

The Fungal Kingdom

Editors: Joseph Heitman, Barbara J. Howlett, Pedro W. Crous, Eva H. Stukenbrock, Timothy Y. James, and Neil A.R. Gow
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I'm frequently asked to recommend mycological books. Field guides to mushrooms of a particular geographic region, naturally. But I'm also asked about textbooks, by those wanting to learn about fungi beyond memorization of basidiomycete fruitbodies (and whether you can eat them). This review will drop a few names of favorite titles, but will mostly discuss the massive new compendium of mycology which recently arrived on my doorstep with a thud.

My first mycological text of any sort was *The Audubon Society Field Guide to North American Mushrooms* by Gary Lincoff. I was given this book when I was a kid and used it nearly incessantly. I have no idea where that copy is; I've since gone through several additional

copies. As a college student, I immersed myself in *Introductory Mycology* by Alexopoulos and Mims (more recently Meredith Blackwell has become a third author), and Agrios's *Plant Pathology*. For a mycology student there were not really many choices. By the time I became a university professor, the choices had increased somewhat; I continued to use the previous titles but added Bryce Kendrick's wonderful *The Fifth Kingdom* to my students' required reading. Still, pretty much all mycological texts required a college-level understanding of the subject, and thus off-putting to the majority of mycophiles. Just in the past decade a number of new mycological titles have been added so that nowadays there is something for everyone from rote beginner, advanced "amateur" mycologist or citizen scientist, to academic employing molecular tools for research. My favorite book for beginners (or anyone really) wanting to learn interesting snippets about all groups of fungi (and with fantastic photographs), with concise, approachable language is *The Kingdom of Fungi* by Jens Petersen (2012, Princeton University Press). This book has it all and is really affordable. For more advanced mycophiles or those wanting a great desk reference for pretty much all mycological topics, my favorite has become *Introduction to Fungi* by Webster and Weber (2009, Cambridge University Press). This book is laid out much like Alexopoulos and Mims, but with much added information (and comes in at 800 pages).

When it arrived, I had assumed that the massive, thousand-page *The Fungal Kingdom* published by ASM Press was to be the be-all, end-all of mycology texts. It is ... and it isn't. Indeed, I'm not sure who the audience is for this book.

This is definitely not a book for beginners. This book is not small. This book is comprehensive, up to date, and an academic mycological reference book for the Molecular Era. Fungal research and knowledge has grown rapidly following recent advances in genetics and genomics. This book synthesizes new

knowledge with existing information to stimulate new scientific questions and propel fungal scientists on to the next stages of research and covers all topics pertaining to fungi: environmental sensing, genetics, genomics, interactions with microbes, plants, insects, and humans, technological applications, and natural product development. And it should be pointed out that the reading can be a bit dry, though each of the 54 chapters is amply supported with excellent color illustrations. And there are plenty of references cited at the end of each chapter. But each chapter reads like a scientific review paper in a journal and I'm not sure anyone other than someone specialized in the field might be interested.

The chapters are arranged in the following nine sections: Part I. Fungal Branches On The Eukaryotic Tree Of Life: Chap. 1, The Fungal Tree of Life: From Molecular Systematics to Genome-Scale Phylogenies; Chap. 2, Six Key Traits of Fungi: Their Evolutionary Origins and Genetic Bases; Chap. 3, What Defines the "Kingdom" Fungi?; Chap. 4, Fungal Diversity Revisited: 2.2 to 3.8 Million Species; Chap. 5, Microsporidia: Obligate Intracellular Pathogens Within the Fungal Kingdom.

Part II. Life Of Fungi: Chap. 6, Fungal Sex: The Ascomycota; Chap. 7, Fungal Sex: The Basidiomycota; Chap. 8, Fungal Sex: The Mucoromycota; Chap. 9, Sex and the Imperfect Fungi; Chap. 10, Molecular Mechanisms Regulating Cell Fusion and Heterokaryon Formation in Filamentous Fungi; Chap. 11, Cell Biology of Hyphal Growth; Chap. 12, The Fungal Cell Wall: Structure, Biosynthesis, and Function; Chap. 13, Fungal Ecology: Principles and Mechanisms of Colonization and Competition by Saprotrophic Fungi; Chap. 14, Long-Distance Dispersal of Fungi; Chap. 15, The Mycelium as a Network.

Part III. Fungal Ecology: Chap. 16, The Geomycology of Elemental Cycling and Transformations in the Environment; Chap. 17, Ecology of Fungal Plant Pathogens; Chap. 18, Key Ecological Roles for Zoosporic True Fungi in Aquatic Habitats.

Part IV. How Fungi Sense Their Environment: Chap. 19, Nutrient Sensing at the Plasma Membrane of Fungal Cells; Chap. 20, The Complexity of Fungal Vision; Chap. 21, Stress Adaptation;

Chap. 22, Thigmo Responses: The Fungal Sense of Touch; Chap. 23, Melanin, Radiation, and Energy Transduction in Fungi; Chap. 24, Making Time: Conservation of Biological Clocks from Fungi to Animals; Chap. 25, Target of Rapamycin (TOR) Regulates Growth in Response to Nutritional Signals.

Part V. Fungal Genetics And Genomics As Models For Biology: Chap. 26, Fungal Cell Cycle: A Unicellular versus Multicellular Comparison; Chap. 27, A Matter of Scale and Dimensions: Chromatin of Chromosome Landmarks in the Fungi; Chap. 28, Ploidy Variation in Fungi: Polyploidy, Aneuploidy, and Genome Evolution; Chap. 29, Fungal Genomes and Insights into the Evolution of the Kingdom; Chap. 30, Sources of Fungal Genetic Variation and Associating It with Phenotypic Diversity; Chap. 31, RNA Interference in Fungi: Retention and Loss; Chap. 32, Amyloid Prions in Fungi; Chap. 33, Repeat-Induced Point Mutation and Other Genome Defense Mechanisms in Fungi.

Part VI. Fungal Interactions With Plants: Impact On Agriculture And The Biosphere: Chap. 34, Plant Pathogenic Fungi; Chap. 35, The Mutualistic Interaction between Plants and Arbuscular Mycorrhizal Fungi; Chap. 36, Lichenized Fungi and the Evolution of Symbiotic Organization; Chap. 37, Fungal Plant Pathogenesis Mediated by Effectors; Chap. 38, Emerging Fungal Threats to Plants and Animals Challenge Agriculture and Ecosystem Resilience.

Part VII. Fungi And The Human Host: Chap. 39, Fungi that Infect Humans; Chap. 40, The Mycobiome: Impact on Health and Disease States; Chap. 41, Skin Fungi from Colonization to Infection; Chap. 42, Fungal Biofilms: Inside Out; Chap. 43, Fungal Recognition and Host Defense Mechanisms; Chap. 44, Antifungal Drugs: The Current Armamentarium and Development of New Agents.

Part VIII. Fungal Interactions With Animals (Fungi, Insects, And Nematodes) And Other Microbes: Chap. 45, The Insect Pathogens; Chap. 46, Made for Each Other: Ascomycete Yeasts and Insects; Chap. 47, Nematode-Trapping Fungi; Chap. 48, Host-Microsporidia Interactions in *Caenorhabditis elegans*, a Model Nematode Host; Chap. 49, Bacterial Endosymbionts: Master Modulators of Fungal Phenotypes; Chap.

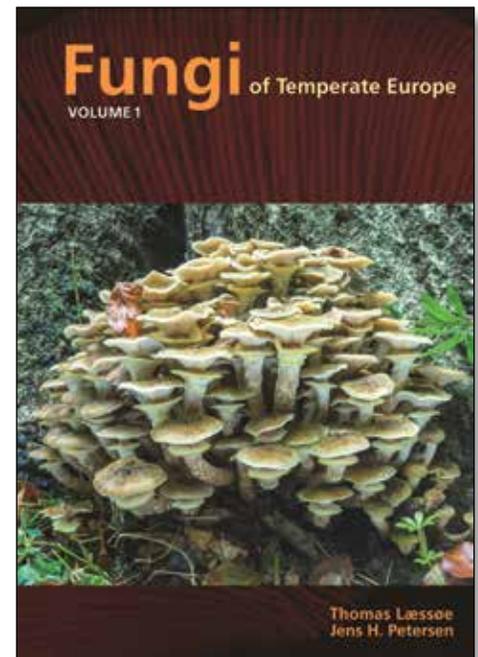
50, Necrotrophic Mycoparasites and Their Genomes.

Part IX. Fungi: Technology And Natural Products: Chap. 51, Fungal Enzymes and Yeasts for Conversion of Plant Biomass to Bioenergy and High-Value Products; Chap. 52, Fungal Ligninolytic Enzymes and Their Applications; Chap. 53, Fungi as a Source of Food; Chap. 54, Biologically Active Secondary Metabolites from the Fungi.

The authors should be commended for the monumental work amount of work that went into producing this book, the result of four years and many dozens of contributors. They explain that the time was right for such a book in the Preface: "Given the rapidly advancing fields of fungal genetics and genomics, and mycology more generally, we increasingly found ourselves in need of a compendium to organize this information and to serve as a reference to guide both our own efforts and those of others whose research focuses on or interfaces with fungi. We have assembled a team of six editors with complementary and diverse interests and enlisted a cadre of 170 experts in the field who as authors have contributed the 54 chapters that comprise *The Fungal Kingdom*. We have organized the book into nine different sections to present related material together and provide a framework for organization. Each chapter is designed to be self-contained, such that any reader may choose to read any given chapter in isolation or a series of related chapters from one section. At the same time, the book has a coherent theme of focusing on the diversity, importance, impact, dangers, and beauty of the fungi and could therefore be read as a continuous text. As modes of publication have advanced, this book is also an experiment in that it is available as a hard copy printed volume, as an electronic book, and as individual chapters available electronically or in their published form as part of the *Microbiology Spectrum* journal from ASM Press."

The Fungal Kingdom is an amazing body of work. But as stated, I'm not sure who the audience is, the price is not cheap (though when you think of the amount of paper involved, it's probably a pretty good value), and I'm not sure how well it will sell.

-Britt A. Bunyard



Fungi of Temperate Europe

Thomas Læssøe and Jens Petersen

2019, Princeton University Press

ISBN-10: 0691180377

ISBN-13: 978-0691180373

Product Dimensions: 8 x 3.5 x 11.5 inches

Shipping Weight: 11.9 pounds

Hardback; 2 volumes; 1,708 pages;

7,000 color illus.

\$110

Readers of FUNGI will probably be familiar with Danish mycologist Jens Petersen, whose book *The Kingdom of Fungi* offers a remarkable window on the Kingdom to which all of us are so devoted. Another well-known Danish mycologist, Thomas Læssøe, is a senior researcher at the Natural History Museum of Denmark and author of numerous books on fungi. Joining their proverbial hands, these two individuals spent five years putting together a two volume guidebook entitled *Fungi of Temperate Europe* (Danish title: *Nordeuropas Svampe*). With such accomplished mycologists, you would expect these volumes to be good, but they're not merely good—they're (sorry, but I can't curb my enthusiasm) utterly sensational, ranking with *Fungi of Switzerland* as perhaps the best fungal guidebooks on this or any other planet.

Volume 1 contains 45 pages of front matter, with sections on fungal biogeography, asexual propagation, taste

and smell, and microscopy, among other topics. These sections are eminently readable even if the reader happens to be an amateur or citizen-scientist, so-called. The rest of the volume focuses on the identification of agarics. Volume 2 covers the identification of polypores, corticioids, jellies, ascomycetes, and stinkhorns, among other fungi. The total number of species covered in both volumes is, believe it or not, 2,800. Likewise, the two volumes contain 7,000 color illustrations, with close-ups of the diagnostic features included when necessary. Their combined weight makes them not the sort of guidebook(s) you would take into the field ... except possibly for bench-pressing.

Apart from its poundage, *Fungi of Temperate Europe* is not your typical guidebook. For one thing, it hardly focuses at all on edibility or toxicity. For another, it considers numerous species seldom covered in other guidebooks. Thus it contains 18 *Typhula* species, 12 *Arrhenia* species, 8 *Hohenbuehelia*, and 28(!) pages on *Inocybes*. But what makes it a truly innovative guidebook is the keys. The authors eschew dichotomous keys in favor of what they call “wheel keys” or “fungus wheels.” These are pie charts where the identifier starts in the middle and works his or her way outwards via photographs. Species are connected more or less morphologically. An example: non-deliquescing *Coprinellus* species are placed on the same wheel as *Psathyrellas*. Another example: cyphelloids are placed on the same wheel as inoperculate cup fungi. While the perpetual splitting of names (genus envy?) by phylogeneticists won't assist you in identifying the specimen you might be looking at, the fungus wheels are designed to do so.

Not surprisingly, Petersen and Læssøe are responsible for the multi-access digital identification key known as MycoKey (www.mycokkey.com), which they created to empower fungal identification in a non-phylogenetic manner—i.e., without making base pairs the be-all and end-all of the identification process. In fact, *Fungi of Temperate Europe* can be considered an attempt to transport what they've discovered from MycoKey into book form.

Since morphology matters to these Danish mycologists, you won't be surprised to learn that virtually every

one of the 7,000 photos is extremely sharp. As previously indicated, many of those photos offer close-ups of important diagnostic features; every one of them also has a scale bar so that you can immediately determine the size of the species in question. With respect to the abbreviated text, it includes the up-to-date binomial of each species, its physical characters, habitat, distribution, spore size, lookalikes, and whether it's common or rare. Speaking of rarity, the text also includes a subject altogether alien to North American mycology—conservation status.

I know what you're thinking: can I use *Fungi of Temperate Europe* for identifying North American specimens? The answer is yes, because there's a considerable overlap between species in Europe and North America. In browsing the two volumes, you might scratch your head when you gaze at many of the species. Some species that cause this head scratching may indeed be native only to Europe. Many others can be found in North America, but they're seldom included in North American guidebooks ... especially if those guidebooks focus only on species that are blatantly charismatic or blatantly edible. Here are a few examples of such seldom-included species: *Gloiodon strigosus*, *Exidiopsis effusa*, and Laboulbeniales (Harvard mycologist Roland Thaxter's specialty). Unusual for any guidebook, there's also an entire section on rusts and smuts.

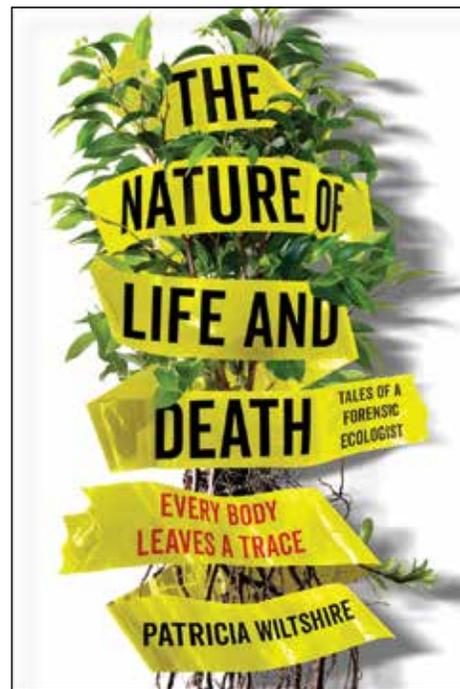
Let me conclude this review by indicating a “first” in the history of mycological guide-books—*Fungi of Temperate Europe* contains a key for LBMs! So what are you waiting for? Both volumes are essential for any mycological library, so you should procure them at your earliest convenience.

—Lawrence Millman

The Nature of Life and Death: Every Body Leaves a Trace

Patricia Wiltshire

2019; Putnam Publ., an imprint of Random House
Hardcover; 304 pages; 6 x 9 inches
ISBN-10: 0525542213
ISBN-13: 978-0525542216
\$27 at penguinrandomhouse.com



I've long been a sucker for that crime fiction stereotype, the old lady sleuth who defies social expectations by being clever and fearless. The nosy Miss Marple, the curious Jessica Fletcher, the cozy Miss Maud Silver, they all have in common independence (often the result of being man-less), a kind of post-menopausal unflappability, and an infinite capacity to upend the assumptions of condescending cops and criminals. So it was with great delight that I met the real thing in the pages of Patricia Wiltshire's fascinating memoir *The Nature of Life and Death*.

Dr. Wiltshire, also known as the queen of forensic science, also known as the snot lady for her unique retrieval of microscopic evidence from the nasal cavities of the dead, is a petite, fastidious 77-year-old, a lover of cats, baroque music, and sloe gin who is arguably the UK's premier forensic ecologist/botanist/palynologist. (Palynology is, literally, the “study of dust,” or microscopic organic particulates.) In other words, she collects and analyzes the pollen granules and fungal spores that are carried out of, or into, crime scenes on killer's shoes, clothes, shovels, and gas pedals, and helps police figure out the how, what, and where's of a crime. “We all leave our marks on the environment,” she writes, “but the environment leaves its marks on us too.”

Her technique, once the samples are collected and identified in a process she

describes as “mind-blowingly tedious,” is to recreate in her mind the vegetation at the crime scene—forest or meadow, backyard or farm—and from that extrapolate the nature of the soil, the shade, the sun. She can determine the maturity of trees in a site cops are looking for based on pollen findings—spruce, for example, don’t produce pollen until they are forty—and with the help of criminal behavior profiles, like the fact that murderers won’t carry a corpse much more than 100 meters, and British flora distribution maps, she can conceptualize the terrain where a body might be found or where a killer had been. Because each square meter of landscape, she notes, is unique, like a fingerprint.

Dr. Wiltshire is quite good at this recreation—it has aided detectives in almost 300 cases, from cracking the Jigsaw murder where she helped connect dismembered and widely distributed body parts to a killer couple, to nailing Chinese Triad assassins, even catching a team of illegal badger cullers by soil traces left on their lethal spades. Painting a picture based on myriad details is what she does, and she has done it again in this lively profile of her work and personality.

The Nature of Life and Death (“Traces” in the English publication) is a hybrid book. In most chapters a bit of well-described biology 101 (microbiology, mycology, botany, plant defense systems, the specifics of human decomposition, and so on) leads to a thrilling true crime story (strangulations, rapes, stabbings, poisonings), and how she helped solve it in her own fastidious way. Quick descriptions of crime related-stuff like the history of fingerprints, DNA analysis, and the backstory of Locard’s exchange principle 18 which says a perp will always bring something into the crime scene and take something out, are peppered throughout.

A significant percentage of the book is personal history evoking her sickly childhood in a Welsh coal mining village where she recuperated in the company of her encyclopedias, her love of science and subsequent academic and professional achievements, the traumatic death of her young daughter, and her unintentional career in forensics. A portrait of a prickly, precise, and plucky woman emerges, one who can remove a corpse’s face skin as tidily as she

maintains her immaculate kitchen; who readily scolds cops that are skeptical of her methods (“after all these years of teaching them,” she sniffs “they still cannot seem to get their heads around the constraints and requirements of environmental sampling”), and lawyers that challenge her findings in court by suggesting ‘dandelions are found everywhere aren’t they?’ *Well, of course they are not*” she writes. This lady in pearls anticipates a trip to the Body Farm in Knoxville, Tennessee where the rate of human decay is studied with the excitement of “a child who wakes early on Christmas morning.” Really, what’s not to love?

Well, there is some redundancy in *The Nature of Life and Death*. Dr. Wiltshire is prone to describe how she solved a case from fact A to conclusion Z, and then tells the story over again, from Z to A. Likewise, she tends to repeat phrases from one chapter to the next, and I found myself wondering if I had lost my place or she just thought I needed reminding. And the final chapter, a summary of what she has learned from her life, feels like an assignment from her editor, though it is quite interesting: she reviews highlights, like meeting the queen, and chides foolishness, like the commercialization of the Forensic Science Service which provides CSI-like aid to police. Her atheism, rooted in her scientific literacy, is marvelously described; it’s like a lyrical slap.

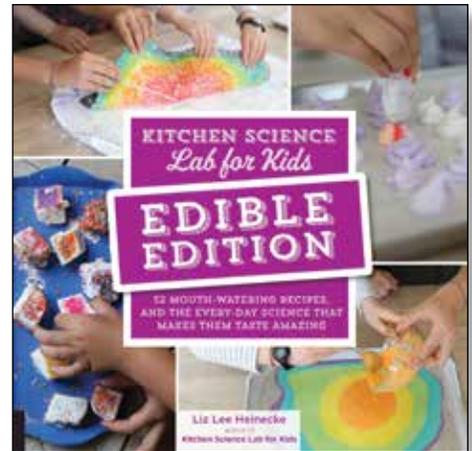
“How wonderful,” she writes, “to be reincarnated as a bluebell, an oak tree and a lovely beetle all at the same time.” And then the kicker: “It will certainly happen whether you like the idea or not.”

Crabby, brilliant, and brittle, but also quite tender when it comes to grieving families Dr. Wiltshire seems straight out of central casting for a British detective series. She’s an eccentric who, after proving guilt in an Albanian gang murder, goes home, puts on her sweat pants, makes herself a dinner of beans and toast, and cuddles with her cat. With a lead character like this, the science and crimes, while highly readable, are mainly stages and props for this engaging and enlightening one woman show.

-Eugenia Bone

The reviewer is the author of Mycophilia: Revelations from the Weird World of Mushrooms, and more recently Microbia: A Journey into the Unseen

World Around You. *This review first appeared in The Wall Street Journal.*



Kitchen Science Lab for Kids, Edible Edition: 52 Mouth-watering Recipes and the Everyday Science That Makes Them Taste Amazing

Liz Lee Heinecke
2019, Quarry Books
ISBN-10: 1631597418
ISBN-13 : 9781631597411
Flexibound, 144 pages
Product Dimensions:
8.6 x 0.6 x 8.6 inches
\$22.99

Now THIS is a fun book! If you enjoy sharing the joys of science with kids—or have little ones who love to help out in the kitchen—this book is for you. This book was easily the most used cookbook by our family in the weeks following its arrival. The publishers list the age range at 8 –12 years and grade level at 3–7, which is about right, though I have kids older who are the biggest fans. Even though you might enjoy cooking and take it very seriously, you may never consider that when you cook or bake, you’re putting science to work. Physics and chemistry come into play each time you simmer, steam, bake, freeze, boil, puree, saute, or ferment food. Knowing something about the physics, biology, and chemistry of food will give you the basic tools to be the best chef you can be—no matter your age. *Kitchen Science*

gathering of wild mushrooms. And it should be pointed out that this 2019 printing of *Musings* is a second edition with six additional stories from the first printing (2010).

Musings is not the typical book with a story line from beginning to end. Nevertheless, most of its twenty eight rather short chapters focusing on individuals, places, happenings, and opinions that impacted Denis' sensitivity share a *leitmotif*: the sustained and unfinished quest for the "ever larger mother lode." With his usual wry wit, keen insight, and the recount of some outrageous moments, Denis *amuses* the reader from cover to cover. Since the narrative is not linear, the reader can choose to read Chapter 25 before chapter 5 or 11, etc., since each is basically an independent essay.

Perhaps, I should not be the "critic" of *Musings*, since Denis has acknowledged me, and even included me briefly in it. However, and even though I had previous knowledge of many of the events, I can attest to the allure of the prose and the situations with one example. A passage in chapter 9 held me at end of my seat and feeling goose pimples as I vicariously drove up the Cascade Mountains on an ice-covered highway waiting for the moment in which the vehicle would skid off and crash at the bottom of the slope, even though I know that Denis and his buddy are alive and well. I think it is not because the suspense of many of the events, but that they resonate with our own experiences during our own quest.

Chapter 20 reflects on the somewhat antagonistic feelings of camaraderie and competition in the search for elusive finds, in this case, morels. It is the aspiration to be the first, the luckiest, and the acceptance that it is reasonable even when upstaging a friend. "It is all right," Denis declares candidly, "we are human males." (Perhaps a bit politically incorrect statement in this new age, but an undisputable description of a collective trait of the species.)

Other critics may point to minor shortcomings, such as incidental misspelling of mushroom species, or similarities with other events told by someone before. But those pesky comments will not detract from appreciating the enthusiasm of the author, the exhilaration of the search, and

the charm of the characters and situations depicted. It is personal, yet documentary of an avocation and also educative.

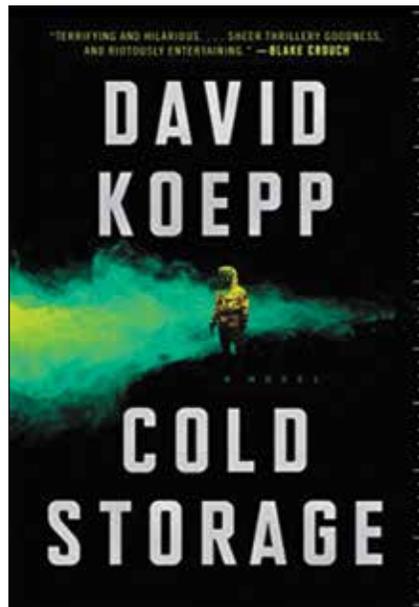
Musings should be appreciated by mycologists and naturalists of all ages because it includes something for everyone. To the seasoned ones, it will stir reminiscences of past hunts; to the active ones, the renewed interest in an unparallel pursuit; and to the budding amateurs, the lure to the thrill of a major discovery.

Musings is certainly a perfect companion to sit in front of a glowing fire, glass in hand, during the winter interlude as we anticipate our own future reenactments of similar circumstances. It will be equally satisfying when relaxing during balmy weather.

-Albert J. Casciero

Mycofiction – Best Picks!

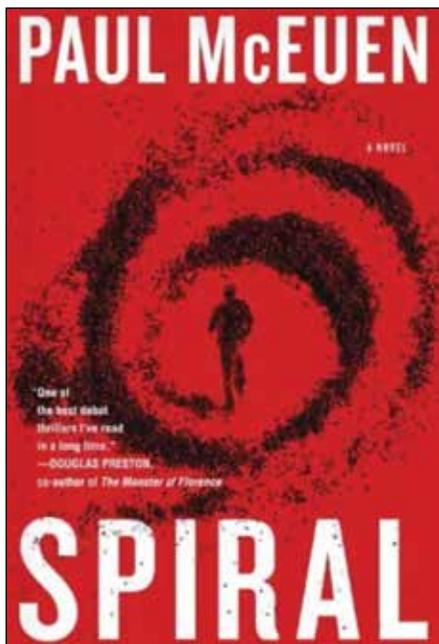
Our books department handles numerous reviews, throughout the year; mostly the latest in field guides, desk references, and the occasional biography. Fiction? Not so much. But we definitely get asked. A lot. With the winter reading season upon us—and a brand new best seller hot off the press—it's a good time to offer an incomplete list of our Best Picks. MAY CONTAIN SPOILERS.



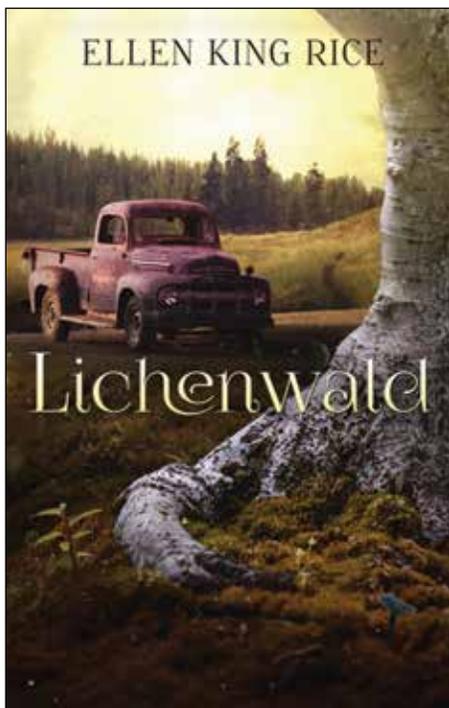
A brand new arrival: ***Cold Storage* by David Koepp** (2019, Ecco, ISBN: 0062916432, 304 pages). Synopsis: When Pentagon bioterror operative Roberto Diaz was sent to investigate a suspected biochemical attack, he found something far worse: a

highly mutative form of the *Cordyceps* fungus capable of extinction-level destruction. He contained it and buried it in cold storage deep beneath a little-used military repository. Now, after decades of festering in a forgotten mine in the middle of Kansas, the specimen has found its way out and is on a lethal feeding frenzy. Only Diaz knows how to stop it. He races across the country to help two unwitting security guards—one an ex-con, the other a single mother. Over one harrowing night, the unlikely trio must figure out how to quarantine this horror again. All they have is luck, fearlessness, and a mordant sense of humor. Will that be enough to save all of humanity? This book was a fun and very quick read. No, the biology is not plausible. But so what, that's why science fiction is fun! And if the book reads like a ready-to-go script for the next big Hollywood thriller, it's because the author is one of the most successful screenwriters of all-time (*Jurassic Park*, *Panic Room*, *Spider Man*, *Mission: Impossible*, etc.). Next stop: the Big Screen.

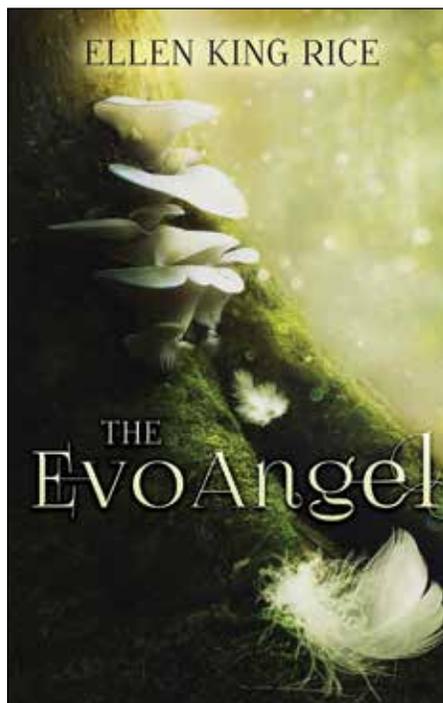
"There have been a slew of microbiological thrillers written over the years. Invariably, you can spot the plotline a mile away: some sort of a deadly, highly infectious microbe is spreading out of control. Will the world be spared? Will a cure be found in time to save humanity? Most thrillers of this genre are too unrealistic to really strike a nerve (or much fear) and fizzle with a predictable ending. Indeed, only *The Andromeda Strain* and *The Hot Zone* ever scared me enough to keep my attention. Until now. Award-winning Cornell University physicist Paul McEuen has woven a fascinating and fast-paced thriller that I was quite literally unable to put down. Which leads me to the author's only 'flaw': the book is only 300 pages and I really wished it were more like 800!" This is how a review in FUNGI began for ***Spiral* by Paul McEuen** (2011, The Dial Press, ISBN-10: 038534211X; ISBN-13: 9780385342117, 312 pages). *Spiral* is an excellent book. Synopsis: McEuen weaves together fictional history (at least, I *hope* it's fictional), world socio-economic politics, medical mycology, and all sorts of other cool sciencey stuff. And nano robots. Oh, and all sorts of not-so-distantly futuristic high tech gizmos. The story



is fast-paced, ebbing between Cornell University, New York City, and the US Department of Agriculture’s invasive plant pathogen facility at Ft. Detrick, just outside of Washington, DC. Fort Detrick is the home to the US military’s former biological warfare research program. Do I have your attention, now?

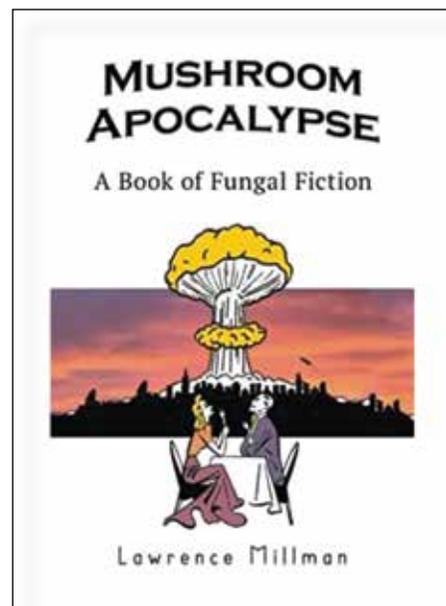


Ellen King Rice has a brand new book out, *Lichenwald*, the third in her series of “mushroom thrillers.” As this issue went to press, we do not yet have a review, but you can find an ad with information elsewhere in this issue. However, we can highly recommend



The EvoAngel (2016, Undergrowth Publ., ISBN: 9780996979603, 454 pages) which is where the series began a few years ago. “...a page-turner, but not relentlessly—action alternates with more bucolic moments of nature, myco-rumination, and lots of well-explained science about mycology and epigenetics—in fact, author Rice is a former wildlife biologist, and she’s careful to get her facts straight. If you’re new to mycology, this book actually comprises a good basic description of what a fungus is and how it operates in the world, and there’s also plenty of information I didn’t know about genetics. The plotting and characters reminded me of one of my favorite authors, Carl Hiaasen—realistically quirky people from a wide variety of ethnicities, cultures and classes, insider knowledge about the ways of academia and professional biology, and a big dollop of the kind of zaniness that happens in real life more often than you’d think,” wrote Maria Reidelbach in her review in FUNGI, a few years back. Synopsis: Edna Anderson is known throughout the Pacific Northwest as a leading expert on mycology, the go-to resource for mushroom poisonings of both man and beast. She’s part of a long line of wise women, including her beyond beautiful daughter Lena and precocious granddaughter Piper. But more than that, she and her kin have a biological condition that must be kept

secret. A mushroom extract that is used to rid cattle of parasites might be the miracle cure for Edna’s family. But are her doctors acting benevolently or do they have more nefarious plans? And along the way, an agent at the National Security Administration who monitors North Korean experiments to weaponize fungi, gets wind of what’s going on and our story spirals out of control.

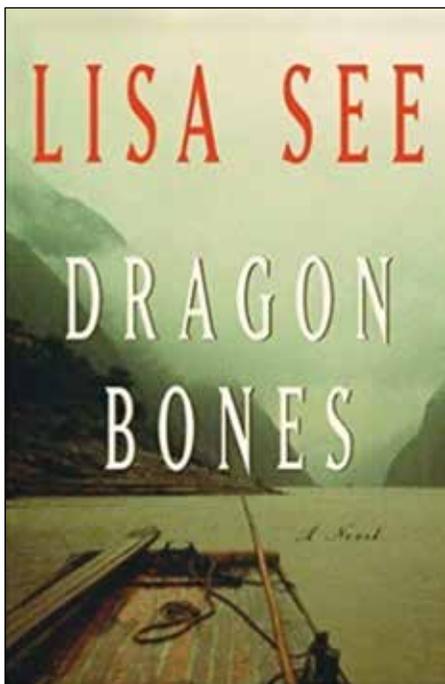


Lawrence Millman’s *Mushroom Apocalypse* (2017, CreateSpace Independent Publishing ISBN-10: 1542723302, ISBN-13: 9781542723305, 76 pages) is his 16th book, but first collection of fungal fiction. Some of the short stories first appeared in FUNGI. And many will have a familiar ring or characters: Jean Valjean, Papa Hemingway, Faust, Pushkin, Sherlock Holmes ... no one is safe from the far-reaching hyphae of Millman. Picture the Dalai Lama as magic mushroom aficionado, Sherlock Holmes as an expert mushroom identifier, a Russian czar named Ivan who’s a terrible mushroom identifier, and a mycologist named Rowland Faust who makes a deal with the devil, and finally revealed: the real reason behind Ivan the Terrible’s nickname.

Another anthology of short mycofiction is *FUNGI*, edited by **Orrin Grey and Silvia Moreno-Garcia** (2012, Innsmouth Free Press, ISBN: 9780991675913, 344 pages). Innsmouth is a tiny Canadian publisher that specializes in science fiction, horror, and the like. This collection does indeed

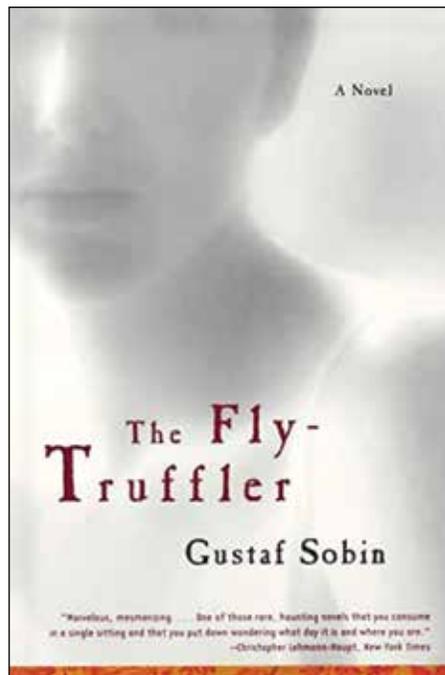


feature many sci-fi themes, plus some that are downright creepy. My favorite, however, “Tubby McMungus, Fat from Fungus,” is much more whimsical.



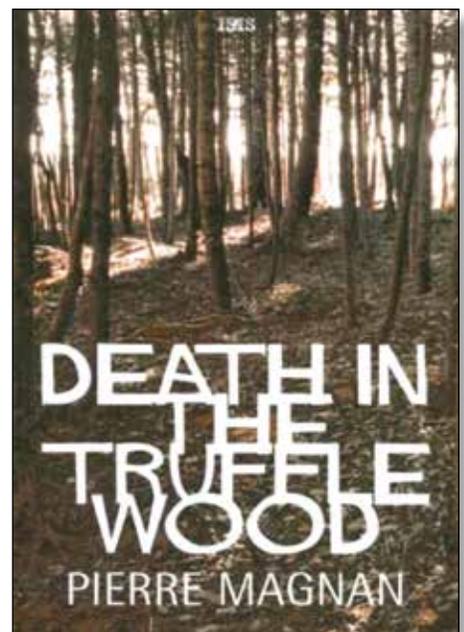
If you like your fiction to involve some plot twists (some of them a bit gruesome), check out *Dragon Bones* by Lisa See (2003, Random House, ISBN: 0679463208, 343 pages). Synopsis: China, during construction of the massive the Three Gorges Dam and a corpse is found. The murder victim turns out to be that of an American archeologist working to recover ancient

artifacts from the caves which will be submerged upon completion of the dam project. A bit of investigation determines that the religious artifacts were created from *lingzhi* mushrooms ... mushrooms used for health and longevity. A mycologist wants to study them. But sinister characters have other plans—and will stop at nothing to get those mushrooms of immortality.



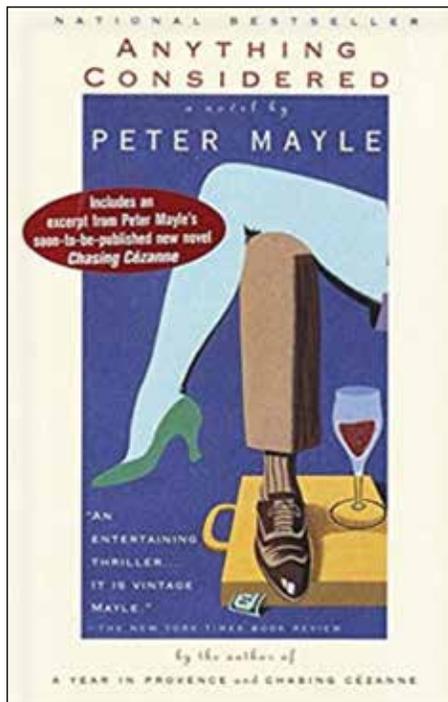
Fans of truffles should check out these three titles. *The Fly-Truffler* by Gustaf Sobin (1999, Norton, ISBN: 0393048322, 155 pages) is a beautifully written little novella by the acclaimed author and poet Gustaf Sobin. Synopsis: Our hero is a certain Philippe Cabassac, a French linguistics professor whose pet subject is the dying Provençal dialect. Devoting one’s life to the study of a fading language can be tough emotionally and financially, I’m guessing. He lives in a dilapidated farmhouse—the family home for eight generations—selling off a parcel of land each year in order to make ends meet. Every sale is a kind of small betrayal, for Cabassac’s roots in the Provençal landscape run deep. To fill his larder (and to rejuvenate his mind) he stalks the estate’s property for natural delicacies, “truffling every winter, gathering wild asparagus in the spring, flowering medicinal herbs each summer, and a plethora of pale, speckled mushrooms each fall.” He is most devoted to the art of truffling and not unlike the Old World truffle gatherers that use pigs or dogs, he

watches for the fungus flies “*lei mousco*,” drawn by the rich scent of truffles, and that lay their eggs in the loose topsoil nearby. Since the death of his young wife, Julieta, the truffles have come to represent something far more than a delicacy for Cabassac’s palate: these black truffles have a strange additional power, one that gives his hunt a special urgency: eating them brings on dreams of his recently deceased wife. Desperate to prolong his nighttime contact with Julieta, he soon neglects teaching, his estate, and indeed all the obligations of his waking life—except for hunting the keys to the underworld where his wife dwells. The book is so richly written that you can almost smell the damp earth as Cabassac’s fingers probe—desperately, somnambulistically—for one more of those hypogeous sporocarps.



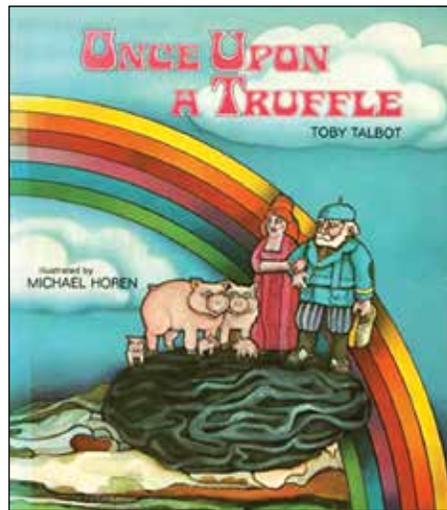
In contrast, a mystery unfolds in *Death in the Truffle Wood* by Pierre Magnan (2007, St. Martin’s Press, ISBN: 0312366663, 201 pages). Synopsis: The inhabitants of a small village in Provence cultivate and harvest truffles, their main source of income. All the characters in this novel are crazy about truffles. And the author goes into beautiful detail as to how the villagers savor their mycological treasures. Some store them for a couple of days with eggs so that the truffles infuse their perfume into the eggs, some eat them right out of the basket, grit and all, the truffle juice running down their chins. Wouldn’t you know it: one of the townsfolk starts killing villagers for their blood to enhance the production

of truffle trees. As villagers disappear, Commissaire Laviolette, a favorite French fictional detective, is called in. Had he paid immediate attention to Roseline, the truffle pig and heroine of this very French charming novel, he could have solved the case right away.



And if you cannot get enough truffles, served with a side order of murder, check out *Anything Considered* by Peter Mayle (1997, Vintage Books, ISBN: 0679441239, 303 pages). Mayle is the author of other very popular books including *A Year in Provence*, *A Dog's Life*, and *Hotel Pastis*. Synopsis: An extremely wealthy money and truffle lover in France pays a research chemist to develop a formula for inoculating oak trees that will produce lots of truffles ... *within two years!* The finished formula and all research data are enclosed in a custom-made custom-locked case. The secret leaks out, the chemist is murdered, the case is stolen by a competitor who plans to sell to the highest bidder. Whodunnit? I'll not say everyone is suspect including the French Government—wanting to hold on to the franchise for Perigord truffles, the Italians—who want to put the French truffle competitors out of business, the Japanese—who love both truffles and money, and others (just imagine the millions YOU could make from this discovery!

Mycofiction for kids? Sure! Over the years there have been many titles.

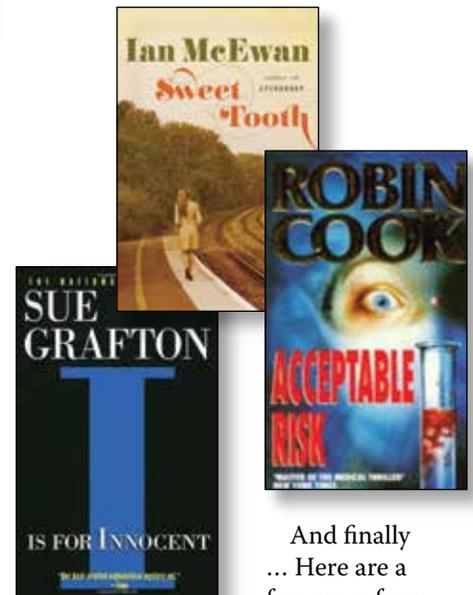


Once Upon a Truffle by Toby Talbot (1970, Cowles, ISBN 0402140044, 47 pages) comes to mind. But the best one of late has to be one of the *A Series of Unfortunate Events* by Lemony Snicket



(the pen name of Daniel Handler) series. These books are aimed at young adult readers but suitable for adults to read to little ones—or to themselves. The wildly popular series of books have been turned into a feature film, and a wonderful tv series by Netflix—that's even better than the books—starring Neil Patrick Harris, Patrick Warburton, and many other stars. But it's Book 11, *The Grim Grotto* (2004, Harper Collins, ISBN: 0064410145, 352 pages) that features a fungus. The heroes of the series of stories are three precocious children (Klaus, Violet, and Sunny) who lost their parents in a tragic fire and were forced to go live with a dastardly Count Olaf. It seems that all of the ensuing stories have to do with Count Olaf and the Baudelaire siblings in a race to secure the family fortune. All along the way,

the children face near doom and, well, unfortunate events that keeps the reader enthralled. Synopsis: Our heroes wind up in the deep, dark recesses of a dank cave where they are terrorized by a strange creature. Another child hero of the story who, it turns out, is an aspiring mycologist, ascertains the dangerous foe is fungal in nature. And she knows just what to do! Using her knowledge of fungi—and a mycophilic library that seems to be ever at her fingertips—our young hero saves the poor Baudelaire. Were I to have such a collection of mycological texts!



And finally ... Here are a few more from way way back

in the mycofiction collection. All are written by hugely famous international best selling authors. *"I" is for Innocent* by Sue Grafton (1992, Henry Holt, ISBN: 0805010858, 224 pages). Yes! One of Sue Grafton's "alphabet series" of mysteries involved a mushroom. Synopsis: Mysterious death or murder? Fairy rings and *Amanita phalloides* seen growing nearby. A connection? (Note: Ms. Grafton died in 2017, her final book in the series was Y.) *Acceptable Risk* by Robin Cook (1994, Putnam, ISBN: 0399139710, 404 pages). Synopsis: Salem Witch Trials, ergot fungus and their hallucinogenic compounds are known to mycologists and historians ... but can their dangerous metabolites be harnessed to create designer drugs by evil-genius scientists? *Sweet Tooth* by Ian McEwan (2012, Anchor, ISBN: 9780385536820, 301). Synopsis: Cold War spies in England share a love of secrets, literature ... and wild mushrooms.