

CHAPTER 2

Tentacular Thinking

Anthropocene, Capitalocene, Chthulucene

We are all lichens.

—Scott Gilbert, “We Are All Lichens Now”

Think we must. We must think.

—Stengers and Despret, *Women Who Make a Fuss*

What happens when human exceptionalism and bounded individualism, those old saws of Western philosophy and political economics, become unthinkable in the best sciences, whether natural or social? Seriously unthinkable: not available to think with. Biological sciences have been especially potent in fermenting notions about all the mortal inhabitants of the earth since the imperializing eighteenth century. *Homo sapiens*—the Human as species, the Anthropos as the human species, Modern Man—was a chief product of these knowledge practices. What happens when the best biologies of the twenty-first century cannot do their job with bounded individuals plus contexts, when organisms plus environments, or genes plus whatever they need, no longer sustain the overflowing richness of biological knowledges, if they ever did? What happens when organisms plus environments can hardly be remembered for the same reasons that even Western-indebted people can no longer figure themselves as individuals and societies of individuals in human-

only histories? Surely such a transformative time on earth must not be named the Anthropocene!

In this chapter, with all the unfaithful offspring of the sky gods, with my littermates who find a rich wallow in multispecies muddles, I want to make a critical and joyful fuss about these matters. I want to stay with the trouble, and the only way I know to do that is in generative joy, terror, and collective thinking.

My first demon familiar in this task will be a spider, *Pimoida cthulhu*, who lives under stumps in the redwood forests of Sonoma and Mendocino Counties, near where I live in North Central California.¹ Nobody lives everywhere; everybody lives somewhere. Nothing is connected to everything; everything is connected to something.² This spider is in place, has a place, and yet is named for intriguing travels elsewhere. This spider will help me with returns, and with roots and routes.³ The eight-legged tentacular arachnid that I appeal to gets her generic name from the language of the Goshute people of Utah and her specific name from denizens of the depths, from the abyssal and elemental entities, called chthonic.⁴ The chthonic powers of Terra infuse its tissues everywhere, despite the civilizing efforts of the agents of sky gods to astralize them and set up chief Singletons and their tame committees of multiples or subgods, the One and the Many. Making a small change in the biologist's taxonomic spelling, from cthulhu to chthulu, with renamed *Pimoida chthulu* I propose a name for an elsewhere and elsewhen that was, still is, and might yet be: the Chthulucene. I remember that *tentacle* comes from the Latin *tentaculum*, meaning "feeler," and *tentare*, meaning "to feel" and "to try"; and I know that my leggy spider has many-armed allies. Myriad tentacles will be needed to tell the story of the Chthulucene.⁵

The tentacular ones tangle me in SF. Their many appendages make string figures; they entwine me in the poiesis—the making—of speculative fabulation, science fiction, science fact, speculative feminism, *soin de ficelle*, so far. The tentacular ones make attachments and detachments; they ake cuts and knots; they make a difference; they weave paths and consequences but not determinisms; they are both open and knotted in some ways and not others.⁶ SF is storytelling and fact telling; it is the patterning of possible worlds and possible times, material-semiotic worlds, gone, here, and yet to come. I work with string figures as a theoretical trope, a way to think-with a host of companions in sympoietic threading, felting, tangling, tracking, and sorting. I work with and in SF as material-semiotic composting, as theory in the mud, as muddle.⁷



2.1. *Pimosa cthulhu*. Photograph by Gustavo Hormiga.

The tentacular are not disembodied figures; they are cnidarians, spiders, fingly beings like humans and raccoons, squid, jellyfish, neural extravaganzas, fibrous entities, flagellated beings, myofibril braids, matted and felted microbial and fungal tangles, probing creepers, swelling roots, reaching and climbing tendrilled ones. The tentacular are also nets and networks, IT critters, in and out of clouds. Tentacularity is about life lived along lines—and such a wealth of lines—not at points, not in spheres. “The inhabitants of the world, creatures of all kinds, human and non-human, are wayfarers”; generations are like “a series of interlaced trails.”⁸ String figures all.

All the tentacular stringy ones have made me unhappy with post-humanism, even as I am nourished by much generative work done under that sign. My partner Rusten Hogness suggested compost instead of posthuman(ism), as well as humusities instead of humanities, and I jumped into that wormy pile.⁹ Human as humus has potential, if we could chop and shred human as Homo, the detumescing project of a self-making and planet-destroying CEO. Imagine a conference not on the Future of the Humanities in the Capitalist Restructuring University, but instead on the Power of the Humusities for a Habitable Multispecies Muddle! Ecosexual artists Beth Stephens and Annie Sprinkle made a bumper sticker for me, for us, for SF: “Composting is so hot!”¹⁰

The earth of the ongoing Chthulucene is sympoietic, not autopoietic. Mortal Worlds (Terra, Earth, Gaia, Chthulu, the myriad names and powers that are not Greek, Latin, or Indo-European at all)¹¹ do not make themselves, no matter how complex and multileveled the systems, no matter how much order out of disorder might be produced in generative autopoietic system breakdowns and relaunchings at higher levels of order. Autopoietic systems are hugely interesting—witness the history of cybernetics and information sciences; but they are not good models for living and dying worlds and their critters. Autopoietic systems are not closed, spherical, deterministic, or teleological; but they are not quite good enough models for the mortal SF world. Poiesis is symchthonic, sympoietic, always partnered all the way down, with no starting and subsequently interacting “units.”¹² The Chthulucene does not close in on itself; it does not round off; its contact zones are ubiquitous and continuously spin out loopy tendrils. Spider is a much better figure for sympoiesis than any inadequately leggy vertebrate of whatever pantheon. Tentacularity is symchthonic, wound with abyssal and dreadful graspings, frayings, and weavings, passing relays again and again, in the generative recursions that make up living and dying.

After I used the term *sympoiesis* in a grasp for something other than the lures of autopoiesis, Katie King told me about M. Beth Dempster’s Master of Environmental Studies thesis written in 1998, in which she suggested the term *sympoiesis* for “collectively-producing systems that do not have self-defined spatial or temporal boundaries. Information and control are distributed among components. The systems are evolutionary and have the potential for surprising change.” By contrast, autopoietic systems are “self-producing” autonomous units “with self defined spatial or temporal boundaries that tend to be centrally controlled, homeostatic, and predictable.”¹³ Dempster argued that many systems are mistaken for autopoietic that are really sympoietic. I think this point is important for thinking about rehabilitation (making livable again) and sustainability amid the porous tissues and open edges of damaged but still ongoing living worlds, like the planet earth and its denizens in current times being called the Anthropocene. If it is true that neither biology nor philosophy any longer supports the notion of independent organisms in environments, that is, interacting units plus contexts/rules, then sympoiesis is the name of the game in spades. Bounded (or neoliberal) individualism amended by autopoiesis is not good enough figurally or scientifically; it misleads us down deadly paths.

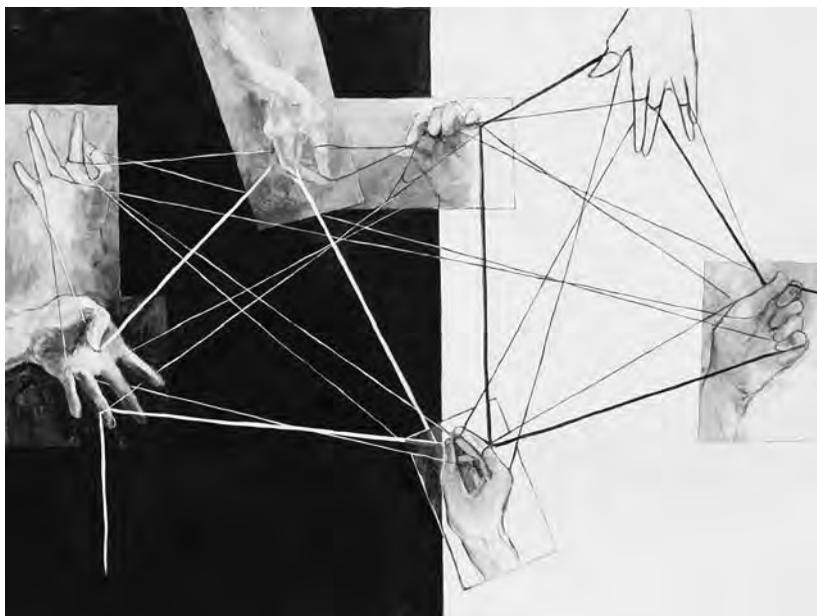
Barad's agential realism and intra-action become common sense, and perhaps a lifeline for Terran wayfarers.

SF, string figuring, is sympoietic. Thinking-with my work on cat's cradle, as well as with the work of another of her companions in thinking, Félix Guattari, Isabelle Stengers relayed back to me how players pass back and forth to each other the patterns-at-stake, sometimes conserving, sometimes proposing and inventing.

More precisely, com-menting, if it means thinking-with, that is becoming-with, is in itself a way of relaying . . . But knowing that what you take has been held out entails a particular thinking "between." It does not demand fidelity, still less fealty, rather a particular kind of loyalty, the answer to the trust of the held out hand. Even if this trust is not in "you" but in "creative uncertainty," even if the consequences and meaning of what has been done, thought or written, do not belong to you anymore than they belonged to the one you take the relay from, one way or another the relay is now in your hands, together with the demand that you do not proceed with "mechanical confidence." [In cat's cradling, at least] two pairs of hands are needed, and in each successive step, one is "passive," offering the result of its previous operation, a string entanglement, for the other to operate, only to become active again at the next step, when the other presents the new entanglement. But it can also be said that each time the "passive" pair is the one that holds, and is held by the entanglement, only to "let it go" when the other one takes the relay.¹⁴

In passion and action, detachment and attachment, this is what I call cultivating response-ability; that is also collective knowing and doing, an ecology of practices. Whether we asked for it or not, the pattern is in our hands. The answer to the trust of the held-out hand: think we must.

Marilyn Strathern is an ethnographer of thinking practices. She defines anthropology as studying relations with relations—a hugely consequential, mind- and body-altering sort of commitment.¹⁵ Nourished by her lifelong work in highland Papua New Guinea (Mt. Hagen), Strathern writes about accepting the risk of relentless contingency, of putting relations at risk with other relations, from unexpected worlds. Embodying the practice of feminist speculative fabulation in the scholarly mode, Strathern taught me—taught us—a simple but game-changing thing: "It matters what ideas we use to think other ideas."¹⁶ I compost my soul in this hot pile. The worms are not human; their undulating bodies in-



2.2. *Cat's Cradle/String Theory*, Baila Goldenthal, 2008. Oil on canvas, 36 × 48 in. Courtesy of Maurya Simon and Tamara Ambrosion.

gest and reach, and their feces fertilize worlds. Their tentacles make string figures.

It matters what thoughts think thoughts. It matters what knowledges know knowledges. It matters what relations relate relations. It matters what worlds world worlds. It matters what stories tell stories. Paintings by Baila Goldenthal are eloquent testimony to this mattering.¹⁷

What is it to surrender the capacity to think? These times called the Anthropocene are times of multispecies, including human, urgency: of great mass death and extinction; of onrushing disasters, whose unpredictable specificities are foolishly taken as unknowability itself; of refusing to know and to cultivate the capacity of response-ability; of refusing to be present in and to onrushing catastrophe in time; of unprecedented looking away. Surely, to say “unprecedented” in view of the realities of the last centuries is to say something almost unimaginable. How can we think in times of urgencies *without* the self-indulgent and self-fulfilling myths of apocalypse, when every fiber of our being is interlaced, even complicit, in the webs of processes that must somehow be engaged and repatterned? Recursively, whether we asked for it or not, the pattern

is in our hands. The answer to the trust of the held-out hand: think we must.

Instructed by Valerie Hartouni, I turn to Hannah Arendt's analysis of the Nazi war criminal Adolf Eichmann's inability to think. In that surrender of thinking lay the "banality of evil" of the particular sort that could make the disaster of the Anthropocene, with its ramped-up genocides and speciescides, come true.¹⁸ This outcome is still at stake; think we must; we must think! In Hartouni's reading, Arendt insisted that thought was profoundly different from what we might call disciplinary knowledge or science rooted in evidence, or the sorting of truth and belief or fact and opinion or good and bad. Thinking, in Arendt's sense, is not a process for evaluating information and argument, for being right or wrong, for judging oneself or others to be in truth or error. All of that is important, but not what Arendt had to say about the evil of thoughtlessness that I want to bring into the question of the geohistorical conjuncture being called the Anthropocene.

Arendt witnessed in Eichmann not an incomprehensible monster, but something much more terrifying—she saw commonplace thoughtlessness. That is, here was a human being unable to make present to himself what was absent, what was not himself, what the world in its sheer not-one-selfness is and what claims-to-be inhere in not-oneself. Here was someone who could not be a wayfarer, could not entangle, could not track the lines of living and dying, could not cultivate response-ability, could not make present to itself what it is doing, could not live in consequences or with consequence, could not compost. Function mattered, duty mattered, but the world did not matter for Eichmann. The world does not matter in ordinary thoughtlessness. The hollowed-out spaces are all filled with assessing information, determining friends and enemies, and doing busy jobs; negativity, the hollowing out of such positivity, is missed, an astonishing abandonment of thinking.¹⁹ This quality was not an emotional lack, a lack of compassion, although surely that was true of Eichmann, but a deeper surrender to what I would call immateriality, inconsequentiality, or, in Arendt's and also my idiom, thoughtlessness. Eichmann was astralized right out of the muddle of thinking into the practice of business as usual no matter what. There was no way the world could become for Eichmann and his heirs—us?—a "matter of care."²⁰ The result was active participation in genocide.

The anthropologist, feminist, cultural theorist, storyteller, and connoisseur of the tissues of heterogeneous capitalism, globalism, travel-

ing worlds, and local places Anna Tsing examines the “arts of living on a damaged planet,”²¹ or, in the subtitle of her book, “the possibility of life in Capitalist ruins.” She performs thinking of a kind that must be cultivated in the all-too-ordinary urgencies of onrushing multispecies extinctions, genocides, immiserations, and exterminations. I name these things urgencies rather than emergencies because the latter word connotes something approaching apocalypse and its mythologies. Urgencies have other temporalities, and these times are ours. These are the times we must think; these are the times of urgencies that need stories.

Following matsutake mushrooms in their fulminating assemblages of Japanese, Americans, Chinese, Koreans, Hmong, Lao, Mexicans, fungal spores and mats, oak and pine trees, mycorrhizal symbioses, pickers, buyers, shippers, restaurateurs, diners, businessmen, scientists, foresters, DNA sequencers and their changing species, and much more, Tsing practices sympoietics in edgy times. Refusing either to look away or to reduce the earth’s urgency to an abstract system of causative destruction, such as a Human Species Act or undifferentiated Capitalism, Tsing argues that precarity—failure of the lying promises of Modern Progress—characterizes the lives and deaths of all terran critters in these times. She looks for the eruptions of unexpected liveliness and the contaminated and nondeterministic, unfinished, ongoing practices of living in the ruins. She performs the force of stories; she shows in the flesh how it matters which stories tell stories as a practice of caring and thinking. “If a rush of troubled stories is the best way to tell contaminated diversity, then it’s time to make that rush part of our knowledge practices . . . Matsutake’s willingness to emerge in blasted landscapes allows us to explore the ruins that have become our collective home. To follow matsutake guides us to possibilities of coexistence within environmental disturbance. This is not an excuse for further human damage. Still, matsutake show one kind of collaborative survival.”

Driven by radical curiosity, Tsing does the ethnography of “salvage accumulation” and “patchy capitalism,” the kind that can no longer promise progress but can and does extend devastation and make precarity the name of our systematicity. There is no simple ethical, political, or theoretical point to take from Tsing’s work; there is instead the force of engaging the world in the kind of thinking practices impossible for Eichmann’s heirs. “Matsutake tell us about surviving collaboratively in disturbance and contamination. We need this skill for living in ruins.”²² This is not a longing for salvation or some other sort of optimistic

politics; neither is it a cynical quietism in the face of the depth of the trouble. Rather, Tsing proposes a commitment to living and dying with response-ability in unexpected company. Such living and dying have the best chance of cultivating conditions for ongoingness.

The ecological philosopher and multispecies ethnographer Thom van Dooren also inhabits the layered complexities of living in times of extinction, extermination, and partial recuperation; he deepens our consideration of what thinking means, of what not becoming thoughtless exacts from all of us. In his extraordinary book *Flight Ways*, van Dooren accompanies situated bird species living on the extended edge of extinction, asking what it means to hold open space for another.²³ Such holding open is far from an innocent or obvious material or ethical practice; even when successful, it exacts tolls of suffering as well as surviving as individuals and as kinds. In his examination of the practices of the North American whooping crane species survival plan, for example, van Dooren details multiple kinds of hard multispecies captivities and labors, forced life, surrogate reproductive labor, and substitute dying—none of which should be forgotten, especially in successful projects. Holding open space might—or might not—delay extinction in ways that make possible composing or recomposing flourishing naturalcultural assemblages. *Flight Ways* shows how extinction is not a point, not a single event, but more like an extended edge or a widened ledge. Extinction is a protracted slow death that unravels great tissues of ways of going on in the world for many species, including historically situated people.²⁴

Van Dooren proposes that mourning is intrinsic to cultivating response-ability. In his chapter on conservation efforts for Hawaiian crows (‘Alalā for Hawaiians, *Corvus hawaiiensis* for Linneans), whose forest homes and foods as well as friends, chicks, and mates have largely disappeared, van Dooren argues that it is not just human people who mourn the loss of loved ones, of place, of lifeways; other beings mourn as well. Corvids grieve loss. The point rests on biobehavioral studies as well as intimate natural history; neither the capacity nor the practice of mourning is a human specialty. Outside the dubious privileges of human exceptionalism, thinking people must learn to grieve-with.

Mourning is about dwelling with a loss and so coming to appreciate what it means, how the world has changed, and how we must *ourselves* change and renew our relationships if we are to move forward from here. In this context, genuine mourning should open us into an aware-

ness of our dependence on and relationships with those countless others being driven over the edge of extinction . . . The reality, however, is that there *is* no avoiding the necessity of the difficult cultural work of reflection and mourning. This work is not opposed to practical action, rather it is the foundation of any sustainable and informed response.

Grief is a path to understanding entangled shared living and dying; human beings must grieve *with*, because we are in and of this fabric of undoing. Without sustained remembrance, we cannot learn to live with ghosts and so cannot think. Like the crows and with the crows, living and dead “we are at stake in each other’s company.”²⁵

At least one more SF thread is crucial to the practice of thinking, which must be thinking-with: storytelling. It matters what thoughts think thoughts; it matters what stories tell stories. “Urban Penguins: Stories for Lost Places,” van Dooren’s chapter on Sydney Harbor’s Little Penguins (*Eudyptula minor*), succeeds in crafting a nonanthropomorphic, nonanthropocentric sense of storied place. In their resolutely “philopatric” (home loving) nesting and other life practices, these urban penguins—real, particular birds—story place, *this* place, not just any place. Establishing the reality and vivid specificity of penguin-storied place is a major material-semiotic accomplishment. Storying cannot any longer be put into the box of human exceptionalism. Without deserting the terrain of behavioral ecology and natural history, this writing achieves powerful attunement to storying in penguin multimodal semiotics.²⁶

Ursula Le Guin taught me the carrier bag theory of storytelling and of naturalcultural history. Her theories, her stories, are capacious bags for collecting, carrying, and telling the stuff of living. “A leaf a gourd a shell a net a bag a sling a sack a bottle a pot a box a container. A holder. A recipient.”²⁷ So much of earth history has been told in the thrall of the fantasy of the first beautiful words and weapons, of the first beautiful weapons *as* words and vice versa. Tool, weapon, word: that is the word made flesh in the image of the sky god; that is the Anthropos. In a tragic story with only one real actor, one real world-maker, the hero, this is the Man-making tale of the hunter on a quest to kill and bring back the terrible bounty. This is the cutting, sharp, combative tale of action that defers the suffering of glutinous, earth-rotted passivity beyond bearing. All others in the prick tale are props, ground, plot space, or prey. They don’t matter; their job is to be in the way, to be overcome, to be the road, the conduit, but not the traveler, not the begetter. The last thing

the hero wants to know is that his beautiful words and weapons will be worthless without a bag, a container, a net.

Nonetheless, no adventurer should leave home without a sack. How did a sling, a pot, a bottle suddenly get in the story? How do such lowly things keep the story going? Or maybe even worse for the hero, how do those concave, hollowed-out things, those holes in Being, from the get-go generate richer, quirkier, fuller, unfitting, ongoing stories, stories with room for the hunter but which weren't and aren't about him, the self-making human, the human-making machine of history? The slight curve of the shell that holds just a little water, just a few seeds to give away and to receive, suggests stories of becoming-with, of reciprocal induction, of companion species whose job in living and dying is not to end the storying, the worlding. With a shell and a net, becoming human, becoming humus, becoming terran, has another shape—that is, the side-winding, snaky shape of becoming-with. To think-with is to stay with the naturalcultural multispecies trouble on earth. There are no guarantees, no arrow of time, no Law of History or Science or Nature in such struggles. There is only the relentlessly contingent SF worlding of living and dying, of becoming-with and unbecoming-with, of sympoiesis, and so, just possibly, of multispecies flourishing on earth.

Like Le Guin, Bruno Latour passionately understands the need to change the story, to learn somehow to narrate—to think—outside the prick tale of Humans in History, when the knowledge of how to murder each other—and along with each other, uncountable multitudes of the living earth—is not scarce. Think we must; we must think. That means, simply, we *must* change the story; the story *must* change. Le Guin writes, “Hence it is with a certain feeling of urgency that I seek the nature, subject, words of the other story, the untold one, the life story.”²⁸ In this terrible time called the Anthropocene, Latour argues that the fundamentals of geopolitics have been blasted open. None of the parties in crisis can call on Providence, History, Science, Progress, or any other god trick outside the common fray to resolve the troubles.²⁹ A common livable world must be composed, bit by bit, or not at all. What used to be called nature has erupted into ordinary human affairs, and vice versa, in such a way and with such permanence as to change fundamentally means and prospects for going on, including going on at all. Searching for compositionist practices capable of building effective new collectives, Latour argues that we must learn to tell “Gaïa stories.” If that word is too hard, then we can call our narrations “geostories,” in which “all the

former props and passive agents have become active without, for that, being part of a giant plot written by some overseeing entity.”³⁰ Those who tell Gaia stories or geostories are the “Earthbound,” those who eschew the dubious pleasures of transcendent plots of modernity and the purifying division of society and nature. Latour argues that we face a stark divide: “Some are readying themselves to live as Earthbound in the Anthropocene; others decided to remain as Humans in the Holocene.”³¹

In much of his writing, Latour develops the language and imagery of trials of strength; and in thinking about the Anthropocene and the Earthbound, he extends that metaphor to develop the difference between a police action, where peace is restored by an already existing order, and war or politics, where real enemies must be overcome to establish what will be. Latour is determined to avoid the idols of a ready-to-hand fix, such as Laws of History, Modernity, the State, God, Progress, Reason, Decadence, Nature, Technology, or Science, as well as the debilitating disrespect for difference and shared finitude inherent in those who already know the answers toward those who only need to learn them—by force, faith, or self-certain pedagogy. Those who “believe” they have the answers to the present urgencies are terribly dangerous. Those who refuse to be *for* some ways of living and dying and not others are equally dangerous. Matters of fact, matters of concern,³² and matters of care are knotted in string figures, in SF.

Latour embraces sciences, not Science. In geopolitics, “the important point here is to realize that the facts of the matter cannot be delegated to a higher unified authority that would have done the choice *in our stead*. Controversies—no matter how spurious they might be—are no excuse to delay the *decision* about which side represents our world *better*.”³³ Latour *aligns* himself with the reports of the Intergovernmental Panel on Climate Change (IPCC); he does not *believe* its assessments and reports; he *decides* what is strong and trustworthy and what is not. He casts his lot with some worlds and worldings and not others. One need not hear Latour’s “decision” discourse with an individualist ear; he is a compositionist intent on understanding how a common world, how collectives, are built-with each other, where all the builders are not human beings. This is neither relativism nor rationalism; it is SF, which Latour would call both sciences and scientifiction and I would call both sciences and speculative fabulation—all of which are political sciences, in our aligned approaches.

“Alignment” is a rich metaphor for wayfarers, for the Earthbound,

and does not as easily as “decision” carry the tones of modernist liberal choice discourse, at least in the United States. Further, the refusal of the modernist category of belief is also crucial to my effort to persuade us to take up the Chthulucene and its tentacular tasks.³⁴ Like Stengers and like myself, Latour is a thoroughgoing materialist committed to an ecology of practices, to the mundane articulating of assemblages through situated work and play in the muddle of messy living and dying. Actual players, articulating with varied allies of all ontological sorts (molecules, colleagues, and much more), must compose and sustain what is and will be. Alignment in tentacular worlding must be a seriously tangled affair!

Intent on the crucial refusal of self-certainty and preexisting god tricks, which I passionately share, Latour turns to a resource—relentless reliance on the material-semiotic trope of trials of strength—that, I think, makes it unnecessarily hard to tell his and our needed new story. He defines war as the absence of a referee so that trials of strength must determine the legitimate authority. Humans in History and the Earthbound in the Anthropocene are engaged in trials of strength where there is no Referee who/which can establish what is/was/will be. History versus Gaia stories are at stake. Those trials—the war of the Earthbound with the Humans—would not be conducted with rockets and bombs; they would be conducted with every other imaginable resource and with no god trick from above to decide life and death, truth and error. But still, we are in the story of the hero and the first beautiful words and weapons, not in the story of the carrier bag. Anything not decided in the presence of the Authority is war; Science (singular and capitalized) is the Authority; the Authority conducts police actions. In contrast, sciences (always rooted in practices) are war. Therefore, in Latour’s passionate speculative fabulation, such war is our only hope for real politics. The past is as much the contested zone as the present or future.

Latour’s thinking and stories need a specific kind of enemies. He draws on Carl Schmitt’s “political theology,” which is a theory of peace through war, with the enemy as *hostis*, with all its tones of host, hostage, guest, and worthy enemy. Only with such an enemy, Schmitt and Latour hold, is there respect and a chance to be less, not more, deadly in conflict. Those who operate within the categories of Authority and of belief are notoriously prone to exterminationist and genocidal combat (it’s hard to deny that!). They are lost without a pre-established Referee. The *hostis* demands much better. But all the action remains within the narrative vise of trials of strength, of mortal combat, within which

the knowledge of how to murder each other remains well entrenched. Latour makes clear that he does not *want* this story, but he does not propose another. The only real possibility for peace lies in the tale of the respected enemy, the *hostis*, and trials of strength. “But when you are at war, it is only through the throes of the encounters that the authority you have or don’t have will be decided *depending whether you win or lose*.”³⁵

Schmitt’s enemies do not allow the story to change in its marrow; the Earthbound need a more tentacular, less binary life story. Latour’s Gaia stories deserve better companions in storytelling than Schmitt. The question of whom to think-with is immensely material. I do not think Latour’s dilemma can be resolved in the terms of the Anthropocene. His Earthbound will have to trek into the Chthulucene to entangle with the ongoing, snaky, unheroic, tentacular, dreadful ones, the ones which/who craft material-semiotic netbags of little use in trials of strength but of great use in bringing home and sharing the means of living and dying well, perhaps even the means of ecological recuperation for human and more-than-human critters alike.

Shaping her thinking about the times called Anthropocene and “multi-faced Gaia” (Stengers’s term) in companionable friction with Latour, Isabelle Stengers does not ask that we recompose ourselves to become able, perhaps, to “face Gaia.” But like Latour and even more like Le Guin, one of her most generative SF writers, Stengers is adamant about changing the story. Focusing on intrusion rather than composition, Stengers calls Gaia a fearful and devastating power that intrudes on our categories of thought, that intrudes on thinking itself.³⁶ Earth/Gaia is maker and destroyer, not resource to be exploited or ward to be protected or nursing mother promising nourishment. Gaia is not a person but complex systemic phenomena that compose a living planet. Gaia’s intrusion into our affairs is a radically materialist event that collects up multitudes. This intrusion threatens not life on earth itself—microbes will adapt, to put it mildly—but threatens the livability of earth for vast kinds, species, assemblages, and individuals in an “event” already under way called the Sixth Great Extinction.³⁷

Stengers, like Latour, evokes the name of Gaia in the way James Lovelock and Lynn Margulis did, to name complex nonlinear couplings between processes that compose and sustain entwined but nonadditive subsystems as a partially cohering systemic whole.³⁸ In this hypothesis, Gaia is autopoietic—self-forming, boundary maintaining, contingent,

dynamic, and stable under some conditions but not others. Gaia is not reducible to the sum of its parts, but achieves finite systemic coherence in the face of perturbations within parameters that are themselves responsive to dynamic systemic processes. Gaia does not and could not care about human or other biological beings' intentions or desires or needs, but Gaia puts into question our very existence, we who have provoked its brutal mutation that threatens both human and nonhuman livable presents and futures. Gaia is not about a list of questions waiting for rational policies;³⁹ Gaia is an intrusive event that undoes thinking as usual. "She is what specifically questions the tales and refrains of modern history. There is only one real mystery at stake, here: it is the answer we, meaning those who belong to this history, may be able to create as we face the consequences of what we have provoked."⁴⁰

Anthropocene

So, what have we provoked? Writing in the midst of California's historic multiyear drought and the explosive fire season of 2015, I need the photograph of a fire set deliberately in June 2009 by Sustainable Resource Alberta near the Saskatchewan River Crossing on the Icefields Parkway in order to stem the spread of mountain pine beetles, to create a fire barrier to future fires, and to enhance biodiversity. The hope is that this fire acts as an ally for resurgence. The devastating spread of the pine beetle across the North American West is a major chapter of climate change in the Anthropocene. So too are the predicted megadroughts and the extreme and extended fire seasons. Fire in the North American West has a complicated multispecies history; fire is an essential element for ongoing, as well as an agent of double death, the killing of ongoingness. The material semiotics of fire in our times are at stake.

Thus it is past time to turn directly to the time-space-global thing called Anthropocene.⁴¹ The term seems to have been coined in the early 1980s by University of Michigan ecologist Eugene Stoermer (d. 2012), an expert in freshwater diatoms. He introduced the term to refer to growing evidence for the transformative effects of human activities on the earth. The name Anthropocene made a dramatic star appearance in globalizing discourses in 2000 when the Dutch Nobel Prize-winning atmospheric chemist Paul Crutzen joined Stoermer to propose that human activities had been of such a kind and magnitude as to merit the use of a new geological term for a new epoch, superseding the Holocene,



2.3. Icon for the Anthropocene: Flaming Forests. From Rocky Mountain House, Alberta, Canada, June 2, 2009. Photograph by Cameron Strandberg.

which dated from the end of the last ice age, or the end of the Pleistocene, about twelve thousand years ago. Anthropogenic changes signaled by the mid-eighteenth-century steam engine and the planet-changing exploding use of coal were evident in the airs, waters, and rocks.⁴² Evidence was mounting that the acidification and warming of the oceans are rapidly decomposing coral reef ecosystems, resulting in huge ghostly white skeletons of bleached and dead or dying coral. That a symbiotic system—coral, with its watery world-making associations of cnidarians and zooanthellae with many other critters too—indicated such a global transformation will come back into our story.

But for now, notice that the Anthropocene obtained purchase in popular and scientific discourse in the context of ubiquitous urgent efforts to find ways of talking about, theorizing, modeling, and managing a Big Thing called Globalization. Climate-change modeling is a powerful positive feedback loop provoking change-of-state in systems of political and ecological discourses.⁴³ That Paul Crutzen was both a Nobel laureate and an atmospheric chemist mattered. By 2008, many scientists around the world had adopted the not-yet-official but increasingly indispensable term;⁴⁴ and myriad research projects, performances, installations, and conferences in the arts, social sciences, and humanities found the

term mandatory in their naming and thinking, not least for facing both accelerating extinctions across all biological taxa and also multispecies, including human, immiseration across the expanse of Terra. Fossil-burning human beings seem intent on making as many new fossils as possible as fast as possible. They will be read in the strata of the rocks on the land and under the waters by the geologists of the very near future, if not already. Perhaps, instead of the fiery forest, the icon for the Anthropocene should be Burning Man!⁴⁵

The scale of burning ambitions of fossil-making man—of this Anthropos whose hot projects for accelerating extinctions merits a name for a geological epoch—is hard to comprehend. Leaving aside all the other accelerating extractions of minerals, plant and animal flesh, human homelands, and so on, surely, we want to say, the pace of development of renewable energy technologies and of political and technical carbon pollution-abatement measures, in the face of palpable and costly ecosystem collapses and spreading political disorders, will mitigate, if not eliminate, the burden of planet-warming excess carbon from burning still more fossil fuels. Or, maybe the financial troubles of the global coal and oil industries by 2015 would stop the madness. Not so. Even casual acquaintance with the daily news erodes such hopes, but the trouble is worse than what even a close reader of IPCC documents and the press will find. In “The Third Carbon Age,” Michael Klare, a professor of Peace and World Security Studies at Hampshire College, lays out strong evidence against the idea that the old age of coal, replaced by the recent age of oil, will be replaced by the age of renewables.⁴⁶ He details the large and growing global national and corporate investments in renewables; clearly, there are big profit and power advantages to be had in this sector. And at the same time, every imaginable, and many unimaginable, technologies and strategic measures are being pursued by all the big global players to extract every last calorie of fossil carbon, at whatever depth and in whatever formations of sand, mud, or rock, and with whatever horrors of travel to distribution and use points, to burn before someone else gets at that calorie and burns it first in the great prick story of the first and the last beautiful words and weapons.⁴⁷ In what he calls the Age of Unconventional Oil and Gas, hydro-fracking is the tip of the (melting) iceberg. Melting of the polar seas, terrible for polar bears and for coastal peoples, is very good for big competitive military, exploration, drilling, and tanker shipping across the northern passages. Who needs an ice-breaker when you can count on melting ice?⁴⁸

A complex systems engineer named Brad Werner addressed a session at the meetings of the American Geophysical Union in San Francisco in 2012. His point was quite simple: scientifically speaking, global capitalism “has made the depletion of resources so rapid, convenient and barrier-free that ‘earth-human systems’ are becoming dangerously unstable in response.” Therefore, he argued, the only scientific thing to do is revolt! Movements, not just individuals, are critical. What is required is action and thinking that do not fit within the dominant capitalist culture; and, said Werner, this is a matter not of opinion, but of geophysical dynamics. The reporter who covered this session summed up Werner’s address: “He is saying that his research shows that our entire economic paradigm is a threat to ecological stability.”⁴⁹ Werner is not the first or the last researcher and maker of matters of concern to argue this point, but his clarity at a scientific meeting is bracing. Revolt! Think we must; we must think. Actually think, not like Eichmann the Thoughtless. Of course, the devil is in the details—how to revolt? How to matter and not just want to matter?

Capitalocene

But at least one thing is crystal clear. No matter how much he might be caught in the generic masculine universal and how much he only looks up, the Anthropos did not do this fracking thing and he should not name this double-death-loving epoch. The Anthropos is not Burning Man after all. But because the word is already well entrenched and seems less controversial to many important players compared to the Capitalocene, I know that we will continue to need the term *Anthropocene*. I will use it too, sparingly; what and whom the Anthropocene collects in its refurbished netbag might prove potent for living in the ruins and even for modest terran recuperation.

Still, if we could only have one word for these SF times, surely it must be the Capitalocene.⁵⁰ Species Man did not shape the conditions for the Third Carbon Age or the Nuclear Age. The story of Species Man as the agent of the Anthropocene is an almost laughable rerun of the great phallic humanizing and modernizing Adventure, where man, made in the image of a vanished god, takes on superpowers in his secular-sacred ascent, only to end in tragic detumescence, once again. Autopoietic, self-making man came down once again, this time in tragic system failure, turning biodiverse ecosystems into flipped-out deserts of slimy mats



2.4. Icon for the Capitalocene: Sea Ice Clearing from the Northwest Passage, Data 2012. NASA Visible Earth image by Jesse Allen, 2015, using data from the Land Atmosphere Near Real-Time Capability for EOS (LANCE). National Snow and Ice Data Center.

and stinging jellyfish. Neither did technological determinism produce the Third Carbon Age. Coal and the steam engine did not determine the story, and besides the dates are all wrong, not because one has to go back to the last ice age, but because one has to at least include the great market and commodity reworldings of the long sixteenth and seventeenth centuries of the current era, even if we think (wrongly) that we can remain Euro-centered in thinking about “globalizing” transformations shaping the Capitalocene.⁵¹ One must surely tell of the networks of sugar, precious metals, plantations, indigenous genocides, and slavery, with their labor innovations and relocations and recompositions of critters and things sweeping up both human and nonhuman workers of all kinds. The infectious industrial revolution of England mattered hugely, but it is only one player in planet-transforming, historically situated, new enough, worlding relations. The relocation of peoples, plants, and animals; the leveling of vast forests; and the violent mining of metals preceded the steam engine; but that is not a warrant for wringing one’s hands about the perfidy of the Anthropos, or of Species Man, or of Man the Hunter.

The systemic stories of the linked metabolisms, articulations, or coproductions (pick your metaphor) of economies and ecologies, of histories and human and nonhuman critters, must be relentlessly opportunistic and contingent. They must also be relentlessly relational, sympoietic, and consequential.⁵² They are terran, not cosmic or blisped or cursed into outer space. The Capitalocene is terran; it does not have to be the last biodiverse geological epoch that includes our species too. There are so many good stories yet to tell, so many netbags yet to string, and not just by human beings.

As a provocation, let me summarize my objections to the Anthropocene as a tool, story, or epoch to think with: (1) The myth system associated with the Anthropos is a setup, and the stories end badly. More to the point, they end in double death; they are not about ongoingness. It is hard to tell a good story with such a bad actor. Bad actors need a story, but not the whole story. (2) Species Man does not make history. (3) Man plus Tool does not make history. That is the story of History human exceptionalists tell. (4) That History must give way to geostories, to Gaia stories, to symchthonic stories; terrans do webbed, braided, and tentacular living and dying in sympoietic multispecies string figures; they do not do History. (5) The human social apparatus of the Anthropocene tends to be top-heavy and bureaucracy prone. Revolt needs other forms of action and other stories for solace, inspiration, and effectiveness. (6) Despite its reliance on agile computer modeling and autopoietic systems theories, the Anthropocene relies too much on what should be an “un-thinkable” theory of relations, namely the old one of bounded utilitarian individualism—preexisting units in competition relations that take up all the air in the atmosphere (except, apparently, carbon dioxide). (7) The sciences of the Anthropocene are too much contained within restrictive systems theories and within evolutionary theories called the Modern Synthesis, which for all their extraordinary importance have proven unable to think well about sympoiesis, symbiosis, symbiogenesis, development, webbed ecologies, and microbes. That’s a lot of trouble for adequate evolutionary theory. (8) Anthropocene is a term most easily meaningful and usable by intellectuals in wealthy classes and regions; it is not an idiomatic term for climate, weather, land, care of country, or much else in great swathes of the world, especially but not only among indigenous peoples.

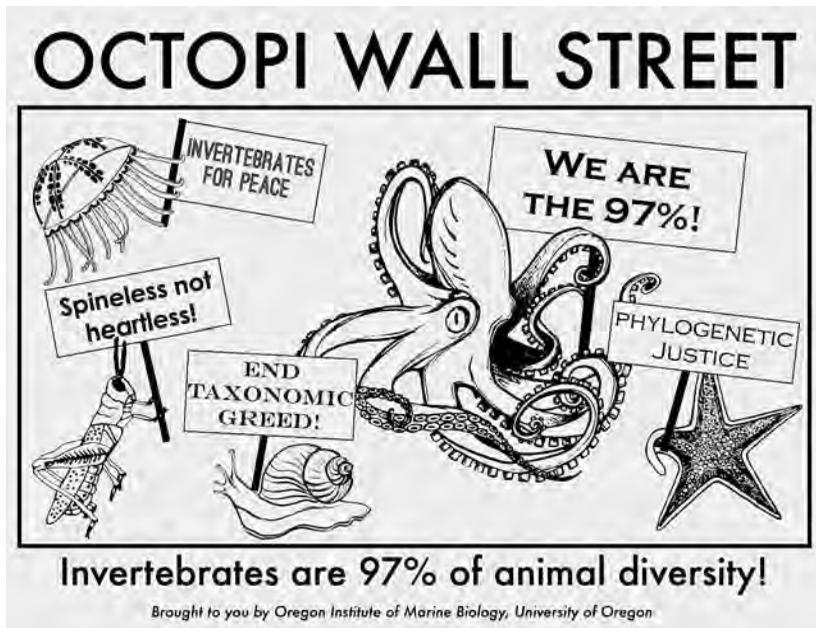
I am aligned with feminist environmentalist Eileen Crist when she writes against the managerial, technocratic, market-and-profit besotted,

modernizing, and human-exceptionalist business-as-usual commitments of so much Anthropocene discourse. This discourse is not simply wrong-headed and wrong-hearted in itself; it also saps our capacity for imagining and caring for other worlds, both those that exist precariously now (including those called wilderness, for all the contaminated history of that term in racist settler colonialism) and those we need to bring into being in alliance with other critters, for still possible recuperating pasts, presents, and futures. “Scarcity’s deepening persistence, and the suffering it is auguring for all life, is an artifact of human exceptionalism at every level.” Instead, a humanity with more earthly integrity “invites the *priority* of our pulling back and scaling down, of welcoming limitations of our numbers, economies, and habitats for the sake of a higher, more inclusive freedom and quality of life.”⁵³

If Humans live in History and the Earthbound take up their task within the Anthropocene, too many Posthumans (and posthumanists, another gathering altogether) seem to have emigrated to the Anthropocene for my taste. Perhaps my human and nonhuman people are the dreadful Chthonic ones who snake within the tissues of Terrapolis.

Note that insofar as the Capitalocene is told in the idiom of fundamentalist Marxism, with all its trappings of Modernity, Progress, and History, that term is subject to the same or fiercer criticisms. The stories of both the Anthropocene and the Capitalocene teeter constantly on the brink of becoming much Too Big. Marx did better than that, as did Darwin. We can inherit their bravery and capacity to tell big-enough stories without determinism, teleology, and plan.⁵⁴

Historically situated relational worldings make a mockery both of the binary division of nature and society and of our enslavement to Progress and its evil twin, Modernization. The Capitalocene was relationally made, and not by a secular godlike anthropos, a law of history, the machine itself, or a demon called Modernity. The Capitalocene must be relationally unmade in order to compose in material-semiotic SF patterns and stories something more livable, something Ursula K. Le Guin could be proud of. Shocked anew by our—billions of earth habitant’s, including your and my—ongoing daily assent in practice to this thing called capitalism, Philippe Pignarre and Isabelle Stengers note that denunciation has been singularly ineffective, or capitalism would have long ago vanished from the earth. A dark bewitched commitment to the lure of Progress (and its polar opposite) lashes us to endless infernal alternatives, as if we had no other ways to reworld, reimagine, relive, and



2.5. *Octopi Wall Street*: Symchthonic revolt. Art by Marley Jarvis, Laurel Hiebert, Kira Treibergs, 2011. Oregon Institute of Marine Biology.

reconnect with each other, in multispecies well-being. This explication does not excuse us from doing many important things better; quite the opposite. Pignarre and Stengers affirm on-the-ground collectives capable of inventing new practices of imagination, resistance, revolt, repair, and mourning, and of living and dying well. They remind us that the established disorder is not necessary; another world is not only urgently needed, it is possible, but not if we are ensorcelled in despair, cynicism, or optimism, and the belief/disbelief discourse of Progress.⁵⁵ Many Marxist critical and cultural theorists, at their best, would agree.⁵⁶ So would the tentacular ones.⁵⁷

Chthulucene

Reaching back to generative complex systems approaches by Lovelock and Margulis, Gaia figures the Anthropocene for many contemporary Western thinkers. But an unfurling Gaia is better situated in the Chthulucene, an ongoing temporality that resists figuration and dating and demands myriad names. Arising from Chaos,⁵⁸ Gaia was and is a power-

ful intrusive force, in no one's pocket, no one's hope for salvation, capable of provoking the late twentieth century's best autopoietic complex systems thinking that led to recognizing the devastation caused by anthropogenic processes of the last few centuries, a necessary counter to the Euclidean figures and stories of Man.⁵⁹ Brazilian anthropologists and philosophers Eduardo Viveiros de Castro and Déborah Danowski exorcise lingering notions that Gaia is confined to the ancient Greeks and subsequent Eurocultures in their refiguring the urgencies of our times in the post-Eurocentric conference "The Thousand Names of Gaia."⁶⁰ Names, not faces, not morphs of the same, something else, a thousand somethings else, still telling of linked ongoing generative and destructive worlding and reworlding in this age of the earth. We need another figure, a thousand names of something else, to erupt out of the Anthropocene into another, big-enough story. Bitten in a California redwood forest by spidery *Pimonia chthulhu*, I want to propose snaky Medusa and the many unfinished worldings of her antecedents, affiliates, and descendants. Perhaps Medusa, the only mortal Gorgon, can bring us into the holobiomes of Terrapolis and heighten our chances for dashing the twenty-first-century ships of the Heroes on a living coral reef instead of allowing them to suck the last drop of fossil flesh out of dead rock.

The terra-cotta figure of Potnia Theron, the Mistress of the Animals, depicts a winged goddess wearing a split skirt and touching a bird with each hand.⁶¹ She is a vivid reminder of the breadth, width, and temporal reach into pasts and futures of chthonic powers in Mediterranean and Near Eastern worlds and beyond.⁶² Potnia Theron is rooted in Minoan and then Mycenaean cultures and infuses Greek stories of the Gorgons (especially the only mortal Gorgon, Medusa) and of Artemis. A kind of far-traveling Ur-Medusa, the Lady of the Beasts is a potent link between Crete and India. The winged figure is also called Potnia Melissa, Mistress of the Bees, draped with all their buzzing-stinging-honeyed gifts. Note the acoustic, tactile, and gustatory senses elicited by the Mistress and her sympoietic, more-than-human flesh. The snakes and bees are more like stinging tentacular feelers than like binocular eyes, although these critters see too, in compound-eyed insectile and many-armed optics.

In many incarnations around the world, the winged bee goddesses are very old, and they are much needed now.⁶³ Potnia Theron/Melissa's snaky locks and Gorgon face tangle her with a diverse kinship of chthonic earthly forces that travel richly in space and time. The Greek word Gorgon translates as dreadful, but perhaps that is an astralized, patriarchal hear-



2.6. Icon for the Chthulucene. Potnia Theron with a Gorgon Face. Type of Potnia Theron, Kameiros, Rhodes, circa 600 BCE, terracotta, 13 in. diameter, British Museum, excavated by Auguste Salzmann and Sir Alfred Bilotti; purchased 1860. Photograph by Marie-Lan Nguyen, © 2007.

ing of much more awe-ful stories and enactments of generation, destruction, and tenacious, ongoing terran finitude. Potnia Theron/Melissa/Medusa give faciality a profound makeover, and that is a blow to modern humanist (including technohumanist) figurations of the forward-looking, sky-gazing Anthropos. Recall that the Greek *chthonios* means “of, in, or under the earth and the seas”—a rich terran muddle for SF, science fact, science fiction, speculative feminism, and speculative fabulation. The chthonic ones are precisely not sky gods, not a foundation for the Olympiad, not friends to the Anthropocene or Capitalocene, and definitely not finished. The Earthbound can take heart—as well as action.

The Gorgons are powerful winged chthonic entities without a proper genealogy; their reach is lateral and tentacular; they have no settled lineage and no reliable kind (genre, gender), although they are figured and

storied as female. In old versions, the Gorgons twine with the Erinyes (Furies), chthonic underworld powers who avenge crimes against the natural order. In the winged domains, the bird-bodied Harpies carry out these vital functions.⁶⁴ Now, look again at the birds of Potnia Theron and ask what they do. Are the Harpies their cousins? Around 700 BCE Hesiod imagined the Gorgons as sea demons and gave them sea deities for parents. I read Hesiod's *Theogony* as laboring to stabilize a very bumptious queer family. The Gorgons erupt more than emerge; they are intrusive in a sense akin to what Stengers understands by Gaia.

The Gorgons turned men who looked into their living, venomous, snake-encrusted faces into stone. I wonder what might have happened if those men had known how to politely greet the dreadful chthonic ones. I wonder if such manners can still be learned, if there is time to learn now, or if the stratigraphy of the rocks will only register the ends and end of a stony Anthropos.⁶⁵

Because the deities of the Olympiad identified her as a particularly dangerous enemy to the sky gods' succession and authority, mortal Medusa is especially interesting for my efforts to propose the Chthulucene as one of the big-enough stories in the netbag for staying with the trouble of our ongoing epoch. I resignify and twist the stories, but no more than the Greeks themselves constantly did.⁶⁶ The hero Perseus was dispatched to kill Medusa; and with the help of Athena, head-born favorite daughter of Zeus, he cut off the Gorgon's head and gave it to his accomplice, this virgin goddess of wisdom and war. Putting Medusa's severed head face-forward on her shield, the Aegis, Athena, as usual, played traitor to the Earthbound; we expect no better from motherless mind children. But great good came of this murder-for-hire, for from Medusa's dead body came the winged horse Pegasus. Feminists have a special friendship with horses. Who says these stories do not still move us materially?⁶⁷ And from the blood dripping from Medusa's severed head came the rocky corals of the western seas, remembered today in the taxonomic names of the Gorgonians, the coral-like sea fans and sea whips, composed in symbioses of tentacular animal cnidarians and photosynthetic algal-like beings called zooanthellae.⁶⁸

With the corals, we turn definitively away from heady facial representations, no matter how snaky. Even Potnia Theron, Potnia Melissa, and Medusa cannot alone spin out the needed tentacularities. In the tasks of thinking, figuring, and storytelling, the spider of my first pages, *Pimoid chthulhu*, allies with the decidedly nonvertebrate critters of the

seas. Corals align with octopuses, squids, and cuttlefish. Octopuses are called spiders of the seas, not only for their tentacularity, but also for their predatory habits. The tentacular chthonic ones have to eat; they are at table, *cum panis*, companion species of terra. They are good figures for the luring, beckoning, gorgeous, finite, dangerous precariousities of the Chthulucene. This Chthulucene is neither sacred nor secular; this earthly worlding is thoroughly terran, muddled, and mortal—and at stake now.

Mobile, many-armed predators, pulsating through and over the coral reefs, octopuses are called spiders of the sea. And so *Pimoida chthulhu* and *Octopus cyanea* meet in the webbed tales of the Chthulucene.⁶⁹

All of these stories are a lure to proposing the Chthulucene as a needed third story, a third netbag for collecting up what is crucial for ongoing, for staying with the trouble.⁷⁰ The chthonic ones are not confined to a vanished past. They are a buzzing, stinging, sucking swarm now, and human beings are not in a separate compost pile. We are humus, not Homo, not anthropos; we are compost, not posthuman. As a suffix, the word *ka-inos*, “-cene,” signals new, recently made, fresh epochs of the thick present. To renew the biodiverse powers of terra is the sympoietic work and play of the Chthulucene. Specifically, unlike either the Anthropocene or the Capitalocene, the Chthulucene is made up of ongoing multispecies stories and practices of becoming-with in times that remain at stake, in precarious times, in which the world is not finished and the sky has not fallen—yet. We are at stake to each other. Unlike the dominant dramas of Anthropocene and Capitalocene discourse, human beings are not the only important actors in the Chthulucene, with all other beings able simply to react. The order is reknitted: human beings are with and of the earth, and the biotic and abiotic powers of this earth are the main story.

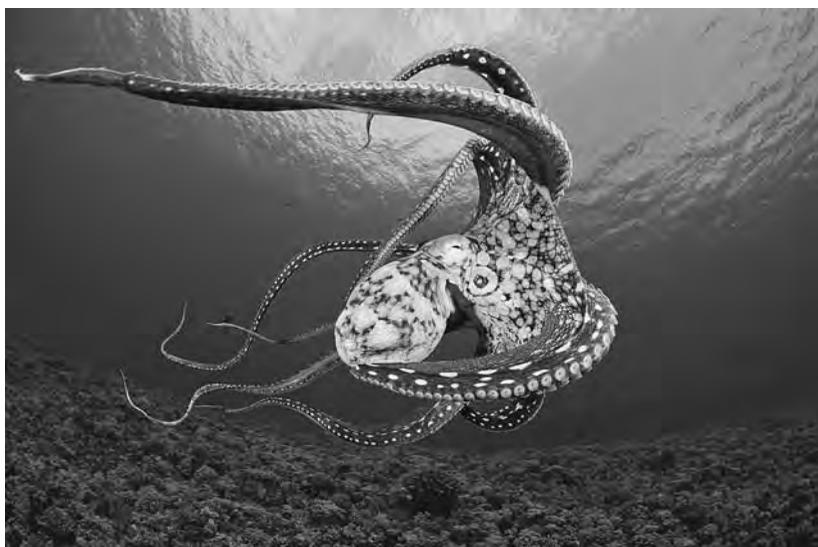
However, the doings of situated, actual human beings matter. It matters with which ways of living and dying we cast our lot rather than others. It matters not just to human beings, but also to those many critters across taxa which and whom we have subjected to exterminations, extinctions, genocides, and prospects of futurelessness. Like it or not, we are in the string figure game of caring for and with precarious worldings made terribly more precarious by fossil-burning man making new fossils as rapidly as possible in orgies of the Anthropocene and Capitalocene. Diverse human and nonhuman players are necessary in every fiber of the tissues of the urgently needed Chthulucene story. The chief actors are not restricted to the too-big players in the too-big stories of Capitalism and the Anthropos, both of which invite odd apocalyptic panics and

even odder disengaged denunciations rather than attentive practices of thought, love, and care.

Both the Anthropocene and the Capitalocene lend themselves too readily to cynicism, defeatism, and self-certain and self-fulfilling predictions, like the “game over, too late” discourse I hear all around me these days, in both expert and popular discourses, in which both technotheocratic geoengineering fixes and wallowing in despair seem to coinfect any possible common imagination. Encountering the sheer not-us, more-than-human worlding of the coral reefs, with their requirements for ongoing living and dying of their myriad critters, is also to encounter the knowledge that at least 250 million human beings today depend directly on the ongoing integrity of these holobiomes for their own ongoing living and dying well. Diverse corals and diverse people and peoples are at stake to and with each other. Flourishing will be cultivated as a multi-species response-ability without the arrogance of the sky gods and their minions, or else biodiverse terra will flip out into something very slimy, like any overstressed complex adaptive system at the end of its abilities to absorb insult after insult.

Corals helped bring the Earthbound into consciousness of the Anthropocene in the first place. From the start, uses of the term *Anthropocene* emphasized human-induced warming and acidification of the oceans from fossil-fuel-generated CO₂ emissions. Warming and acidification are known stressors that sicken and bleach coral reefs, killing the photosynthesizing zooanthellae and so ultimately their cnidarian symbionts and all of the other critters belonging to myriad taxa whose worlding depends on intact reef systems. Corals of the seas and lichens of the land also bring us into consciousness of the Capitalocene, in which deep-sea mining and drilling in oceans and fracking and pipeline construction across delicate lichen-covered northern landscapes are fundamental to accelerating nationalist, transnationalist, and corporate unworlding.

But coral and lichen symbionts also bring us richly into the storied tissues of the thickly present Chthulucene, where it remains possible—just barely—to play a much better SF game, in nonarrogant collaboration with all those in the muddle. We are all lichens; so we can be scraped off the rocks by the Furies, who still erupt to avenge crimes against the earth. Alternatively, we can join in the metabolic transformations between and among rocks and critters for living and dying well. “‘Do you realize,’ the phytolinguist will say to the aesthetic critic, ‘that [once upon a time] they couldn’t even read Eggplant?’ And they will smile at our



2.7. Day octopus, *Octopus cyanea*, in the water near Lanai, Hawaii.
Photograph by David Fleetham. © OceanwideImages.com.

ignorance, as they pick up their rucksacks and hike on up to read the newly deciphered lyrics of the lichen on the north face of Pike's Peak."⁷¹

Attending to these ongoing matters returns me to the question that began this chapter. What happens when human exceptionalism and the utilitarian individualism of classical political economics become unthinkable in the best sciences across the disciplines and interdisciplines? Seriously unthinkable: not available to think with. Why is it that the epochal name of the Anthropos imposed itself at just the time when understandings and knowledge practices about and within symbiogenesis and sympoietics are wildly and wonderfully available and generative in all the humusities, including noncolonizing arts, sciences, and politics? What if the doleful doings of the Anthropocene and the unworldings of the Capitalocene are the last gasps of the sky gods, not guarantors of the finished future, game over? It matters which thoughts think thoughts. We must think!

The unfinished Chthulucene must collect up the trash of the Anthropocene, the exterminism of the Capitalocene, and chipping and shredding and layering like a mad gardener, make a much hotter compost pile for still possible pasts, presents, and futures.

Sympoiesis

Symbiogenesis and the Lively Arts of Staying with the Trouble

Symbiogenesis

Sympoiesis is a simple word; it means “making-with.” Nothing makes itself; nothing is really autopoietic or self-organizing. In the words of the Inupiat computer “world game,” earthlings are *never alone*.¹ That is the radical implication of sympoiesis. *Sympoiesis* is a word proper to complex, dynamic, responsive, situated, historical systems. It is a word for worlding-with, in company. Sympoiesis enfolds autopoiesis and generatively unfurls and extends it.

The vivid four-by-six-foot painting called *Endosymbiosis* hangs in the hallway joining the Departments of Geosciences and Biology at UMass Amherst, near the Life and Earth Café, surely a spatial clue to how critters become-with each other.² Perhaps as sensual molecular curiosity and definitely as insatiable hunger, irresistible attraction toward enfold-ing each other is the vital motor of living and dying on earth. Critters interpenetrate one another, loop around and through one another, eat each another, get indigestion, and partially digest and partially assimilate one another, and thereby establish sympoietic arrangements that are otherwise known as cells, organisms, and ecological assemblages.