

The Mushroom at the End of the World

*On the Possibility of Life in
Capitalist Ruins*

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Enabling Entanglements

EVER SINCE THE ENLIGHTENMENT, WESTERN PHILOSOPHERS have shown us a Nature that is grand and universal but also passive and mechanical. Nature was a backdrop and resource for the moral intentionality of Man, which could tame and master Nature. It was left to fabulists, including non-Western and non-civilizational storytellers, to remind us of the lively activities of all beings, human and not human.

Several things have happened to undermine this division of labor. First, all that taming and mastering has made such a mess that it is unclear whether life on earth can continue. Second, interspecies entanglements that once seemed the stuff of fables are now materials for serious discussion among biologists and ecologists, who show how life requires the interplay of many kinds of beings. Humans cannot survive by stomping on all the others. Third, women and men from around the world have clamored to be included in the status once given to Man. Our riotous presence undermines the moral intentionality of Man's Christian masculinity, which separated Man from Nature.

The time has come for new ways of telling true stories beyond civilizational first principles. Without Man and Nature, all creatures can come back to life, and men and women can express themselves without the strictures of a parochially imagined rationality. No longer relegated to whispers in the

night, such stories might be simultaneously true and fabulous. How else can we account for the fact that anything is alive in the mess we have made?

Following a mushroom, this book offers such true stories. Unlike most scholarly books, what follows is a riot of short chapters. I wanted them to be like the flushes of mushrooms that come up after a rain: an over-the-top bounty; a temptation to explore; an always too many. The chapters build an open-ended assemblage, not a logical machine; they gesture to the so-much-more out there. They tangle with and interrupt each other—mimicking the patchiness of the world I am trying to describe. Adding another thread, the photographs tell a story alongside the text but do not illustrate it directly. I use images to present the spirit of my argument rather than the scenes I discuss.

Imagine “first nature” to mean ecological relations (including humans) and “second nature” to refer to capitalist transformations of the environment. This usage—not the same as more popular versions—derives from William Cronon’s *Nature’s Metropolis*.¹ My book then offers “third nature,” that is, what manages to live despite capitalism. To even notice third nature, we must evade assumptions that the future is that singular direction ahead. Like virtual particles in a quantum field, multiple futures pop in and out of possibility; third nature emerges within such temporal polyphony. Yet progress stories have blinded us. To know the world without them, this book sketches open-ended assemblages of entangled ways of life, as these coalesce in coordination across many kinds of temporal rhythms. My experiment in form and my argument follow each other.

The book is based on fieldwork conducted during matsutake seasons between 2004 and 2011 in the United States, Japan, Canada, China, and Finland—as well as interviews with scientists, foresters, and matsutake traders there as well as in Denmark, Sweden, and Turkey. Perhaps my own matsutake trail is not yet over: matsutake in places as far afield as Morocco, Korea, and Bhutan beckon. My hope is that readers will experience some of this “mushroom fever” with me in the chapters to come.



Below the forest floor, fungal bodies extend themselves in nets and skeins, binding roots and mineral soils, long before producing mushrooms. All books emerge from similarly hidden collaborations. A list of

individuals is inadequate, and so I begin with the collaborative engagements that made this book possible. In contrast to most recent ethnography, the research on which this book is based was pursued in experiments in collaboration. Furthermore, the questions that seemed to me worth pursuing emerged from knots of intense discussion in which I have been only one among many participants.

This book emerged from the work of the Matsutake Worlds Research Group: Timothy Choy, Lieba Faier, Elaine Gan, Michael Hathaway, Miyako Inoue, Shiho Satsuka, and myself. In much of the history of anthropology, ethnography has been a solo performance; our group convened to explore a new anthropology of always-in-process collaboration. The point of ethnography is to learn how to think about a situation together with one's informants; research categories develop *with* the research, not before it. How can one use this method when working with other researchers—each learning from different local knowledge? Rather than knowing the object in advance, as in big science, our group was determined to let our research goals emerge through collaboration. We took up this challenge by trying a variety of forms of research, analysis, and writing.

This book opens a Matsutake Worlds mini-series; Michael Hathaway and Shiho Satsuka will present the next volumes. Consider it an adventure story in which the plot unfolds from one book to the next. Our curiosity about matsutake worlds cannot be contained in one volume or expressed by one voice; stand by to find out what happens next. Furthermore, our books join other genres, including essays and articles.² Through the work of the team, plus filmmaker Sara Dosa, Elaine Gan and I designed a web space for stories of pickers, scientists, traders, and forest managers across several continents: www.matsutakeworlds.org. Elaine Gan's art-and-science practice has inspired further collaborations.³ Sara Dosa's film *The Last Season* adds to these conversations.⁴

Matsutake research takes one not only beyond disciplinary knowledge but also to places where varied languages, histories, ecologies, and cultural traditions shape worlds. Faier, Inoue, and Satsuka are scholars of Japan, and Choy and Hathaway of China. I was to be the group's Southeast Asianist, working with pickers from Laos and Cambodia in the U.S. Pacific Northwest. It turned out, however, that I needed help. Collaboration with Hjorleifur Jonsson and the assistance of Lue Vang and David Pheng were essential to my research with Southeast Asians

in the United States.⁵ Eric Jones, Kathryn Lynch, and Rebecca McLain of the Institute for Culture and Ecology got me started in the mushroom world and remained amazing colleagues. Meeting Beverly Brown was inspirational. Amy Peterson introduced me to the Japanese-American matsutake community and showed me the ropes. Sue Hilton looked at pines with me. In Yunnan, Luo Wen-hong became a team member. In Kyoto, Noboru Ishikawa was an extraordinary guide and colleague. In Finland, Eira-Maija Savonen arranged everything. Each trip made me aware of the importance of these collaborations.

There are many other kinds of collaborations that go into producing a book. This one draws particularly on two intellectual developments, both local and broad. I had the privilege of learning feminist science studies at the University of California, Santa Cruz, in part from teaching with Donna Haraway. Here I glimpsed how scholarship could cross between natural science and cultural studies not just through critique but also through world-building knowledge. Multispecies storytelling was one of our products. The feminist science studies community in Santa Cruz has continued to make my work possible. Through it, too, I met many later companions. Andrew Mathews kindly reintroduced me to forests. Heather Swanson helped me think through comparison, and Japan. Kirsten Rudestam talked to me about Oregon. I learned from conversations with Jeremy Campbell, Zachary Caple, Roseann Cohen, Rosa Ficek, Colin Hoag, Katy Overstreet, Bettina Stoetzer, and many more.

Meanwhile, the strength of critical feminist studies of capitalism in Santa Cruz and beyond inspired my interest in knowing capitalism beyond its heroic reifications. If I have continued to engage with Marxist categories, despite their sometimes-clunky relation to thick description, it is because of the insights of feminist colleagues, including Lisa Rofel and Sylvia Yanagisako. UC Santa Cruz's Institute for Advanced Feminist Research stimulated my first attempts to describe global supply chains structurally, as translation machines, as did study groups at the University of Toronto (where I was invited by Tania Li) and at the University of Minnesota (where I was invited by Karen Ho). I feel privileged to have had a short moment of encouragement from Julie Graham before her death. The "economic diversity" perspective that she pioneered with Kathryn Gibson helped not just me but many scholars. On questions of power and difference, Santa Cruz conversations with James

Clifford, Rosa Ficek, Susan Harding, Gail Hershatter, Megan Moodie, Bregje van Eekelen, and many more were essential.

A number of grants and institutional arrangements made my work possible. A seed grant from the University of California Pacific Rim Research Program helped sponsor the first stages of my research. A Toyota Foundation award sponsored Matsutake Worlds Research Group joint research in China and Japan. UC Santa Cruz allowed me to take leaves to continue my research. Nils Bubandt and Aarhus University made it possible for me to begin the conceptualization and writing of this book in a calm and stimulating environment. A fellowship from the John Simon Guggenheim Memorial Foundation in 2010–11 made writing possible. The final work on the book overlapped with the beginning of the Aarhus University Research on the Anthropocene project, funded by the Danish National Research Foundation. I am grateful for these opportunities.

Individuals have stepped forward, too, to read drafts, discuss problems, and otherwise make the book possible. Nathalia Brichet, Zachary Caple, Alan Christy, Paula Ebron, Susan Friedman, Elaine Gan, Scott Gilbert, Donna Haraway, Susan Harding, Frida Hastrup, Michael Hathaway, Gail Hershatter, Gregg Hetherington, Rusten Hogness, Andrew Mathews, James Scott, Heather Swanson, and Susan Wright kindly listened, read, and commented. Miyako Inoue retranslated the poetry. Kathy Chetkovich was an essential writing-and-thinking guide.

This book includes photographs only because of Elaine Gan's generous help in working with them. All emerge from my research, but I have taken the liberty of using several photographs shot by my research assistant, Lue Vang, when we worked together (images preceding chapters 9, 10, 14, and bottom photo of the "Tracking" interlude). I took the others. Elaine Gan made them usable with help from Laura Wright. Elaine Gan also drew the illustrations that mark sections within the chapters. They show fungal spores, rain, mycorrhiza, and mushrooms. I leave it to readers to wander through them.



I owe another enormous set of debts to the many people who agreed to talk and work with me in all my research sites. Pickers interrupted their foraging; scientists interrupted their research; entrepreneurs took time

from their businesses. I am grateful. Yet, to protect people's privacy, most individual names in the book are pseudonyms. The exceptions are public figures, including scientists as well as those who offer their views in public spaces. For such spokespersons, it seemed disrespectful to cover up names. A similar intention shapes my use of place names: I name cities but, because this book is not primarily a village study, I avoid local place names when I move to the countryside, where mentioning names might disrupt people's privacy.

Because this book relies on such motley sources, I have included references in notes rather than compile a unified bibliography. For Chinese, Japanese, and Hmong names in the citations, I put the first letter of the family name in bold for the first usage. This allows me to vary surname order, depending on where the author's name happened to enter my research.

A few of the chapters in this book are extended in other forums. Several repeat enough to deserve mention: Chapter 3 is a summary of a longer article I published in *Common Knowledge* 18, no. 3 (2012): 505–524. Chapter 6 is excerpted from “Free in the forest,” in *Rhetorics of insecurity*, ed. Zeynep Gambetti and Marcial Godoy-Anativia (New York: New York University Press, 2013), 20–39. Chapter 9 is developed in a longer essay in *Hau* 3, no. 1 (2013): 21–43. Chapter 16 includes material from an article in *Economic Botany* 62, no. 3 (2008): 244–256; although it is only one part of the chapter, this is notable because the journal article was written with Shiho Satsuka. The third interlude exists in a longer version in *Philosophy, Activism, Nature* 10 (2013): 6–14.

**The Mushroom
at the End of
the World**



たけまの 山 雲霞の
ふくらむ 秋の 芳気
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Prologue Autumn Aroma

Takamato ridge, crowded with expanding caps,
filling up, thriving—
the wonder of autumn aroma.

—*From the eighth-century Japanese poetry collection*
Man-nyo Shu

WHAT DO YOU DO WHEN YOUR WORLD STARTS TO FALL apart? I go for a walk, and if I'm really lucky, I find mushrooms. Mushrooms pull me back into my senses, not just—like flowers—through their riotous colors and smells but because they pop up unexpectedly, reminding me of the good fortune of just happening to be there. Then I know that there are still pleasures amidst the terrors of indeterminacy.

Terrors, of course, there are, and not just for me. The world's climate is going haywire, and industrial progress has proved much more deadly to life on earth than anyone imagined a century ago. The economy is

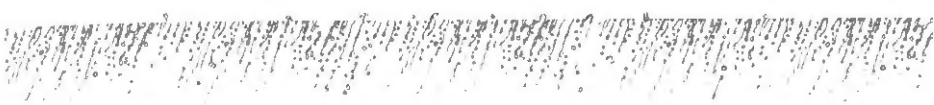
no longer a source of growth or optimism; any of our jobs could disappear with the next economic crisis. And it's not just that I might fear a spurt of new disasters: I find myself without the handrails of stories that tell where everyone is going and, also, why. Precarity once seemed the fate of the less fortunate. Now it seems that all our lives are precarious—even when, for the moment, our pockets are lined. In contrast to the mid-twentieth century, when poets and philosophers of the global north felt caged by too much stability, now many of us, north and south, confront the condition of trouble without end.

This book tells of my travels with mushrooms to explore indeterminacy and the conditions of precarity, that is, life without the promise of stability. I've read that when the Soviet Union collapsed in 1991, thousands of Siberians, suddenly deprived of state guarantees, ran to the woods to collect mushrooms.¹ These are not the mushrooms I follow, but they make my point: the uncontrolled lives of mushrooms are a gift—and a guide—when the controlled world we thought we had fails.

While I can't offer you mushrooms, I hope you will follow me to savor the "autumn aroma" praised in the poem that begins my prologue. This is the smell of matsutake, a group of aromatic wild mushrooms much valued in Japan. Matsutake is loved as a marker of the autumn season. The smell evokes sadness in the loss of summer's easy riches, but it also calls up the sharp intensity and heightened sensibilities of autumn. Such sensibilities will be needed for the end of global progress's easy summer: the autumn aroma leads me into common life without guarantees. This book is not a critique of the dreams of modernization and progress that offered a vision of stability in the twentieth century; many analysts before me have dissected those dreams. Instead, I address the imaginative challenge of living without those handrails, which once made us think we knew, collectively, where we were going. If we open ourselves to their fungal attractions, matsutake can catapult us into the curiosity that seems to me the first requirement of collaborative survival in precarious times.

Here's how a radical pamphlet put the challenge:

The spectre that many try not to see is a simple realisation—the world will not be "saved." . . . If we don't believe in a global revolutionary future, we must live (as we in fact always had to) in the present.²



When Hiroshima was destroyed by an atomic bomb in 1945, it is said, the first living thing to emerge from the blasted landscape was a matsutake mushroom.³

Grasping the atom was the culmination of human dreams of controlling nature. It was also the beginning of those dreams' undoing. The bomb at Hiroshima changed things. Suddenly, we became aware that humans could destroy the livability of the planet—whether intentionally or otherwise. This awareness only increased as we learned about pollution, mass extinction, and climate change. One half of current precarity is the fate of the earth: what kinds of human disturbances can we live with? Despite talk of sustainability, how much chance do we have for passing a habitable environment to our multispecies descendants?

Hiroshima's bomb also opened the door to the other half of today's precarity: the surprising contradictions of postwar development. After the war, the promises of modernization, backed by American bombs, seemed bright. Everyone was to benefit. The direction of the future was well known; but is it now? On the one hand, no place in the world is untouched by that global political economy built from the postwar development apparatus. On the other, even as the promises of development still beckon, we seem to have lost the means. Modernization was supposed to fill the world—both communist and capitalist—with jobs, and not just any jobs but “standard employment” with stable wages and benefits. Such jobs are now quite rare; most people depend on much more irregular livelihoods. The irony of our times, then, is that everyone depends on capitalism but almost no one has what we used to call a “regular job.”

To live with precarity requires more than railing at those who put us here (although that seems useful too, and I'm not against it). We might look around to notice this strange new world, and we might stretch our imaginations to grasp its contours. This is where mushrooms help. Matsutake's willingness to emerge in blasted landscapes allows us to explore the ruin that has become our collective home.

Matsutake are wild mushrooms that live in human-disturbed forests. Like rats, raccoons, and cockroaches, they are willing to put up with

some of the environmental messes humans have made. Yet they are not pests; they are valuable gourmet treats—at least in Japan, where high prices sometimes make matsutake the most valuable mushroom on earth. Through their ability to nurture trees, matsutake help forests grow in daunting places. To follow matsutake guides us to possibilities of coexistence within environmental disturbance. This is not an excuse for further damage. Still, matsutake show one kind of collaborative survival.

Matsutake also illuminate the cracks in the global political economy. For the past thirty years, matsutake have become a global commodity, foraged in forests across the northern hemisphere and shipped fresh to Japan. Many matsutake foragers are displaced and disenfranchised cultural minorities. In the U.S. Pacific Northwest, for example, most commercial matsutake foragers are refugees from Laos and Cambodia. Because of high prices, matsutake make a substantial contribution to livelihood wherever they are picked, and even encourage cultural revitalizations.

Matsutake commerce, however, hardly leads to twentieth-century development dreams. Most of the mushroom foragers I spoke with have terrible stories to tell of displacement and loss. Commercial foraging is a better than usual way of getting by for those with no other way to make a living. But what kind of economy is this anyway? Mushroom foragers work for themselves; no companies hire them. There are no wages and no benefits; pickers merely sell the mushrooms they find. Some years there are no mushrooms, and pickers are left with their expenses. Commercial wild-mushroom picking is an exemplification of precarious livelihood, without security.

This book takes up the story of precarious livelihoods and precarious environments through tracking matsutake commerce and ecology. In each case, I find myself surrounded by patchiness, that is, a mosaic of open-ended assemblages of entangled ways of life, with each further opening into a mosaic of temporal rhythms and spatial arcs. I argue that only an appreciation of current precarity as an earthwide condition allows us to notice this—the situation of our world. As long as authoritative analysis requires assumptions of growth, experts don't see the heterogeneity of space and time, even where it is obvious to ordinary participants and observers. Yet theories of heterogeneity are still in their

infancy. To appreciate the patchy unpredictability associated with our current condition, we need to reopen our imaginations. The point of this book is to help that process along—with mushrooms.

About commerce: Contemporary commerce works within the constraints and possibilities of capitalism. Yet, following in the footsteps of Marx, twentieth-century students of capitalism internalized progress to see only one powerful current at a time, ignoring the rest. This book shows how it is possible to study capitalism without this crippling assumption—by combining close attention to the world, in all its precarity, with questions about how wealth is amassed. How might capitalism look without assuming progress? It might look patchy: *the concentration of wealth is possible because value produced in unplanned patches is appropriated for capital.*

About ecology: For humanists, assumptions of progressive human mastery have encouraged a view of nature as a romantic space of anti-modernity.⁴ Yet for twentieth-century scientists, progress also unself-consciously framed the study of landscapes. Assumptions about expansion slipped into the formulation of population biology. New developments in ecology make it possible to think quite differently by introducing cross-species interactions and disturbance histories. In this time of diminished expectations, I look for *disturbance-based ecologies in which many species sometimes live together without either harmony or conquest.*

While I refuse to reduce either economy or ecology to the other, there is one connection between economy and environment that seems important to introduce up front: the history of the human concentration of wealth through making both humans and nonhumans into resources for investment. This history has inspired investors to imbue both people and things with alienation, that is, the ability to stand alone, as if the entanglements of living did not matter.⁵ Through alienation, people and things become mobile assets; they can be removed from their life worlds in distance-defying transport to be exchanged with other assets from other life worlds, elsewhere.⁶ This is quite different from merely using others as part of a life world—for example, in eating and being eaten. In that case, multispecies living spaces remain in place. Alienation obviates living-space entanglement. The dream of alienation inspires landscape modification in which only one stand-alone asset matters;

everything else becomes weeds or waste. Here, attending to living-space entanglements seems inefficient, and perhaps archaic. When its singular asset can no longer be produced, a place can be abandoned. The timber has been cut; the oil has run out; the plantation soil no longer supports crops. The search for assets resumes elsewhere. Thus, simplification for alienation produces ruins, spaces of abandonment for asset production.

Global landscapes today are strewn with this kind of ruin. Still, these places can be lively despite announcements of their death; abandoned asset fields sometimes yield new multispecies and multicultural life. In a global state of precarity, we don't have choices other than looking for life in this ruin.

Our first step is to bring back curiosity. Unencumbered by the simplifications of progress narratives, the knots and pulses of patchiness are there to explore. Matsutake are a place to begin: However much I learn, they take me by surprise.



This is not a book about Japan, but the reader needs to know something about matsutake in Japan to proceed.⁷ Matsutake first appears in Japan's written record in the eighth-century poem that starts this prologue. Already then, the mushroom is praised for its aromatic marking of the autumn season. The mushroom became common around Nara and Kyoto, where people had deforested the mountains for wood to build temples and to fuel iron forges. Indeed, human disturbance allowed *Tricholoma matsutake* to emerge in Japan. This is because its most common host is red pine (*Pinus densiflora*), which germinates in the sunlight and mineral soils left by human deforestation. When forests in Japan are allowed to grow back, without human disturbance, broadleaf trees shade out pines, preventing their further germination.

As red pine spread with deforestation across Japan, matsutake became a valued gift, presented beautifully in a box of ferns. Aristocrats were honored by it. By the Edo period (1603–1868), well-to-do commoners, such as urban merchants, also enjoyed matsutake. The mushroom joined the celebration of the four seasons as a marker of autumn. Outings to pick matsutake in the fall were an equivalent of cherry-blossom

viewing parties in the spring. Matsutake became a popular subject for poetry.

The sound of a temple bell is heard in the cedar forest at dusk,
The autumn aroma drifts on the roads below.

—AKEMI TACHIBANA (1812–1868)⁸

As in other Japanese nature poetry, seasonal referents helped build a mood. Matsutake joined older signs of the fall season, such as the sound of deer crying or the harvest moon. The coming bareness of winter touched autumn with an incipient loneliness, at the edge of nostalgia, and the poem above offers that mood. Matsutake was an elite pleasure, a sign of the privilege to live within the artful reconstruction of nature for refined tastes.⁹ For this reason, when peasants preparing for elite outings sometimes “planted” matsutake (i.e., stuck mushrooms artfully in the ground because naturally occurring matsutake were not available), no one objected. Matsutake had become an element of an ideal seasonality, appreciated not only in poetry but also in all the arts, from tea ceremony to theater.

The moving cloud fades away, and I smell the aroma of the
mushroom.

—KOI NAGATA (1900–1997)¹⁰

The Edo period was ended by the Meiji Restoration—and Japan’s rapid modernization. Deforestation proceeded apace, privileging pine and matsutake. In the Kyoto area, *matsutake* became a generic term for “mushroom.” In the early twentieth century, matsutake were particularly common. In the mid-1950s, however, the situation began to change. Peasant woodlands were cut down for timber plantations, paved for suburban development, or abandoned by peasants moving to the city. Fossil fuel replaced firewood and charcoal; farmers no longer used the remaining woodlands, which grew up in dense thickets of broadleaf trees. Hill-sides that had once been covered by matsutake were now too shady for pine ecologies. Shade-stressed pines were killed by an invasive nematode. By the mid-1970s, matsutake had become rare across Japan.

This was the time, however, of Japan's rapid economic development, and matsutake were in demand as exquisitely expensive gifts, perks, and bribes. The price of matsutake skyrocketed. The knowledge that matsutake grew in other parts of the world suddenly became relevant. Japanese travelers and residents abroad began to send matsutake to Japan; as importers emerged to funnel the international matsutake trade, non-Japanese pickers rushed in. At first it seemed that there were a plethora of colors and kinds that might appropriately be considered matsutake—because they had the smell. Scientific names proliferated as matsutake in forests across the northern hemisphere suddenly rose from neglect. In the past twenty years, names have been consolidated. All across Eurasia, most matsutake are now *Tricholoma matsutake*.¹¹ In North America, *T. matsutake* seems to be found only in the east, and in the mountains of Mexico. In western North America, the local matsutake is considered another species, *T. magnivelare*.¹² Some scientists, however, think the generic term “matsutake” is the best way to identify these aromatic mushrooms, since the dynamics of speciation are still unclear.¹³ I follow that practice except where I am discussing questions of classification.

Japanese have figured out ways of ranking matsutake from different parts of the world, and ranks are reflected in prices. My eyes were first opened to such rankings when one Japanese importer explained: “Matsutake are like people. American mushrooms are white because the people are white. Chinese mushrooms are black, because the people are black. Japanese people and mushrooms are nicely in between.” Not everyone has the same rankings, but this stark example can stand in for the many forms of classification and valuation that structure the global trade.

Meanwhile, people in Japan worry about the loss of the peasant woodlands that have been the source of so much seasonal beauty, from spring blossoms to bright autumn leaves. Starting in the 1970s, volunteer groups mobilized to restore these woodlands. Wanting their work to matter beyond passive aesthetics, the groups looked for ways restored woodlands might benefit human livelihood. The high price of matsutake made it an ideal product of woodland restoration.

And so I return to precarity and living in our messes. But living seems to have gotten more crowded, not only with Japanese aesthetics and eco-

logical histories, but also with international relations and capitalist trading practices. This is the stuff for stories in the book that follows. For the moment, it seems important to appreciate the mushroom.

Oh, matsutake:

The excitement before finding them.

—YAMAGUCHI SODO (1642–1716)¹⁴



... and you, come,
... my Alexander,
... my gentle,

Part I **What's Left?**

IT WAS A STILL-BRIGHT EVENING WHEN I REALIZED I was lost and empty-handed in an unknown forest. I was on my first search for matsutake—and matsutake pickers—in Oregon's Cascade Mountains. Earlier that afternoon, I had found the Forest Service's "big camp" for mushroom pickers, but all the pickers were out foraging. I had decided to look for mushrooms myself while I waited for their return.

I couldn't have imagined a more unpromising-looking forest. The ground was dry and rocky, and nothing grew except thin sticks of lodgepole pine. There were hardly any plants growing near the ground, not even grass, and when I touched the soil, sharp pumice shards cut my fingers. As the afternoon wore on, I found one or two "copper tops," dingy mushrooms with a splash of orange and a mealy smell.¹ Nothing else. Worse yet, I was disoriented. Every way I turned, the forest looked the same. I had no idea which direction to go to find my car. Thinking I would be out there just briefly, I had brought nothing, and I knew I would soon be thirsty, hungry—and cold.

I stumbled around and eventually found a dirt road. But which way should I go? The sun was getting lower as I trudged along. I had walked less than a mile when a pickup truck drew up. A bright-faced young

man and a wizened old man were inside, and they offered me a ride. The young man introduced himself as Kao. Like his uncle, he said, he was a Mien from the hills of Laos who had come to the United States from a refugee camp in Thailand in the 1980s. They were neighbors in Sacramento, California, and here to pick mushrooms together. They brought me to their camp. The young man went to get water, driving his plastic jugs to a water storage container some ways away. The older man did not know English, but it turned out he knew a little Mandarin Chinese, as did I. As we awkwardly exchanged phrases, he pulled out a smoking hong handcrafted from PVC pipe and lit up his tobacco.

It was dusk when Kao came back with the water. But he beckoned me to go picking with him: There were mushrooms nearby. In the gathering dark, we scrambled up a rocky hillside not far from his camp. I saw nothing but dirt and some scrawny pine trees. But here was Kao with his bucket and stick, poking deep into clearly empty ground and pulling up a fat button. How could this be possible? There had been nothing there—and then there it was.

Kao handed me the mushroom. That's when I first experienced the smell. It's not an easy smell. It's not like a flower or a mouth-watering food. It's disturbing. Many people never learn to love it. It's hard to describe. Some people liken it to rotting things and some to clear beauty—the autumn aroma. At my first whiff, I was just . . . astonished.

My surprise was not just for the smell. What were Mien tribesmen, Japanese gourmet mushrooms, and I doing in a ruined Oregon industrial forest? I had lived in the United States for a long time without ever hearing about any of these things. The Mien camp pulled me back to my earlier fieldwork in Southeast Asia; the mushroom tickled my interest in Japanese aesthetics and cuisine. The broken forest, in contrast, seemed like a science fiction nightmare. To my faulty common sense, we all seemed miraculously out of time and out of place—like something that might jump out of a fairy tale. I was startled and intrigued; I couldn't stop exploring. This book is my attempt to pull you into the maze I found.

水、空氣、水、土を大切に

老

(松川源流地)

マダガスカル
(マダガスカル) 試験地

庚生



記念附

上野の雑草 針葉樹と落葉樹の雑草 2003

人と自然が輝く森づくり
市北
林業振興課

*Conjuring time.
Kyoto Prefecture.
Mr. Imoto's map of
revitalizing. This is his
matsutake mountain:
a time machine of
multiple seasons,
histories, and hopes.*

1 Arts of Noticing

I am not proposing a return to the Stone Age. My intent is not reactionary, nor even conservative, but simply subversive. It seems that the utopian imagination is trapped, like capitalism and industrialism and the human population, in a one-way future consisting only of growth. All I'm trying to do is figure out how to put a pig on the tracks.

—Ursula K. Le Guin

IN 1908 AND 1909 TWO RAILROAD ENTREPRENEURS raced each other to build track along Oregon's Deschutes River.¹ The goal of each was to be the first to create an industrial connection between the towering ponderosas of the eastern Cascades and the stacked lumberyards of Portland. In 1910, the thrill of competition yielded to an agreement for joint service. Pine logs poured out of the region, bound for distant markets. Lumber mills brought new settlers; towns sprung

up as millworkers multiplied. By the 1930s, Oregon had become the nation's largest producer of timber.

This is a story we know. It is the story of pioneers, progress, and the transformation of "empty" spaces into industrial resource fields.

In 1989, a plastic spotted owl was hung in effigy on an Oregon logging truck.² Environmentalists had shown that unsustainable logging was destroying Pacific Northwest forests. "The spotted owl was like the canary in the coal mine," explained one advocate. "It was . . . symbolic of an ecosystem on the verge of collapse."³ When a federal judge blocked old-growth logging to save owl habitat, loggers were furious; but how many loggers were there? Logging jobs had dwindled as timber companies mechanized—and as prime timber disappeared. By 1989, many mills had already closed; logging companies were moving to other regions.⁴ The eastern Cascades, once a hub of timber wealth, were now cutover forests and former mill towns overgrown by brush.

This is a story we need to know. Industrial transformation turned out to be a bubble of promise followed by lost livelihoods and damaged landscapes. And yet: such documents are not enough. If we end the story with decay, we abandon all hope—or turn our attention to other sites of promise and ruin, promise and ruin.

What emerges in damaged landscapes, beyond the call of industrial promise and ruin? By 1989, something else had begun in Oregon's cutover forests: the wild mushroom trade. From the first it was linked to worldwide ruination: The 1986 Chernobyl disaster had contaminated Europe's mushrooms, and traders had come to the Pacific Northwest for supplies. When Japan began importing matsutake at high prices—just as jobless Indochinese refugees were settling in California—the trade went wild. Thousands rushed to Pacific Northwest forests for the new "white gold." This was in the middle of a "jobs versus the environment" battle over the forests, yet neither side noticed the mushroomers. Job advocates imagined only wage contracts for healthy white men; the foragers—disabled white veterans, Asian refugees, Native Americans, and undocumented Latinos—were invisible interlopers. Conservationists were fighting to keep human disturbance out of the forests; the entry of thousands of people, had it been noticed, would hardly have been welcome. But the mushroom hunters were mainly not noticed. At

most, the Asian presence sparked local fears of invasion: journalists worried about violence.⁵

A few years into the new century, the idea of a trade-off between jobs and the environment seemed less convincing. With or without conservation, there were fewer “jobs” in the twentieth-century sense in the United States; besides, it seemed much more likely that environmental damage would kill all of us off, jobs or no jobs. We are stuck with the problem of living despite economic and ecological ruination. Neither tales of progress nor of ruin tell us how to think about collaborative survival. It is time to pay attention to mushroom picking. Not that this will save us—but it might open our imaginations.



Geologists have begun to call our time the Anthropocene, the epoch in which human disturbance outranks other geological forces. As I write, the term is still new—and still full of promising contradictions. Thus, although some interpreters see the name as implying the triumph of humans, the opposite seems more accurate: without planning or intention, humans have made a mess of our planet.⁶ Furthermore, despite the prefix “anthropo-,” that is, human, the mess is not a result of our species biology. The most convincing Anthropocene time line begins not with our species but rather with the advent of modern capitalism, which has directed long-distance destruction of landscapes and ecologies. This time line, however, makes the “anthropo-” even more of a problem. Imagining the human since the rise of capitalism entangles us with ideas of progress and with the spread of techniques of alienation that turn both humans and other beings into resources. Such techniques have segregated humans and policed identities, obscuring collaborative survival. The concept of the Anthropocene both evokes this bundle of aspirations, which one might call the modern human conceit, and raises the hope that we might muddle beyond it. Can we live inside this regime of the human and still exceed it?

This is the predicament that makes me pause before offering a description of mushrooms and mushroom pickers. The modern human conceit won't let a description be anything more than a decorative

footnote. This “anthropo-” blocks attention to patchy landscapes, multiple temporalities, and shifting assemblages of humans and nonhumans: the very stuff of collaborative survival. In order to make mushroom picking a worthwhile tale, then, I must first chart the work of this “anthropo-” and explore the terrain it refuses to acknowledge.

Consider, indeed, the question of what’s left. Given the effectiveness of state and capitalist devastation of natural landscapes, we might ask why anything outside their plans is alive today. To address this, we will need to watch unruly edges. What brings Mien and matsutake together in Oregon? Such seemingly trivial queries might turn everything around to put unpredictable encounters at the center of things.

We hear about precarity in the news every day. People lose their jobs or get angry because they never had them. Gorillas and river porpoises hover at the edge of extinction. Rising seas swamp whole Pacific islands. But most of the time we imagine such precarity to be an exception to how the world works. It’s what “drops out” from the system. What if, as I’m suggesting, precarity *is* the condition of our time—or, to put it another way, what if our time is ripe for sensing precarity? What if precarity, indeterminacy, and what we imagine as trivial are the center of the systematicity we seek?

Precarity is the condition of being vulnerable to others. Unpredictable encounters transform us; we are not in control, even of ourselves. Unable to rely on a stable structure of community, we are thrown into shifting assemblages, which remake us as well as our others. We can’t rely on the status quo; everything is in flux, including our ability to survive. Thinking through precarity changes social analysis. A precarious world is a world without teleology. Indeterminacy, the unplanned nature of time, is frightening, but thinking through precarity makes it evident that indeterminacy also makes life possible.

The only reason all this sounds odd is that most of us were raised on dreams of modernization and progress. These frames sort out those parts of the present that might lead to the future. The rest are trivial; they “drop out” of history. I imagine you talking back: “Progress? That’s an idea from the nineteenth century.” The term “progress,” referring to a general state, has become rare; even twentieth-century modernization has begun to feel archaic. But their categories and assumptions of improvement are with us everywhere. We imagine their objects every day:

democracy, growth, science, hope. Why would we expect economies to grow and sciences to advance? Even without explicit reference to development, our theories of history are embroiled in these categories. So, too, are our personal dreams. I'll admit it's hard for me to even say this: there might not be a collective happy ending. Then why bother getting up in the morning?

Progress is embedded, too, in widely accepted assumptions about what it means to be human. Even when disguised through other terms, such as "agency," "consciousness," and "intention," we learn over and over that humans are different from the rest of the living world because we look forward—while other species, which live day to day, are thus dependent on us. As long as we imagine that humans are *made* through progress, nonhumans are stuck within this imaginative framework too.

Progress is a forward march, drawing other kinds of time into its rhythms. Without that driving beat, we might notice other temporal patterns. Each living thing remakes the world through seasonal pulses of growth, lifetime reproductive patterns, and geographies of expansion. Within a given species, too, there are multiple time-making projects, as organisms enlist each other and coordinate in making landscapes. (The regrowth of the cutover Cascades and Hiroshima's radioecology each show us multispecies time making.) The curiosity I advocate follows such multiple temporalities, revitalizing description and imagination. This is not a simple empiricism, in which the world invents its own categories. Instead, agnostic about where we are going, we might look for what has been ignored because it never fit the time line of progress.

Consider again the snippets of Oregon history with which I began this chapter. The first, about railroads, tells of progress. It led to the future: railroads reshaped our destiny. The second is already an interruption, a history in which the destruction of forests matters. What it shares with the first, however, is the assumption that the trope of progress is sufficient to know the world, both in success and failure. The story of decline offers no leftovers, no excess, nothing that escapes progress. Progress still controls us even in tales of ruination.

Yet the modern human conceit is not the only plan for making worlds: we are surrounded by many world-making projects, human and not human.⁷ World-making projects emerge from practical activities of

making lives; in the process these projects alter our planet. To see them, in the shadow of the Anthropocene's "anthropo-," we must reorient our attention. Many preindustrial livelihoods, from foraging to stealing, persist today, and new ones (including commercial mushroom picking) emerge, but we neglect them because they are not a part of progress. These livelihoods make worlds too—and they show us how to look around rather than ahead.

Making worlds is not limited to humans. We know that beavers reshape streams as they make dams, canals, and lodges; in fact, all organisms make ecological living places, altering earth, air, and water. Without the ability to make workable living arrangements, species would die out. In the process, each organism changes everyone's world. Bacteria made our oxygen atmosphere, and plants help maintain it. Plants live on land because fungi made soil by digesting rocks. As these examples suggest, world-making projects can overlap, allowing room for more than one species. Humans, too, have always been involved in multispecies world making. Fire was a tool for early humans not just to cook but also to burn the landscape, encouraging edible bulbs and grasses that attracted animals for hunting. Humans shape multispecies worlds when our living arrangements make room for other species. This is not just a matter of crops, livestock, and pets. Pines, with their associated fungal partners, often flourish in landscapes burned by humans; pines and fungi work together to take advantage of bright open spaces and exposed mineral soils. Humans, pines, and fungi make living arrangements simultaneously for themselves and for others: multispecies worlds.

Twentieth-century scholarship, advancing the modern human conceit, conspired against our ability to notice the divergent, layered, and conjoined projects that make up worlds. Entranced by the expansion of certain ways of life over others, scholars ignored questions of what else was going on. As progress tales lose traction, however, it becomes possible to look differently.

The concept of *assemblage* is helpful. Ecologists turned to assemblages to get around the sometimes fixed and bounded connotations of ecological "community." The question of how the varied species in a species assemblage influence each other—if at all—is never settled: some thwart (or eat) each other; others work together to make life possible; still others just happen to find themselves in the same place. As-

semblages are open-ended gatherings. They allow us to ask about communal effects without assuming them. They show us potential histories in the making. For my purposes, however, I need something other than organisms as the elements that gather. I need to see lifeways—and non-living ways of being as well—coming together. Nonhuman ways of being, like human ones, shift historically. For living things, species identities are a place to begin, but they are not enough: ways of being are emergent effects of encounters. Thinking about humans makes this clear. Foraging for mushrooms is a way of life—but not a common characteristic of all humans. The issue is the same for other species. Pines find mushrooms to help them use human-made open spaces. Assemblages don't just gather lifeways; they make them. Thinking through assemblage urges us to ask: How do gatherings sometimes become “happenings,” that is, greater than the sum of their parts? If history without progress is indeterminate and multidirectional, might assemblages show us its possibilities?

Patterns of unintentional coordination develop in assemblages. To notice such patterns means watching the interplay of temporal rhythms and scales in the divergent lifeways that gather. Surprisingly, this turns out to be a method that might revitalize political economy as well as environmental studies. Assemblages drag political economy inside them, and not just for humans. Plantation crops have lives different from those of their free-living siblings; cart horses and hunter steeds share species but not lifeways. Assemblages cannot hide from capital and the state; they are sites for watching how political economy works. If capitalism has no teleology, we need to see what comes together—not just by prefabrication, but also by juxtaposition.

Other authors use “assemblage” with other meanings.⁸ The qualifier “polyphonic” may help explain my variant. Polyphony is music in which autonomous melodies intertwine. In Western music, the madrigal and the fugue are examples of polyphony. These forms seem archaic and strange to many modern listeners because they were superseded by music in which a unified rhythm and melody holds the composition together. In the classical music that displaced baroque, unity was the goal; this was “progress” in just the meaning I have been discussing: a unified coordination of time. In twentieth-century rock-and-roll, this unity takes the form of a strong beat, suggestive of the listener's heart;

we are used to hearing music with a single perspective. When I first learned polyphony, it was a revelation in listening; I was forced to pick out separate, simultaneous melodies *and* to listen for the moments of harmony and dissonance they created together. This kind of noticing is just what is needed to appreciate the multiple temporal rhythms and trajectories of the assemblage.

For those not musically inclined, it may be useful to imagine the polyphonic assemblage in relation to agriculture. Since the time of the plantation, commercial agriculture has aimed to segregate a single crop and work toward its simultaneous ripening for a coordinated harvest. But other kinds of farming have multiple rhythms. In the shifting cultivation I studied in Indonesian Borneo, many crops grew together in the same field, and they had quite different schedules. Rice, bananas, taro, sweet potatoes, sugarcane, palms, and fruit trees mingled; farmers needed to attend to the varied schedules of maturation of each of these crops. These rhythms were their relation to human harvests; if we add other relations, for example, to pollinators or other plants, rhythms multiply. The polyphonic assemblage is the gathering of these rhythms, as they result from world-making projects, human and not human.

The polyphonic assemblage also moves us into the unexplored territory of the modern political economy. Factory labor is an exemplar of coordinated progress time. Yet the supply chain is infused with polyphonic rhythms. Consider the tiny Chinese garment factory studied by Nellie Chu; like its many competitors, it served multiple supply lines, constantly switching among orders for local boutique brands, knock-off international brands, and generic to-be-branded-later production.⁹ Each required different standards, materials, and kinds of labor. The factory's job was to match industrial coordination to the complex rhythms of supply chains. Rhythms further multiply when we move out of factories to watch foraging for an unpredictable wild product. The farther we stray into the peripheries of capitalist production, the more coordination between polyphonic assemblages and industrial processes becomes central to making a profit.

As the last examples suggest, abandoning progress rhythms to watch polyphonic assemblages is not a matter of virtuous desire. Progress felt great; there was always something better ahead. Progress gave us the "progressive" political causes with which I grew up. I hardly know how

to think about justice without progress. The problem is that progress stopped making sense. More and more of us looked up one day and realized that the emperor had no clothes. It is in this dilemma that new tools for noticing seem so important.¹⁰ Indeed, life on earth seems at stake. Chapter 2 turns to dilemmas of collaborative survival.