobiology. The book is in fact unwieldy in the various ideas it puts forward and perhaps most appealing in its patient testimonials, which I have not included here out of concern for the length of this review.

Pollan places considerable attention on the story of psychedelics and the medical establishment over the second half of the 21st century. His chapter on LSD, in particular,



diligently and with deceptive ease, charts a complicated debate across the Coastal United States, Saskatchewan, other parts of Canada, and parts of Europe. LSD was synthesized in 1938 by Swiss Chemist Albert Hoffman, and accidentally ingested by him for the first time in 1943, five years later. He self-dosed epically, in what Pollan describes as the first “bad trip” in recorded history. Uncertain of how to make sense of the seeming madness and transcendence of that self-dosing, Hoffman was certain that the chemical could be put to medical use. Sandoz, the pharmaceutical company that employed Hoffman, distributed LSD freely to any scientific study that would document findings. Many labs and enterprising individuals rose to the challenge. The drug was initially conceived of as a psychotomimetic (a replicator of psychosis), then as a psycholytic, a truth serum of sorts, and finally as its own distinct category of “mind-manifesting” (the meaning of “psychedelic”) experience. At each stage, scientists hypothesized the chemical action on the mind and at each stage, it seemed close but not representative of what was happening in the experience. One example of this phenomena took place in 1953, in a study

put forward by Humphrey Osmond and Abraham Hoffer at their clinic in Saskatchewan, in which the clinicians offered volunteers a high dose of LSD as a mimetic of intense withdrawal from alcohol. Pollan writes, “Here was an arresting application of the psychotomimetic paradigm: use a single high-dose LSD session to induce an episode of madness in an alcoholic that would simulate delirium tremens, shocking the patient into sobriety.” For the following ten years, “Osmond and Hoffer tested this hypothesis on more than seven hundred alcoholics, and in roughly half the cases, they reported, the treatment worked: the volunteers got sober and remained so for at least several months. Not only was the new approach more effective than other therapies, but it suggested a whole new way to think about psychopharmacology. ‘From the first, Hoffer wrote, ‘we considered not the chemical, but the experience as a key factor in therapy.’ This novel idea would become a central tenet of psychedelic therapy” (149). In spite of the treatment’s success, in cataloging their data, the therapists noted a high discrepancy between the subjective experience of LSD and the horrors of DTs. In the reports “‘psychotic changes’ - hallucinations, paranoia, anxiety – sometimes occurred, but there were also descriptions of, say, ‘a transcendental feeling of being united with the world,’ one of the most common feelings reported. Rather than madness, most volunteers described sensations such as a new ability ‘to see oneself objectively’; ‘enhancement in the sensory fields’” etc. “In spite of the powerful expectancy effect, symptoms that looked nothing like those of insanity were busting through the researchers’ preconceptions” (150).

Regardless of the theoretical model underpinning the treatment, “by the end of the decade, LSD was widely regarded in North America as a miracle cure for alcohol addiction” (151). As this episode illustrates, psychedelics shifted the mental health

conversation back toward patients’ interior experience, rather than on what could be externally observed. “The emphasis on what subjects felt represented a major break with the prevailing ideas of behaviorism in psychology, in which only observable and measurable outcomes counted and subjective experience was deemed irrelevant” (149). Additionally, the realization that “LSD affected consciousness at such infinitesimal doses” “helped to advance the new field of neurochemistry in the 1950s, leading to the development of the SSRI antidepressants” (293). Stephen Ross, an addiction researcher at Bellevue, later shared with Pollan his astonishment at learning this history after his formal education, “‘Beginning in the early fifties, psychedelics had been used to treat a whole host of conditions’ including addiction, depression, obsessive-compulsive disorder, schizophrenia, autism, and end-of-life anxiety. There had been forty thousand research participants and more than a thousand clinical papers! ... Some of the best minds in psychiatry had seriously studied these compounds in therapeutic models, with government funding.’ But after the culture and the psychiatric establishment turned against psychedelics in the mid-1960s, an entire body of knowledge was effectively erased from the field” (142).

One of the features of present psychedelic medicine that Pollan draws attention to is that the substance, be it psilocybin or LSD, is not thought to be sufficient to produce the desired results. Regardless of how people are altered by these drugs recreationally, the most efficacious studies of the past, and essentially all research trials under discussion, are preoccupied with a therapeutic relationship in addition to the application of a drug. Michael Pollan follows the breadcrumbs to the original medical application of “Set and Setting.” A term attributed to Timothy Leary, “Set and Setting” was conceptually applied prior to Leary’s work, notably

by underground guide, Al Hubbard, in collaboration with Osmond and Hoffer at their clinic in Saskatchewan. In the 1950s, psychedelic therapy “typically involved a single, high-dose session, usually of LSD, that took place in comfortable surroundings, the subject stretched out on a couch, with a therapist (or two) in attendance” quietly allowing the journey to unfold. “To eliminate distractions and encourage an inward journey, music [was] played and the subject usually [wore] eyeshades. The goal was to create the conditions for a spiritual epiphany – what amounted to a conversion experience” (163). Participants were given a set of “flight instructions,” that encouraged them to go deeper into the experience with assurances that guides would serve as “ground control” for the duration of the “trip.” Guidance of this sort shaped the larger contours of the psychedelic journey, with doctors encouraging self-transcendence (an ineffable experience highly correlated with long-lasting results). Clinician as spiritual guide does appear to be an essential part of past and present “trip treatment.”

Pollan shares a few quotes by Dr. Sydney Cohen, from an essay published by *Harper’s* in 1965, where Cohen writes on the potential of psychedelics for the dying. Cohen invokes treatment with LSD as “‘therapy by self-transcendence.’ The premise behind the approach was that our fear of death is a function of our egos, which burden us with a sense of separateness that can become unbearable when we approach death. ‘We are born into an egoless world,’ Cohen wrote, ‘but we live and die imprisoned within ourselves. ... We wanted to provide a brief, lucid interval of complete egolessness to demonstrate that personal intactness was not absolutely necessary, and that perhaps there was something ‘out there’ something greater than our individual selves that might survive our demise.’” Cohen shares the words of one patient, dying of ovarian cancer,

who states, “My extinction is not of great consequence at this moment, not even for me. It’s just another turn in the swing of existence and non-existence. ... I could die nicely now – if it should be so. I do not invite it, nor do I put it off” (339). Similarly, present day NYU psychiatrist Jeffrey Guss “speaks explicitly about the acquisition of meaning, telling his patients, ‘that the medicine will show you hidden or unknown shadow parts of yourself; that you will gain insight into yourself and come to learn about the meaning of life and existence. ... As a result of this molecule being in your body, you’ll understand more about yourself and life and the universe” (354). Pollan concludes, “And more often than not this happens. Replace the science-y word ‘molecule’ with ‘sacred mushroom’ or ‘plant teacher,’ and you have the incantations of a shaman at the state of a ceremonial healing” (354). Jeffrey Guss is optimistic that psychedelics might offer a paradigm shift for psychotherapy. He points out that “for many years now ‘we’ve had this conflict between the biologically based treatments and psychodynamic treatments. They’ve been fighting one another for legitimacy and resources. Is mental illness a disorder of chemistry, or is it a loss of meaning in one’s life? Psychedelic therapy is the wedding of those two approaches” (335).

But how to understand what is happening to the brain, over the course of a psychedelic session? Michael Pollan looks to a team at the Centre of Psychiatry on the Hammersmith campus of Imperial College in West London for a promising and still preliminary understanding. This team, led by neuroscientist Robin Carhart-Harris, uses scanning technologies such as functional magnetic resonance imaging (fMRI) to observe people injected with a high dose of psilocybin or LSD. Both molecules have an affinity with “one particular type of serotonin receptor called the 5-HT_{2A}. These receptors are found in large numbers in the

human cortex, the outermost and evolutionarily most recent layer of the brain” (292). This appreciation of receptor sites doesn’t explain much about the “phenomenology” of a brain subjected to psychedelics. To that end, Carhart-Harris’s team is interested in what is called the “default mode network,” (DMN) a “network of brain structures that light up with activity when there are no demands on our attention and we have no mental task to perform. ... Working at a remove from our sensory processing of the outside world, the default mode is most active when we are engaged in higher-level ‘metacognitive’ processes such as self-reflection, mental time travel ... moral reasoning, and ‘theory of mind’ - the ability to attribute mental states to others, as when we try to imagine ‘what it is like’ to be someone else” (302). The adult brain, according to Carhart-Harris, is “a hierarchical system,” in which “‘The highest-level parts’ - those developed late in our evolution, typically located in the cortex - ‘exert an inhibitory influence on the lower-level [and older] parts, like emotion and memory” (303). In Carhart-Harris’s first experiment, “the steepest drops in default mode network activity correlated with his volunteers’ subjective experience of ‘ego dissolution.’ (‘I existed only as an idea or concept,’ one volunteer reported. Another recalled, ‘I didn’t know where I ended and my surroundings began.’) The more precipitous the drop-off in blood flow and oxygen consumption in the default network, the more likely a volunteer was to report the loss of a sense of self” (305). While the default mode networks go quiet, the limbic regions involved in emotion and memory, are disinhibited, which might explain why “material that is unavailable to us during normal waking consciousness now floats to the surface of our awareness, including emotions and memories and, sometimes, long-buried childhood traumas” (307). The DMN also “helps regulate what is let into consciousness

from the world outside,” the brain filtering “the torrent of information the senses make available” at any given moment (307) to a measly and manageable “trickle.” Neuroscience often conceptualizes the brain as a prediction-making machine. Pollan observes that this model “suggests that our perceptions of the world offer us not a literal transcription of reality but rather a seamless illusion woven from both the data of our senses and the models in our memories” (308). This “handshake between the data of our senses and our preconceptions” is firm, due to a “continual process of reality testing” (308). According to Carhart-Harris, psychedelics “render the brain’s usual handshake with perception less stable and more slippery. The tripping brain may ‘slip back and forth’ between imposing its priors and admitting the raw evidence of its senses” (310). This can explain hallucinations, or that people who are color-blind “report being able to see certain colors for the first time” or that people “hear music differently... they process the timbre, or coloration, of music more acutely – a dimension of music that conveys emotion” (310). Using a scanning technique called magnetoencephalography, the Imperial College team has shown that under the influence of psilocybin, “thousands of new connections form, linking far-flung brain regions that during normal waking consciousness don’t exchange much information. ... The increase in entropy allows a thousand mental states to bloom, many of them bizarre and senseless, but some number of them revelatory, imaginative, and, at least potentially, transformative” (318). Pollan adds, “In this sense, entropy in the brain is a bit like variation in evolution: it supplies the diversity of raw materials on which selection can then operate to solve problems and bring novelty into the world” (319). Carhart-Harris makes the point that many psychological “disorders” are not the result of a lack of order in the brain but rather from an excess of order. “When

the grooves of self-reflective thinking deepen and harden, the ego becomes overbearing” (312). In Pollan’s later observations about successful clinical trials among the depressed, the addicted, and the dying, he notes that these conditions, “all are exacerbated by the tyranny of an ego and the fixed narratives it constructs about our relationship to the world. By temporarily overturning that tyranny of an ego and throwing our minds into an unusually plastic state ... psychedelics, with the help of a good therapist, give us an opportunity to propose some new, more constructive stories about the self and its relationship to the world, stories that just might stick” (368). He adds, “This is a very different kind of therapy than we are accustomed to in the West, because it is neither purely chemical nor purely psychodynamic – neither mindless nor brainless. Whether Western medicine is ready to accommodate such a radically novel – and ancient – model for mental transformation is an open question” (368).

Pollan holds a measured optimism that the present “doors of perception” won’t swing shut. He expresses cautious hope that with a greater body of research and legitimacy around psychedelic therapies, the positive effects of these drugs can issue forth without a backlash of the sort that occurred in the 1960s. With regard to that youth rebellion, he holds that a generation was encountering, via psychedelics, a transformative experience with no elders or formalized coming of age ritual. Many of the people who lived through those turbulent times are now in positions of authority and have a more nuanced relationship to psychedelics than their predecessors. Toward the end of the book, Pollan relays a small portion of a “Future of Psychedelic Psychiatry” panel from 2017. On that panel was Paul Summergrad, MD, the former head of the American Psychiatric Association, next to Tom Insel, MD, the former head of the National Institute of Mental Health. The moderator was

George Goldsmith, “an American entrepreneur and health industry consultant based in London” (398). During that conversation, Insel said, “I’m really impressed by the approach here. People don’t say, simply, we’re gonna give psychedelics. They talk about ‘psychedelic-assisted psychotherapy.’” He added that regulators would be challenged by a model where drugs are not evaluated in isolation. “There may be a lot of promise here... but it’s really easy to forget about issues related to safety, issues related to rigor, issues related to reputational risks.” And then Insel warned against anything that evoked “recreational use” (399). The medicalized approach is receiving a lot of warranted attention, but the landscape of psychedelic therapy is broad and populated by many ardent professionals wanting healthy people to access these mind-states with and without their help. Pollan heartily endorses the guided psychedelic model as offering access to another mode of consciousness to relate to and integrate into one’s ordinary life. “If dreams and fantasies and free associations are worth interpreting, then surely so is the more vivid and detailed material with which the psychedelic journey presents us” (406). Pollan notes that many of the things he learned “were the kinds of things one might learn in the course of psychotherapy: insights into important relationships; the outlines of fears and desires ordinarily kept out of view; repressed memories and emotions; and, perhaps most interesting, and useful, a new perspective on how one’s mind works.” He goes on, “This, I think, is the great value of exploring non-ordinary states of consciousness: the light they reflect back on the ordinary ones, which no longer seem quite so transparent or so ordinary. To realize, as William James concluded, that ‘normal waking consciousness is but one of many potential forms of consciousness – ways of perceiving or constructing the world – separated from it by merely ‘the flimsiest of screens,’ is to

recognize that our account of reality, whether inward or outward, is incomplete at best” (409). As a *New York Times* bestseller, *How to Change Your Mind* is now a part of the broader conversation toward the legitimization of psychic exploration, with its attendant concerns and its aspirations.

Before I conclude this review, I want to offer some final thoughts and a New York Mycological Society anecdote. First, it is worth observing the presence of the entrepreneur moderator on that panel on “The Future of Psychedelic Psychiatry.” Today’s culture is not the culture of the 1960s and even if one cannot patent a mushroom and the LSD patent has expired, there will be people trying to monetize this movement. Given that Big Pharma cannot patent these drugs to subsidize Phase III trials, money will have to come from other deep pockets. To the degree that legalization becomes part of the public conversation, an economics of self interest not particularly considered in this book, will become part of the conversation as well. These are concerns that were voiced at the Horizons, Perspectives on Psychedelics conference I attended in early October of this year. At the conference, I took a photo of one power point image from Monnica Williams, Ph.D., an Associate Professor in the Department of Psychological Sciences at the University of Connecticut who was speaking a bit about her research but mostly teaching a primer of systematic racism. Under the header of “Clinical Musings,” she asked, “Can psychedelics heal our social psychopathology – racism and white supremacy.” Also, “Who will move psychedelic medicine forward?” Michael Pollan has written a magnificent and deep conversation piece on psychedelics with himself standing in as a pleasing everyman – sensible, affable, skeptical and smart. I loved this book and he is clearly not an everyman. Pollan is not concerned

continued on page 13

Green-Wood Cemetery: A Place for the Dead That Teems with Life

By Sigrid Jakob



Amanita onusta



I've always liked cemeteries. Even when I was little I made a point of taking the shortcut through the 'scary' local cemetery on the way to school. And when I travel I'll often skip the guidebook attractions to explore the largest, oldest, most beautiful cemetery a city has to offer, based on the premise that how you honor your dead tells you as much about a culture as do its amusements and attractions.

When I moved five blocks from Green-Wood cemetery eight years ago it wasn't entirely by coincidence. Living close to those verdant, undulating 478 acres pulsing with the City's history was a small dream come true.

In the years since it's become much more than a place for an occasional wander. And it all started with a Facebook post. Gary, on the 19th of December 2015 mused "Our NYMS NYC PARKS checklists over the past 9 years have shown us so many more mushrooms than we ever imagined we had growing in NYC parks - BUT - there is one big exception: the BOLETES. ... Maybe we need a BOLETE PATROL - a group willing to survey these parks

in the summer just for boletes. Anyone interested?"

It was a post that launched a mission. Ethan Crenson took Gary up on his challenge, a badge was designed, a battle cry unveiled (*cives fungi munere functi*), and the Patrol took to the parks. Starting in the summer of 2016, dozens of club members have taken it upon themselves to survey the city's parks for boletes, and our bolete lists have greatly expanded since that momentous post.

The timing couldn't have been better. I had started to come on NYMS walks a few months earlier, but like so many newbies was struggling with 'beginner's overload'—so many new mushrooms, so many new names to learn—names that over the course of a long winter would inevitably be forgotten. I was eager to get better, to one day even become a contributor not just regurgitator of knowledge. But mastering this knowledge felt like a daunting task, and with over 1000 mushrooms in the city alone I wasn't at all sure where to start.

It was at this point that I realized that less is more. Don't try and learn everything at once. Focus on one genus, and work your way up. Start with one small patch of land, not the whole city. Gary himself was perhaps the best example for the latter principle. While he'd traveled the world in search of rare mushrooms it was very clear that his near daily wanderings of Central Park were as great a source of knowledge, insight and inspiration for him: to observe a species over its whole life cycle, in different weather conditions, over many years. To get a sense of its favorite terrain, its mycorrhizal partners, other plants and animals that are part of the same ecosystem.

This is what Green-Wood Cemetery became for me: a microcosm from which to slowly build my knowledge of fungi, one at a time, fed by near-daily walks throughout the year. It had the added attraction of being somewhat under-covered by the club; a place we only occasionally visit, and only in parts. This meant that even as a rank beginner I could break new ground and contribute potentially valuable knowledge about this unique urban ecosystem.

While Green-Wood is home to many different kinds of mushrooms and lichens, it goes all out on boletes—quite unlike Prospect Park, only a few blocks to the north. From the first days of June, when *Xerocomellus chrysen-teron* and *Boletus subvelutipes* shyly peek through the grass, to the end of October when *Gyroporus castaneus* finally call it quits, Green-Wood is a veritable bolete haven. Fourteen different species call it home for sure, and there might well be more. This summer has brought *Suillus americanus* and *Suillus granulatus* for the first time, so who knows what else lies dormant here? Green-Wood is also one of the few

places in the New York area where the rare *Neoboletus pseudosulphureus* can occasionally be found.

There's more, much more. Green-Wood is an arboretum, home to a great variety and number of trees—over 7,000, many over 100 years old. These trees create conditions in which all kinds of *Amanita* (including *A. sub-solitaria*, *A. onusta* and the mysterious *Amidella* section) thrive, and so do many *Russulas*, especially of the foetid kind. Fall gives rise to countless *Grifola frondosa*, lots of *Armillaria*, oysters and wood ears and no other park comes close to Green-Wood's bounty of blewits. Finally, it's also good for the occasional oddball like a *Cystoderma aureum*, a mystery *Cortinarius* or the *Calvatia sculpta* that I found once and have never seen again.

The bounty doesn't stop with fungi. A grove of wild persimmon trees yields sweet fruit up until December. Mulberry, hickory and black walnut trees can be found in several places.. And to the lichen-minded, Green-Wood's diversity of stone makes it a wonderful place to find otherwise uncommon lichens. Ask Nova Patch!

Now, more than two years later, Green-Wood is still a near daily destination for me. My hour in the cemetery before work is my education, but it's also meditation, my exercise and the time when I chew on the problems that I am getting paid to solve. It's a better use of my time than a gym or at the desk. And its quixotic layout and countless dips and peaks have me getting lost even after of hundreds of visits. It's a place that never gets old and never ceases to surprise.

If you haven't been before, do visit. It's one of New York City's best kept secrets—green, clean and peaceful even in the summer when trash and wild toileting make New York's city parks less welcoming to the mycophile.

A couple of things to know.

Rules: I always work from the assumption that, as with so many other parks and cemeteries, fungi may not be removed. Also, Green-Wood will occasionally spray parts of the cemetery with pesticides.

Tools: Green-Wood has a great interactive tree map (<https://www.green-wood.com/trees>). The 500+



Cystoderma aureum (*Phaeolepiota aurea*)

oaks in particular are good places to start looking. But your best guide to the best mushroom areas in the cemetery is [iNaturalist](#) where Nova Patch and I have logged our many findings.

What patch of land will you use to look at the world anew?

all photos © Sigrid Jakob



Suillus americanus



Gyroporus castaneus



Boletus subvelutipes



Suillus granulatus

The Mushroom at the End of the World

On the Possibility of Life in Capitalist Ruins

By Anna Lowenhaupt Tsing

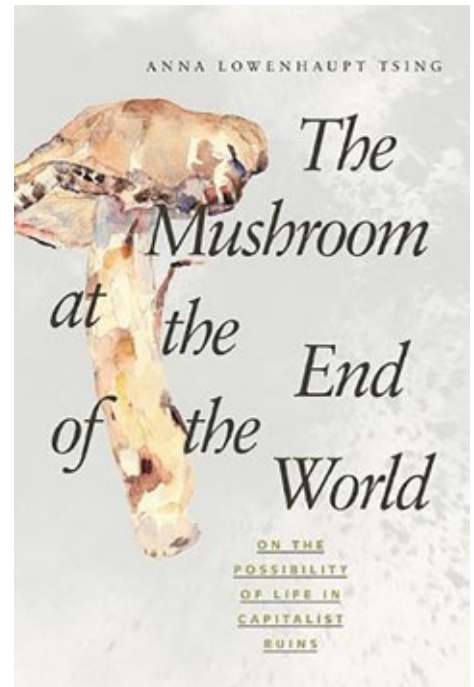
2017 Paperback 352 pp. Princeton 9780691178325 \$19.95

Book Review by William May

Anna Lowenhaupt Tsing's richly rewarding, *The Mushroom at the End of the World*, might benefit from a note of caution before the reader dives in. Its structure, and the introduction, appear to promise a very different book than the one I found myself reading. Tsing speaks of "indeterminacy" and her desire to craft a work that mimics the unexpected ways in which fungi spread and fruit throughout the world. The peculiar illustrations and bits of poetry interspersed throughout and the word "indeterminacy," itself, suggest something more conventionally poetic than what she has given us. If NYMS members' eyes lit up a bit at that word, John Cage does finally make a brief appearance in an "Interlude" titled "Smelling" between the second and third chapter. But this truly is the academic book that the subtitle "On the Possibility of Life in Capitalist Ruins" hints at and is as much about Marxist and feminist theory as it is about its ostensible subject, the matsutake. I was actually tempted to put it down early on when it seemed that the book assumes an easy familiarity with names like J.K. Gibson-Graham, Michael Hardt, and Antonio Negri (fascinating social theorists, it turns out, who I will probably not get around to reading). But what a mistake that would have been! I began to enjoy the book when I started to take the advice she gives right at the outset and approached it as a jumping off point for ideas of my own, reading it in little bursts and hopping around whenever I felt like it.

I recommend this approach—moving past sections that seem a little dense or that you might simply not be interested in and then perhaps looping back to them at a later point. Tsing does have a set of arguments that may be easier to follow if you get through some of the sociological theory and background that can be tough going at the beginning of the book, but, as useful as all of that is, it's not necessary in order to enjoy and benefit from Tsing's curious mind at work on a myriad of other topics. And one of the many joys of the book is experiencing the way that her ideas are constantly looping backward and forward, linking up in unexpected ways; she's more interested in raising questions than in providing definitive answers.

The section titled "Open Ticket, Oregon" is one good place to start. Open Ticket is the name she has given to the cluster of tents along the side of a highway in Oregon that served as the center of the matsutake commerce for at least a stretch of time that Tsing was researching her book. It is also the name given to a peculiar method of buying and selling the mushroom. Since the price can fluctuate wildly throughout an evening, an "open ticket" buyer allows pickers to return to them later in the night and receive the difference between the price they received earlier in the evening and the higher price, if it has later jumped up. It's a difficult concept to grasp fully, and it takes a lot of mental gymnastics to figure out how this would actually work in prac-



tice. The buyers encourage pickers to sell their mushrooms earlier in the evening with this method. The buyers also compete with each other for exclusive relationships with the pickers. It's an economic system that cedes much of the control of the market to the worker (although Tsing and the pickers, themselves, bristle at that word) and is decentralized. This concept probably comes close to summarizing her "argument" such as it is and the chapter is nicely balanced between mushroom lore and social science. But this a book of tangents. And tangents and their value are, in the end, the larger point.

And so Marxist and feminist theory lead us to chapters about the history of forest management in Finland, the

US-Indochina war, and the logging industry in the American west. But the most fascinating sections to me and the ones that would certainly interest most members of the New York Mycological Society are the ones that touch on the science of mushrooms. Best of all for me was the chapter in which she explores the problems involved in classifying species and the pitfalls of the new trends towards relying entirely on DNA. I learned more about the history of taxonomy and the unique challenges fungi pose in one brief section of this book than I have learned anywhere else. Tsing welcomes the new information that DNA sequencing has added to the conversation, but where many people appear to think this information has solved a problem and essentially ended the conversation, she recognizes that it opens up our dialogue further. To oversimplify, in mycology more than 5% divergence in a very specific section of the DNA sequence (the ITS region) indicates a new species. But even if we can all agree on what defines a species genetically, does a species tell the whole story? Anyone who has spent any time foraging knows that environmental factors—

a tree partner being the most obvious of many—can dramatically change the appearance and flavor of what might be one “species.” “Species” does not translate directly to “kind,” and the whole notion of species in the first place depends historically on sexual reproduction. Working within this framework presents endless sets of difficulties when dealing with organisms that reproduce asexually and sexually in a variety of different and surprising ways. The ways that matsutake exchange genes, in particular, make for such a compelling case study, that Tsing “was so excited when [she] understood that [she] spilled [her] tea all over [her] tray.” Her excitement, especially in this chapter, is infectious. And that is hopefully an apt metaphor for this book, which truly deserves a wider audience. Hopefully, I have done my part to spread the germs (or spores) in many different contexts and with so many different people since reading it, and I hope that her “open ticket” approach to scientific inquiry gains traction in academia. It is certainly an approach that mycology, which benefits so much from citizen science already, would do well to learn from.

Pollan continued from page 9

with representation. I was disappointed as I read that most of his interview subjects were professional white men, but I took it for granted that those might be the people who paved this path in North America and Europe. I do think as a mental exercise of reimagining, there is a value in considering whose bodies are imagined or elaborated upon in his book, and what other kinds of bodies with different traumas or subjectivities might someday encounter the psychedelic journey. I was excited to learn that there are efforts to train clinicians of color in guide-work. There were suggestions from other panelists about creating advisory panels consisting of whatever demographic population was intended to be served by a clinical trial. There were suggestions to look back to AIDS activism for its work in democratizing medicine and for models of distribution that weren't wrapped up in the political agendas of the wealthy. Pollan's book is an excellent gateway to the world of guided psychedelics. I am grateful that having shown up to a larger conversation on expansive consciousness, a more expansive conversation is in fact taking place.

And finally, as a small aside, I feel obliged to mention that Gary Lincoff found his way into this book. During the chapter on the history of psilocybin, Pollan and the mycologist Paul Stamets look at archival footage together at Stamets' home in the Pacific Northwest. One highlight worth mentioning is a dusty VHS the two watch of a mushroom conference in the late 70s, where among an assortment of characters, “... the New York Botanical Garden mycologist Gary Lincoff...arrived to great fanfare in a psychedelically painted school bus piloted by Ken Kesey” (102). The description is a passing one, but evokes a delightful image of a man who moved through so many rooms over the course of his life, in pursuit of knowledge.

Name That Mushroom!



Can you guess this winter mushroom? The winner—the first to guess the correct binomial—will receive a Bolete Patrol patch. Send your response to juniperperlis@yahoo.com.

The Mushroom Fan Club by Elise Gravel

2018 Hardcover 56 pp. fully illustrated
Enfant 1770463224 \$17.95
grade level 3-4

Book Review by Mac Crenson



Because you are reading this in the New York Mycological Society newsletter, I am going to assume that you know more than just the basics about mushrooms. I'll also assume that you find mushrooms fascinating, alluring and, when appropriate, delicious. But I'm also going to assume that you're not a kid. *The Mushroom Fan Club* by Elise Gravel is definitely a book for kids. It's written in a fun, breezy style and is full of colorful pictures of mushrooms. In almost every picture the mushrooms have eyes... and mouths ... plus they talk sometimes.

That's not to say that adults won't like *The Mushroom Fan Club*.

This book contains only facts, and was one of the most useful books about mushrooms I have read that I can easily understand. The book describes and illustrates the basic parts of a mushroom, different kinds of

caps and stems, and the many ways in which they grow. It describes edible and poisonous mushrooms including Morels, Chanterelles, and Destroying Angels. Even though it has all this useful information, it doesn't forget to keep mushrooms fun. For instance, showing how puffballs explode when you stomp on them! The book also doesn't forget to mention that identifying mushrooms can be a challenge. (We know this in my house. My Dad identifies tiny specks on sticks for a hobby.) Everyone reading this review could understand this book as easily as distinguishing cheese from watermelon. Which is easy, if you have ever looked at cheese or watermelon. And even though you might already know all the information in this book, you'll definitely enjoy it for its charm and whimsical illustrations. Furthermore, for a child who likes mushrooms, it makes a fantastic gift.

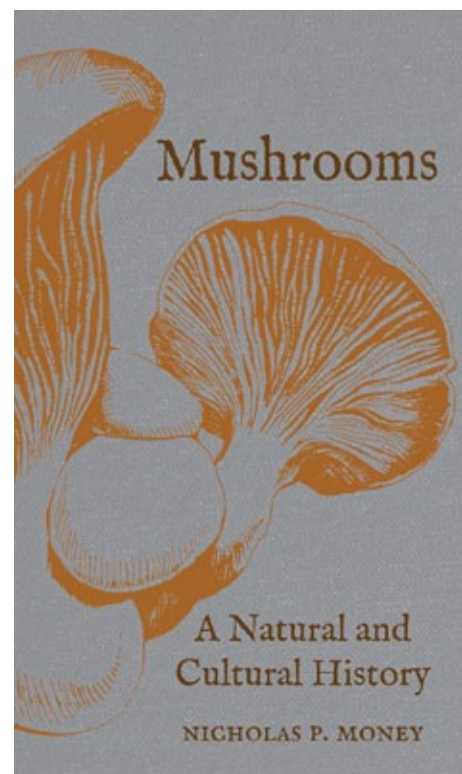
Mushrooms: A Natural and Cultural History by Nicholas P. Money

2017 Hardcover 224 pp.
90 illustrations Reaktion
9781780237435 \$30.00

Book Review by Matt Gardner

While I have read a number of introductory books on the subject, *Mushrooms* has no shortage of mycological history and lesser-known facts about the world of fungi that will keep even seasoned mycology buffs turning page after page. Money positions the subject matter as not merely the topic of a science text, but he gives these organisms a treatment as if they are characters in a playful and humorous biological story. The many relevant

personal experiences and musings of the author bring the reader into the mind of an objective and dedicated lifelong student of fungi. While playful and engaging, he covers some of the more technical aspects of organismal biology and the fungal kingdom's relationship with humans in an accessible yet detailed manner. Additionally, the expertly chosen photographs and illustrations really bring the content to life. As with much mycological literature, the author raises as many important questions, requiring further inquiry, as he answers within these pages. But this is the nature and beauty of science. The future of fungi is bright, and this read will give anyone interested in the field and its history a broad understanding of the many facets of mushrooms along with a hearty helping of humor.



Organic Mushroom Farming and Mycoremediation

By Tradd Cotter

2014 paperback 382 pp.

Chelsea Green 97816035845555

\$39.95

Book Review by Craig Trester

For anyone interested in expanding their mycological skills beyond identification and moving toward application, I highly recommend *Organic Mushroom Farming and Mycoremediation* by Tradd Cotter. While there is a plethora of research on fungi available from journals, in books, and on the internet, few resources frame information within the context of utilizing the regenerative capacity of these organisms. Derived from Cotter's experience working with fungi for over 20 years as a cultivator and citizen scientist, the book is an accessible primer on working with fungi for any seasoned or novice mycophile. The book is organized into four parts highlighting principle aspects of applied mycology: fundamentals of mushroom cultivation, integration of fungi into everyday life, advanced techniques for improved mycological research, and a collection of profiles for several gourmet and medicinal species, even ones that aren't commonly cultivated.

Cotter's introduction highlights the circumstances of an encounter as a young college biology student that began his mycological journey and the founding of Mushroom Mountain, his farm and research site in South Carolina. Still living at home with his parents, his mother recommends that he swing by a local mushroom farm for a tour, since it aligned with his studies. While Cotter acknowledges this was his parents' way of suggesting he get a job, this visit proved to be the spark that kindled a passionate and lifelong career with fungi.

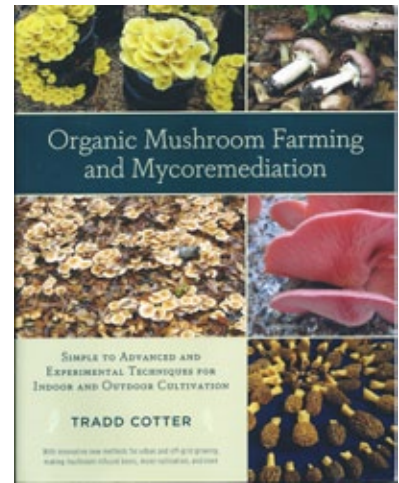
During the farm tour, Cotter was mesmerized in the fruiting room, seeing shelves of shiitake blocks packed full of mushrooms in the humid fog, akin

to something out of a dream. Full of fascination and with a pound of shiitakes in hand, he peppered the farmer with questions until getting into his car. Sitting behind the wheel with mind still abuzz, he began to pull away when the farmer flagged him down to ask if he wanted to work there.

Part One of the book begins with a crash course into the life cycle of fungi, from spore to mycelium to fruit, providing a clear explanation into the science of why and how mushrooms form to propagate the fungal organism. Cotter then provides an elementary overview of the mushroom cultivation process, dividing it into several distinct steps that are full of information and thoughtful details than can help ensure success. This is followed by a description of how to select a species of fungus to cultivate and how to source spawn for inoculation. He provides a guide for creating outdoor cultivation installations and indoor operations.

Part Two outlines the practical applications of fungi outside of the mushroom patch or the fruiting room. Integrating mycelium to recycle common household wastes into potent composts, processing fruiting bodies into food and drink products, along with cultivation strategies for those living in urban areas or off grid scenarios. There is also ample information on the business of promoting oneself as a cultivator of fungi and useful tips to market the mushrooms and products you produce. An entire chapter is dedicated to introducing fungi to students of all ages through effective activities of varying intensity, organized by level of education with detailed and well written lesson plans to match.

Part Three builds upon the first, providing information necessary for developing more complex cultivation skills. This involves formulating agar medium to culture fungal strains from tissue or spore and the construction of a sterile laboratory environment with the proper equipment and



materials to do so. Cotter outlines the overview of how to build this workspace and provides a useful checklist of materials needed for purchase and assembly. This is followed by instructions on how to establish cultures from mycelium or spore, proper storage methods for different strains you've collected, and how to create spawn from a variety of substrates used to bulk up the mycelium. Two chapters highlight these advanced cultivation techniques. The first chapter discusses the use of stimuli (microbial, hormonal, and electrical) to initiate fruiting and boost yields. The second chapter addresses Cotter's own progress cultivating mycorrhizal species, focusing on *Morchella*.

Part Four serves as a brief introduction to mycoremediation, a subset of bioremediation that seeks to use the metabolic secretions which fungi produce to degrade environmental contaminants of organic, inorganic, or microbial origin. This provides a basic explanation and overview of the discipline, while suggesting a few small scale remediation projects and techniques necessary to implement them. This past summer I had the luxury of meeting Leif Olson, one of Cotter's employees from Mushroom Mountain. I learned that this chapter was intended to be longer and richer in detail, but it was curtailed by request of the publisher. This content will be included in a book by Tradd Cotter dedicated to mycoremediation which is currently in the works.



Paul Sadowski
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