



What Is It Like to Become a Bat? Heterogeneities in an Age of Extinction

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Abstract In his celebrated 1974 essay “What Is It Like to Be a Bat?,” Thomas Nagel stages a human-bat encounter to illustrate and support his claim that “subjective experience” is irreducible to “objective fact”: because Nagel cannot experience the world as a bat does, he will never know what it is like to be one. In Nagel’s account, heterogeneity is figured negatively—as a failure or lack of resemblance—and functions to constrain his knowledge of bats. Today, as white-nose syndrome threatens bat populations across North America, might figuring heterogeneity positively, as a condition of creativity, open up new modes of receptivity and responsiveness to species extinctions? This essay turns to philosophies of becoming and to recent research in the biological sciences to explore this possibility. I suggest that attending to the heterogeneity of experience alerts us to more public dimensions of our being and may thereby work against the tendency to understand and experience ourselves as self-contained and closed off from one another and the world we share in common. This may in turn enhance our sense of entanglement with the events, bodies, and forces on the “outside” of experience, including bats and the white-nose syndrome with which they are afflicted today. Such an affirmation of heterogeneity as a condition of creativity holds the greatest promise for multispecies ethics today, I propose, when it is joined to an affirmation of incompatibilities within and between things as a real force of suffering and destruction in a heterogeneous world.

Keywords heterogeneity, becoming, encounters, multispecies ethics, extinction

Introduction

What emerges from an encounter of previously unacquainted assemblages? What initiates such encounters, and what might they signal, if anything, about the condition of the wider world in which they occur? These days we are witnessing with unusual frequency encounters that are themselves . . . unusual: a young seal on a cattle farm in Australia, for example, twenty-one miles from the nearest ocean; a sea lion seeking refuge beneath an SUV on the busy streets of San Francisco; a polar bear traversing a Canadian village, almost as if planned, on Halloween.¹ Surely such encounters raise

1. Juaregui, “Baby Seal”; Marine Mammal Center, “A Sea Lion on the Streets of San Francisco,” May 6, 2015, www.marinemammalcenter.org/about-us/News-Room/2015-news-archives/rubbish.html; Holthaus, “Canadian Town.”

Figure 1. A young seal on an Australian cattle farm. Photograph courtesy of Stacey Lee



questions of belonging, but do they qualify as political? Do they merit ethical attention, and if so, what would be the basis and criteria of such an ethics?

This essay approaches what is sometimes referred to as the Anthropocene as a period marked by a proliferation of “unusual encounters.”² Encounters are, by their very nature, both plural and diverse; encounters are “engagements across difference,” confrontations, for example, between “beings of biologically different origins.”³ Unusual encounters are unusual in the sense that they bring familiar kinds of things together in unfamiliar and perhaps slightly unsettling ways. Of course, the impact of such encounters exceeds any low-grade sense of unease they might engender among human beings. Unusual encounters known as “species introductions,” for instance—a key driver of extinctions—have proliferated in recent decades, as detailed by Elizabeth Kolbert in her important book *The Sixth Extinction*.⁴ Extinctions and population declines sparked by species introductions are contributing at this very moment to the larger phenomenon of animal (species) death recently termed the “Anthropocene defaunation,” which, Rodolfo Dirzo and colleagues argue, “is not only a conspicuous consequence of human impacts on the planet but also a primary driver of global environmental change in its own right.”⁵

2. Critiques of the Anthropocene concept have rightly multiplied in recent years. Following Anna Tsing, Donna Haraway, and others, as I refer to it here the Anthropocene denotes an inflection point or series of inflection points: “What comes after will not be like what came before” (Haraway, *Staying with the Trouble*, 100; Haraway eschews the term *Anthropocene* in favor of what she calls the “Chthulucene”). See also Veland and Lynch, “Scaling the Anthropocene.”

3. Faier and Rofel, “Ethnographies of Encounter,” 364; Barua, “Encounter,” 265.

4. On species introductions and extinction, see also Rose, “Flying Fox.”

5. Dirzo et al., “Defaunation in the Anthropocene,” 401. Defaunation encompasses “the loss of both species and populations of wildlife, as well as local declines in abundance of individuals” (ibid.).

In 1974, Thomas Nagel staged what has since become an iconic multispecies encounter in his essay “What Is It Like to Be a Bat?” I revisit that essay here because its question—can human beings know what it is like to be a bat?—is a timely one: white-nose syndrome, an emerging wildlife disease, has killed more than seven million bats across North America since 2006. Nagel’s argument, that humans cannot know what it is like to be a bat because they cannot experience the world as a bat does, is in some respects hard to dispute: a bat’s capacity for echolocation, for example—as Nagel convincingly argues—makes a bat’s experience of the world hard even to imagine for a human being. Reading Nagel’s essay today thus invites the sorts of questions posed in recent years by scholars in the environmental humanities, including Thom van Dooren and Deborah Bird Rose, regarding the deaths of what Rose and van Dooren call “unloved others.” What does it take, they ask, “to capture human imagination in this perilous era known as the Anthropocene”?⁶ If humans and bats are as alien to one another as Nagel’s essay implies, can human beings come to appreciate the urgent plight of North America’s bats, several species of which face the threat of extinction? On what basis could humans be moved to act on behalf of these bats, and how would they do so if they tried? Such questions are at the heart of multispecies ethics.

An approach to multispecies ethics will be shaped in important ways by its understanding of heterogeneities, or differences-in-kind, such as species differences. The concept of heterogeneity occupies such central concerns as biodiversity (diversity of kinds of life) and human/animal relations: how we understand the nature of differences-in-kind informs our understanding of the limits and possibilities of encounters between species of different kinds; our understanding of what, if anything, distinguishes human animals from other kinds of animal life; and our understanding of the capacities, if any, that exist among human and nonhuman animals for concern and care across species lines.

Take deep ecology, for example.⁷ Some scholars in this tradition have argued that there is no ontological distinction separating the human from other kinds of life and that any *perceived* distinctions are the consequence of Western philosophy’s anthropocentric bias.⁸ Moving beyond that bias, on this account, entails reaching self-realization,

6. Rose and van Dooren, introduction to “Unloved Others,” 1.

7. Deep ecology is a rich tradition with multiple and competing visions of human/nature relations and the ecological (or multispecies) ethics that ought to follow from them, many of which I admire and am inspired by. I bracket these important differences here to illustrate in a general way how understandings of heterogeneity shape approaches to such ethics. This generic description of deep ecology relies on Keller, “Deep Ecology.”

8. I share Val Plumwood’s concern that such resistance to difference may occlude channels of receptivity to “earth others” and can be read to express a demand that what is “other than” conform to one’s own needs and desires, whereas what is needed is a reflective openness to being moved and potentially transformed by what exceeds oneself. “The failure to affirm difference,” Plumwood says, “is characteristic of the colonising self which denies the other through the attempt to incorporate it into the empire of the self, and which is unable to experience sameness without erasing differences” (*Feminism*, 174). Though perhaps it is affinity that is experienced more than sameness.

a state of consciousness in which human beings recognize their identity with the rest of nature and realize that their own interests are equivalent to, or at least indistinguishable from, the interests of the larger whole.⁹ Realizing this equivalence in turn inspires those who have attained self-realization to value all forms of life equally and to thereby contribute to the well-being of the whole. I offer this generic account of deep ecology to illustrate a general point—that the concept of heterogeneity cuts across central concerns in multispecies ethics: the kinds of beings that exist, my relations to them, my capacity to perceive or otherwise apprehend those relations, and how I should respond to their needs and my own.

I concur with deep ecologists and others that Western philosophy's anthropocentric bias functions to anesthetize its adherents to their intimate relations to and entanglements with other kinds of life. The contestable perspective I advance here holds that how we *think* exerts a strong influence on both how and what we *feel* and thus that less anthropocentric understandings of the human and its relations to nonhuman nature have the potential to inspire a more ecological sensibility, one more attentive to and concerned for the welfare of nonhuman others such as bats. To borrow a phrase from Friedrich Nietzsche, "We have to *learn to think differently*—in order at last, perhaps very late on, to attain even more: to *feel differently*."¹⁰ But that is as far as my agreement with deep ecology extends, for its vision of interspecies concern and of the enhanced ecological health that flows from it tends to obscure heterogeneities in order to arrive at its ideal of an undifferentiated and harmonious whole. Where such a vision projects a metaphysical holism and harmonious unity among living things (at least once humans purge themselves of anthropocentrism),¹¹ I follow the lead of thinkers such as Nietzsche and William E. Connolly, among others, who project "a world of becoming replete with loose and partial connections."¹² Where deep ecologists adhere to a cognitivist theory of experience and figure receptivity to entanglements with nonhuman others as a process of "recognition" and "identification," I ascribe to an "immanent naturalist" theory of experience and imagine receptivity to entanglements to be both more embodied and more uncertain.¹³ From this perspective, heterogeneity is a condition of creativity; from

9. I will not address the intrinsic versus instrumental value debate here other than to say that it is not clear to me from what perspective one could project (or "recognize") the intrinsic value of all living things if not from a human perspective, and that every perspective evaluates at least to some degree according to its *needs* (as Friedrich Nietzsche might say). Furthermore, as numerous indigenous knowledges have long maintained, the life/nonlife distinction is in many respects an arbitrary distinction. I restrict my engagement here to human/nonhuman animals on account of their rhetorical value.

10. Nietzsche, *Daybreak*, 103.

11. Deep ecology's metaphysical holism "asserts that the biosphere does not consist of discrete entities but rather internally related individuals that make up an ontologically unbroken whole" (Keller, "Deep Ecology," 207).

12. Connolly, *World of Becoming*, 36.

13. Here is Connolly on immanent naturalism:

By *naturalism* I mean the idea that all human activities function without the aid of a divine or supernatural force. . . . An *immanent naturalist* . . . does not repudiate the transcendental.

time to time, for better or for worse, out of the contrasts within and between things, something *new* emerges.

In part 1 of this essay, I take up the vision of experience Nagel brings to his multi-species encounter: experience, he says, is essentially perspectival and therefore cannot be reduced to objective fact. I suggest that a vision of a unified subject of experience inspires a false sense of estrangement from the events, bodies, and forces on the “outside” of experience, including bats and the white-nose syndrome with which they are afflicted today. I contend that appreciating the heterogeneity of experience may enable us to become more receptive to our entanglements with other species kinds, even if we cannot, strictly speaking, know what it is like to be them. Recent research in the biological sciences showing that the skin of both octopuses and humans responds directly and immediately to fluctuating intensities of light, without the involvement of either eyes or brain, lends support to theories of experience articulated by Nietzsche, Alfred North Whitehead, and other philosophers of becoming. These theories assert that experience extends far beyond what is experienced *consciously* by a subject (whether human or nonhuman). In this view, consciousness is a highly sophisticated yet superficial register of experience—one that depends on, and is partly organized by, multiple heterogeneous forms of experience of lower degrees of complexity throughout an animal body. Attending to the heterogeneity of experience, I suggest, works against the biases of both anthropocentric thinking and conscious perception (especially vision), which tend to exaggerate the distance between “inside” and “outside”; such theories, proposing that regions of our own bodies—parts of us—are more deeply immersed in and immediately involved with the “outside” world in which we participate, may enable us to become more receptive to our entanglements with “unloved others” and perhaps more inclined to intervene on their behalf. They also suggest that there is more to a heterogeneous encounter than what registers of it in conscious awareness.

I explore this latter insight further in part 2, where I turn to Brian Massumi’s logic of “mutual inclusion.”¹⁴ Massumi formulates this logic to unsettle a tacit assumption thanks to which, for example, Nagel can effectively dramatize the irreducibility of subjective experience to objective fact by staging a *multispecies* encounter: the assumption that different kinds of things, such as species kinds, are mutually exclusive.¹⁵ The logic

Rather, it is translated into an immanent field that mixes nature and culture. To immanent naturalism, consciousness emerges as a layer of thinking, feeling, and judgment bound to complex crunching operations that enable and exceed it. The immanent field is efficacious and inscrutable (to some degree), but not immaterial. (*Neuropolitics*, 85, 86)

14. See Massumi, *What Animals Teach Us about Politics*.

15. On my reading, Nagel is at least partly ambivalent about his treatment of species kinds as mutually exclusive. At one point in his essay he comes close to Massumi’s own view of an animal *continuum* and leaves open the possibility that at least some humans could imagine what it is like to be a bat:

It may be easier than I suppose to transcend inter-species barriers with the aid of the imagination. For example, blind people are able to detect objects near them by a form of sonar,

of mutual inclusion refigures species differences by placing both human and nonhuman animals on what Massumi calls an “animal continuum.” This continuum frustrates the anthropocentric tendency to hold humans above the rest of nature thanks to the human’s exemption—whether because of its purportedly unique capacity for consciousness, reason, language, or something else—from the mechanistic causal scheme said to be governing the latter domain. Massumi, too, ascribes to the view that how we think exerts a strong influence on how we experience and intervene in the world. He asserts that anthropocentric thinking, which for him means thinking in terms of things and their attributes, is hostile to the processes of becoming through which the future flows from the past, and hence to life itself.

Yet because Massumi does not identify sources of hostility to life beyond anthropocentric thinking, an approach to multispecies ethics inspired by this logic (to which I turn in the final section) seems to me to risk undermining its noble intention of fostering care among humans for human and nonhuman others. I contend that unless *incompatibilities* within and between things are affirmed as a real force of suffering and destruction in a heterogeneous world, the tendency to focus on the suffering and destruction caused by human activity is liable to slide into a demand that all suffering and destruction be subject to the control of human beings.

Heterogeneities Within and Without

“Anyone who has spent some time in an enclosed space with an excited bat,” urges Nagel, “knows what it is to encounter a fundamentally *alien* form of life.”¹⁶ Nagel’s characterization of the bat in these terms reflects his view that a kind of life (or species) is shaped in important ways by its sensory apparatuses and that its morphology strongly influences the types of activity and varieties of function that can be performed by members of that species. In the multispecies encounter Nagel constructs, differences in species kind function to *estrangle* the participants from one another, inhibiting Nagel’s capacity to understand and relate to the bat with whom he has come face to face: “Bat sonar, though clearly a form of perception, is not similar in its operation to any sense that we possess, and there is no reason to suppose that it is subjectively like anything we can experience or imagine.”¹⁷ Yet differences in *species* kind are of secondary importance here, for Nagel invokes the bat as a means of dramatizing the irreducibility of what he calls “subjective experience” to “objective fact”—of dramatizing, that is, their irreconcilable difference-in-kind.

using vocal clicks or taps of a cane. Perhaps if one knew what that was like, one could by extension imagine roughly what it was like to possess the much more refined sonar of a bat. The distance between oneself and other persons and other species can fall anywhere on a continuum. “What Is It Like to Be a Bat?,” 442n8

16. *Ibid.*, 438.

17. *Ibid.*

Experience, Nagel argues, is essentially perspectival; unlike physical facts, or facts “that can be observed and understood from many points of view,” “the facts of experience—facts about what it is like for the experiencing organism—are accessible only from one point of view.”¹⁸ Why an experiencing *organism*? In addition to being essentially perspectival, experience for Nagel is essentially unified and subjective; experience is the conscious perspective of a subject-organism: “Every subjective phenomenon is essentially connected with a single point of view.”¹⁹ Nagel does not restrict consciousness to human beings—indeed, he suggests that even “simpler organisms” may enjoy some form of it—but he does draw a sharper line between the kinds of things capable of experience (“organisms”) and the kinds that are not (e.g., rocks, rivers, Styrofoam).

Nagel’s ultimate aim in his essay, as I understand it, is to defend experience from the transparency and monotony that physicalists attribute to it. For although Nagel and the physicalists disagree about the relationship between matter and mind—for physicalists, the latter is reducible to the former (at least in principle), while for Nagel it is not—they seem to share a common vision of matter as mechanistic and as knowable through and through. Thus Nagel’s central contention in his essay is not about the bat per se or even about the constraints species differences impose on multispecies encounters; rather, it is what the bat, as “a fundamentally *alien* form of life,” helps us to appreciate: that subjective experiences cannot be reduced to objective facts—facts that, again, because they are physical, are knowable from any perspective.

This image of an objective materiality *opposed* to subjective experience is an image of what could be called, after Whitehead, a “bifurcated nature.”²⁰ Such an image inspires a sense of estrangement both from other experiencing subjects and from the world in which we all participate.²¹ Its adherents are inclined to experience themselves as estranged from the physical world because that world is seen to operate in accordance with a causal scheme that is fundamentally different from the scheme governing the subjective world of experiencing beings: subjects enjoy at least some degree of freedom and self-direction, whereas objective matter blindly obeys mechanistic laws imposed on it from without.²² So one feels estranged from the world because one seems not to *belong* to it: what happens “out there” cannot be accounted for in the terms with which one accounts for one’s own behavior and the behavior of other subjects.

This does not mean, however, that such an image enhances one’s sense of kinship with other subjects, for in this view (of a bifurcated nature) experience is understood

18. *Ibid.*, 442; emphasis in original.

19. *Ibid.*, 437.

20. Whitehead, *The Concept of Nature*.

21. I am still referring here to Nagel’s understanding of experience, namely, as something of which organisms of sufficient complexity are capable. Although I engage both Whitehead and Nietzsche in this essay, philosophers who are often read as *panexperientialists*, I do not address the issue of panexperientialism in this essay.

22. Within this image, in Whitehead’s words, “a scientific realism, based on mechanism, is conjoined with an unwavering belief in the world of men and of the higher animals as being composed of self-determining organisms” (*Science and the Modern World*, 76).

narrowly as the conscious experience of a unified and self-contained subject, one who directs the “objective” materiality of its body from within. Reducing experience to consciousness inclines us to attend only to the most superficial of our relations to the events, bodies, and forces “outside” our experience: the relations discernible in conscious perception. Vision, in particular, exaggerates our independence from others by figuring our relations to them geometrically across space and time, reinforcing the idea of ourselves as self-contained and closed off from one another. Sense perception, Whitehead remarks, “is a sophisticated derivative from the more primitive bodily experience”—that is, our feelings “of our essential connection with the world without, and also our own existence now.”²³ Whitehead continues: “Sense perception is the triumph of abstraction in animal experience. Such abstraction arises from the growth of selective emphasis. It endows human life with three gifts, namely, an approach to accuracy, a sense of the qualitative differentiation of external activities, a neglect of essential connections.”²⁴ Remaining mindful of the fact that the sophistication of conscious sense perception can divert attention from our more intimate and vital relations to others may work against the tendency to treat what is presented in conscious perception as exhaustive of what is and of our relations to it.

Adopting a more capacious vision of experience, in which not one but multiple registers of experience come together to compose the conscious “I,” may have a similar effect. “To make one perspective in seeing into *the cause of seeing as such*: that was the clever feat in the invention of the ‘subject,’ of the ‘I!’”²⁵ When Nietzsche describes the subject as invented, he is not denying that it is real; he is, rather, pointing to its *historicity* and hinting at another way we might imagine the relationship between the body and the experiencing “I.” In contrast to the view that “the self’s identity can be reduced to consciousness and that mind directs the body,” Rosalyn Diprose explains that for Nietzsche, “the *body* is what compares and creates and that thought and the ego are its instruments.”²⁶ Here, materiality—the stuff of our bodies and of the Earth—is not merely awaiting instructions from without but is lively and inventive in its own right. The materialities of our bodies harbor experiences of their own, which, although inaccessible to conscious experience, nevertheless help to compose it.

To pursue this vision of experience, in which consciousness is but the most sophisticated, and therefore superficial, “grade” of experience in an animal body, I turn next to recent research in the biological sciences. These studies seem to me to illustrate the Nietzschean notion of a “subject as multiplicity”—of a self composed of multiple zones of experience subsisting outside, even as they organize to enable, the subject of

23. Whitehead, *Modes of Thought*, 73, 72.

24. *Ibid.*, 73.

25. Nietzsche, *Writings from the Late Notebooks*, 96–97.

26. Diprose, “Nietzsche and the Pathos of Distance,” 3; emphasis added. The earlier quote from Nietzsche regarding the power of conscious thought to transform (if indirectly) how we feel-evaluate the world suggests to me that for Nietzsche consciousness cannot be reduced to a mere instrument of the body.

conscious experience. As I interpret it, the evidence presented by this research suggests the need for a more capacious vision of experience; experience now extends throughout an animal body and assumes a multiplicity of both forms and grades—it appears, that is, *heterogeneous*. Let us begin with the octopus.

The octopus is a master of disguise. Considering the extraordinary range of not just colors but textures that octopus bodies can assume, it may seem odd that, as far as scientists can tell, octopus camouflage operates through vision alone.²⁷ The process appears even more mysterious considering the swiftness with which it unfolds, given that cortical visual processing tends to be among the slowest processes of thought-perception in animals with sophisticated brain-body networks. Yet a recent study suggests that octopus eye-sight does not exhaust the animals' capacities for visual perception: the skin of the California two-spot octopus (hereafter "two-spot") responds to fluctuating intensities of light without any input from its eyes.²⁸ This is possible, researchers believe, thanks to the presence of opsins in the animal's skin, light-sensitive proteins involved in vision and long believed to inhabit its eyes alone. The study finds "dispersed, dermal light sensitivity" across the two-spot's body, meaning that the animal's capacities to sense changing intensities of light are not restricted to its eyes, brain, and central nervous system but rather are dispersed—its higher-grade sense organs are supplemented by less precise capacities for receptivity and responsiveness in its skin, capacities enabling "a *direct response*" by the two-spot's skin to contrasts in light.²⁹ With the aid of these opsins, then, octopus skin appears to exert an agency of its own; it bypasses the animal's brain to respond directly to contrasts in light, initiating a process of outward transformation without consulting the "agent" of the central nervous system.³⁰

In recent years, research in human biology has found evidence of a similar phenomenon among human beings: human skin "is able to 'sense' ultraviolet light in the same way as [human] eyes because skin cells contain rhodopsin, the same photosensitive receptor that the eye uses to detect light."³¹ Because this receptor is also involved in the skin's "melanin-producing defense against DNA damage," researchers have concluded that "as soon as you step out into the sun, your skin knows that it is exposed to UV radiation."³² Indeed, researchers now believe that for a wide range of species,

27. Even the "physical three-dimensional effects" achieved in cephalopod camouflage are "regulated by visual input" (Hanlon, "Cephalopod Dynamic Camouflage," 400).

28. See Cohen, "Seeing without Eyes."

29. Ramirez and Oakley, "Eye-Independent, Light-Activated Chromatophore Expansion," 1514; emphasis added. See also Cohen, "Seeing without Eyes," for a discussion of the crude quality of the skin's receptivity relative to that of the eyes.

30. The researchers speculate that what they call LACE, or light-activated chromatophore expansion, "may play a role in modulating body patterning for camouflage, alongside the canonical control exerted by the CNS [central nervous system]" (Ramirez and Oakley, "Eye-Independent, Light-Activated Chromatophore Expansion," 1516).

31. Paddock, "Skin Senses Light."

32. *Ibid.*; emphasis added.

“photoreceptors can be found throughout animals’ bodies,” where they “regulate light-mediated behavior that exists below the level of consciousness and that doesn’t require having an extremely precise knowledge of a light source’s location in space or time.” Such behaviors include “the timing of daily cycles of alertness, sleep and wake, mood, body temperature and numerous other internal cycles that are synchronized to the changes of night and day.”³³

These partly autonomous zones of experience, with their own capacities for receptivity and responsiveness, suggest that there is more to experience than what is experienced of it by the conscious subject. These studies confront us not only with a unified subject of consciousness but also with dispersed microsites of experience below the register of conscious awareness, where micro “agents” contribute to and help to compose the qualitative experience of the larger being. So consciousness, on this account, no longer appears as the sole domain of experience but is seen to emerge from the complex interactions and interinvolvements of a heterogeneous array of microexperiences inaccessible to consciousness but on which it depends for its possibility. I imagine these semiautonomous zones, laced with processes of receiving and responding to influences from without, as ecotones of experience, “transitional area[s] between two or more distinct ecological communities” in which the self shades off, like an ombré, into the wider world beyond.³⁴ Within ecotones of experience, the boundary separating self from world is especially porous and vague (though that boundary is tricky to draw no matter where we try it). Ecotones of experience can be understood as more *public* sides of ourselves, participating both directly and immediately in events on the outside of (conscious) experience, unbeknownst to “us.”

Attending to the heterogeneity of experience thus alerts us to more public dimensions of our being and may thereby work against the tendencies of both anthropocentric thinking and sense perception to play up the foreignness of the larger world beyond and the other beings who inhabit it. This in turn has the potential to heighten our receptivity to our entanglements with these others and to perhaps inspire a heightened sense of urgency regarding their welfare. Feeling slightly less at home in ourselves, then, may enhance our feeling of responsibility to care for the home we share with others.

Heterogeneities on the Move

Deep ecology, as we saw above, regards what I have been calling anthropocentric thinking as a central force of ecological destruction and seeks to promote a more ecological understanding of the human and its place in nature to work against that destruction. Instead of a human-centered perspective on existence, in which “humans are [thought to be] above, superior to or outside the rest of Nature,” a number of deep ecologists

33. Cronin, “Seeing without Eyes.”

34. *Oxford English Dictionary Online* (June 2017), s.v. “ecotone, n.,” www.oed.com/view/Entry/59403. Cf. Whitehead’s discussion of “mutual expression” in *Modes of Thought*, 72.

have called on their readers to appreciate that “ontological boundaries between living beings are . . . illusory”—that “there are no boundaries and everything is interrelated.”³⁵ Once this interrelatedness is “recognized,” the thinking goes, ecologically ethical comportment follows, since “if we harm the rest of Nature then we are harming ourselves.”³⁶ Thus heterogeneities, while “illusory,” are nevertheless real obstacles to the kinds of thinking and doing that deep ecologists associate with the flourishing of the self, the other, and their common world.

While I do not agree with deep ecologists that affirming the heterogeneities we encounter in experience as real entails anthropocentric thinking, it seems to me that certain ways of figuring that reality are more apt to promote anthropocentrism than others. In Nagel’s case, for example, an image of objective matter opposed to subjective experience figures materiality as inert and mechanistic and therefore susceptible to mastery by human beings (and subjects of other species kinds). Further, the sense of estrangement inspired by such a bifurcated image may lend support to the idea of “apartness” at the heart of anthropocentrism (among other -isms). Thus rethinking the heterogeneity of matter and mind in less binary terms—as grades, for example—may contribute to contemporary efforts in the environmental humanities and elsewhere to cultivate a sense of implication or entanglement with others.³⁷ In this section I turn to process philosophy to propose a more robust account of the effectivity of heterogeneous encounters. I attempt to elaborate more fully an insight that emerged from my engagement with Nagel: that the effects of a heterogeneous encounter may exceed what registers of those effects in conscious awareness. In Nagel’s human-bat encounter, differences in species kind function to depotentialize the encounter—to foreclose the sorts of meaningful exchange that would have been open to the participants had they belonged to the same species. Today, as unusual encounters continue to proliferate, might a greater emphasis on the activities and capacities particular to species kinds augment our sense of the transformative potential of such encounters?

In process philosophy, becoming is granted priority over being; while process philosophers generally do not deny the existence of “things” (subjects, objects, structures, etc.), they attach greater significance to the processes out of which things emerge and through which they endure.³⁸ Process thinkers break with the “substance metaphysics” dominating Western philosophy since Aristotle; if substance-based approaches are concerned above all with “*what there is*,” process stresses “*what is occurring* as well as *ways of occurring*.”³⁹ Thus in process thought, reality is best understood in terms of modes of

35. Deval and Sessions, *Deep Ecology*, 43; Keller, “Deep Ecology,” 207; Deval and Sessions, *Deep Ecology*, 68.

36. Deval and Sessions, *Deep Ecology*, 68.

37. Neither *implication* nor *entanglement*, as I employ them, entails “oneness.”

38. In this essay I use “process philosophy” and “philosophies of becoming” interchangeably.

39. Seibt, “Process Philosophy,” n.p.; emphasis in original. As Johanna Seibt explains, substance metaphysics holds that “the primary units of reality (called ‘substances’) must be static—they must be what they are at any instant in time” (ibid.).

change; “change of every sort—physical, organic, psychological—is the pervasive and dominant feature of the real.”⁴⁰

A process orientation to heterogeneities seeks to account for their creative potential—for the fact that, occasionally, out of the contrasts within and between things, something new comes into being. Symbiogenesis is exemplary here:

Symbiogenesis, an evolutionary term, refers to the appearance in . . . symbiotic partners of *new behaviors, new metabolism, new tissues, new organs or organelles, and new gene products, etc.* . . . The classical example of symbiosis is between fungi and algae or, alternatively, fungi and cyanobacteria. The rock-clinging abilities of fungi, combined with the light-using abilities of photosynthetic organisms, *hone these organisms into a new unit*—lichens—with combined capacities to take energy from the environment, turn it into the stuff of life, and degrade ambient gradients. . . . Lichens are not plants but symbiotic organisms, which are part fungi.⁴¹

A “substance” orientation to heterogeneities will have a harder time accounting for such novelty, since from this perspective the categories “fungi” and “algae” are said to exclude one another—one cannot belong to both. This approach to identity and difference was of course common among early taxonomists; witness their bemused, irritated, and even suspicious reactions to the “paradoxical” platypus, a creature with “fur, duck bill, and webbed feet” that “laid eggs and suckled its young.”⁴² As one commentator notes, “It was axiomatic [among European taxonomists at the time] that all milk-producing animals give birth to live young, and so, by definition, are mammals. Warm-blooded egg-laying animals were birds. Cold-blooded egg-laying animals were reptiles. There was no place in this scheme for the platypus” (fig. 2). So strong was their sense that an animal must be *either* mammal *or* reptile that a number of the taxonomists deemed the specimen before them a “hoax”: “the bill of a duck attached to the skin of a mole.”⁴³ To account for the creativity of heterogeneous encounters, including those out of which the platypus evolved, process philosopher Massumi has argued that it is necessary to overcome this “all-too-human logic of the one *or* the other.”⁴⁴ Massumi formulates a new logic, that of mutual inclusion, to make room for the one *and* the other.

The logic of mutual inclusion would not deny that the platypus is paradoxical; rather, it would urge the irritated taxonomists to rethink paradox. This logic sets heterogeneities in motion—it seeks to understand heterogeneities less for what they are at any given moment than for what they can do. To bring out and play up an animal’s capacities—the kinds of things the animal can do—as well as the styles and logics

40. Rescher, *Process Metaphysics*, 7.

41. Margulis and Sagan, “Role of Symbiogenesis in Evolution,” 178, 179; emphasis added.

42. Hall, “Paradoxical Platypus,” 212.

43. *Ibid.* Hall does note, however, that such hoaxes were not uncommon at the time.

44. Massumi, *What Animals Teach Us*, 67.



THE DUCK-BILLED PLATYPUS (ORNITHORHYNCHUS PARADOXUS).

Figure 2. An 1853 engraving of a platypus. Courtesy of the *Illustrated Magazine of Art*

according to which the animal performs the activities particular to it, Massumi treats what I have been calling heterogeneities as “modes of activity” or “tendencies.” Tendencies, he says, “can combine forces without mutually excluding each other”; tendencies “resonate or interfere with each other, stunt or prolong each other, sap or boost each other, capture each other or enter into mutually beneficial symbiosis.”⁴⁵

To approach, say, a fungus and an alga as individual members or representatives of a larger group defined by “certain common structural characteristics distinct from those of any other group” is to privilege the identity of that group at a particular moment over the transformational encounters through which its “structural characteristics” emerged and, more important, its capacities for further transformation both now and in the future.⁴⁶ On the other hand, when approaching their encounter as an encounter of tendencies, because the focus is already on capacities and activities (rather than characteristics), it is easier to make sense of the productivity of a heterogeneous encounter: “The rock-clinging *abilities* of fungi, combined with the light-using *abilities* of photosynthetic organisms, hone these organisms into a new unit—lichens—with *combined capacities*.”⁴⁷ The paradox of the platypus (and the lichen) is what Massumi calls a productive paradox, a heterogeneous encounter out of which something new comes to be.

45. *Ibid.*, 46.

46. *Oxford English Dictionary Online* (June 2017), s.v. “genus, n.,” www.oed.com/view/Entry/77719.

47. Margulis and Sagan, “Role of Symbiogenesis in Evolution,” 178; emphasis added.

In a productive paradox, “the differences in play are not reducible to oppositions”; rather, the paradox stages “a creative zone of indiscernibility in which differences co-occur without coalescing, enactively fuse without becoming confused, in a dynamic proximity catapulting life into a transindividual movement of surpassing the given in the direction of the new.”⁴⁸ Let me try to explain. In the play of productive paradox, the heterogeneities or tendencies brought together not only fail to exclude each other but actively enter into each other in the sense that, having come face-to-face, each exerts an influence on the other. This mutual influencing is what Massumi calls the “included middle” or “zone of indiscernibility” between them.⁴⁹ His idea is that one receives such influence as enrichment—as an added capacity, a new power for action in the future. Further, as we saw in the context of evolution, sometimes this zone of mutual influencing takes on, or rather gives birth to, a life of its own: the lichen/platypus. So approaching heterogeneities as tendencies allows us to better account for the creative potential of heterogeneous encounters—for the productivity of paradox.

In part 3 of this essay I explore Massumi’s approach to heterogeneities as tendencies in greater detail and consider why he calls the logic of mutual exclusion—of the one or the other—an “all-too-human logic” hostile to life’s creative transformations. For now I would like to highlight the usefulness of the logic of mutual inclusion to account for life’s own hostilities, something Massumi’s focus on novelty and productivity tends, in my view, to obscure. The explanatory power of the included middle (zone of indiscernibility) is not restricted, as I understand it, to the creative potential of heterogeneous encounters; it is adept at capturing the destructive potential of such encounters as well. To illustrate this, I turn next to white-nose syndrome, a “catastrophic example” of the emerging fungal wildlife diseases “on the rise worldwide.”⁵⁰ In white-nose syndrome, a zone of indiscernibility between the little brown bat, *Myotis lucifugus* (hereafter “Little Brown”), and a fungal pathogen, *Pseudogymnoascus destructans*, leverages the capacities of both to spread the fungus to caves across North America, decimating bat populations as it goes.

Bats are a highly diverse species-being.⁵¹ In fact, *Chiroptera* accounted for nearly one-fifth of all mammal species in 2005.⁵² Shortly thereafter, however, researchers stumbled upon piles of bats afflicted with what they would come to call white-nose syndrome, “one of the most devastating wildlife epidemics in recorded history,” which has killed millions of bats across North America and brought several species to the edge of extinction.⁵³ This emerging wildlife disease got its start in an unusual encounter between Little Brown and *Pseudogymnoascus destructans*, a newly documented species of

48. Massumi, *What Animals Teach Us*, 68, 67.

49. Massumi, *What Animals Teach Us*.

50. Trivedi et al., “Fungus Causing White-Nose Syndrome in Bats,” 1.

51. Technically, *Chiroptera* is an “order” rather than a “species.”

52. Simmons, “Order Chiroptera.”

53. Trivedi et al., “Fungus Causing White-Nose Syndrome in Bats,” 1.

fungus.⁵⁴ Like the unusual encounters opening this essay, the confrontation of *M. lucifugus* and *P. destructans* is an encounter of formerly unacquainted assemblages.⁵⁵

P.d does not waste any time; its incursions into bat caves are swift and unforgiving, and once inside a hibernaculum, the fungus can trigger what is known as a mass mortality event, extirpating the local bat populations settled in for winter. It moves so fast by exploiting bats' social behavior—their tendency to huddle together as they take refuge from the harsh winter—and it spreads so widely by cajoling Little Brown to take it for a ride: *P. destructans* propagates by hitchhiking to new caves, where it can spread some more.

The relations of Little Brown and *P.d* are often figured as a “host-pathogen relationship.” But to talk in terms of Little Brown (host), on one hand, and *P.d* (pathogen) on the other and of a relationship in between is to wrestle with terms too blunt to trace their complex interactions and interinvolvements. Such interactions and interinvolvements can be traced only when Little Brown and *P.d* are seen to partly *infuse* one another—to come together in such a way as to make it difficult to tell them apart, even as they never lose their distinction altogether.

The encounter of *P.d* and Little Brown features Massumi's included middle or zone of indiscernibility. Early on, before *P.d* has had a chance to manifest, Little Brown, who is hibernating, is already burning substantially more fat than the typical (uninfected) *M. lucifugus*.⁵⁶ Who is driving this energy binge, and toward what ends? Is *P.d* siphoning Little Brown's energy for its own use? Is Little Brown waging war against the intruder? Unclear. A little while later, once *P.d* has had some time to settle in, Little Brown will rouse from its sleep with unusual frequency, even embarking on daytime flights in the middle of winter. Here again, it is difficult to parse host from pathogen: are Little Brown's mid-day excursions bids to expel *P.d* by exposing it to sunlight? Has the fungus hijacked Little Brown's sensory-motor controls in a scheme to spread its spores beyond the walls of this cave? Hard to say. Returning to Massumi's logic of mutual inclusion, which seeks to account for “that which interpenetrates without losing its distinction,” *P.d* and Little Brown are partially infused into one another yet remain irreducible to the other (that one cannot say who is doing what means that there is still more than one who).⁵⁷

54. White-nose syndrome threatens many bat species on the continent. I focus here on the little brown bat because it is the species believed to be at greatest risk of extinction.

55. Biologists and others studying white-nose syndrome have speculated but not confirmed (as far as I know) that this encounter between *P. destructans* and North American bats was a species introduction and thus tied to human activity. Importantly, this engagement with white-nose syndrome is not motivated by the concerns of biological nativism. I use *unusual* here, instead of *alien* or *exotic*, to avoid the xenophobic connotations of the latter terms. Furthermore, I share Harriet Ritvo's view that “the critique implicit in the term [*invasive species*] ahistorically assumes the previous existence of a static biota without intruders, in which relations among the constituent species were balanced, if not harmonious” (“Invasion/Invasive,” 173).

56. Royal Veterinary College, “European Origins for Fungus Killing Millions of North America's Bats,” Press Office, March 16, 2015, www.rvc.ac.uk/news-and-events/press-office/european-origins-for-fungus-killing-millions-of-north-american-bats.

57. Massumi, *What Animals Teach Us*, 49.

While this fungus-bat encounter seems to me to be better figured as destructive than as productive, focusing on the encounter's included middle does call attention to its effectivity, to what the encounter *does*, for better or for worse.

A process approach to heterogeneities, which seeks to emphasize the activities and capacities performed by different kinds of things, not only their distinctive "attributes," may thus encourage a more capacious sense of the possibilities and risks presented by unusual encounters such as white-nose syndrome. It might encourage us to ask, for example, whether the activities and capacities usually performed by seals, sea lions, and polar bears have been frustrated, overwhelmed, or undermined and what that might mean for our own capacities to do and to become on the rapidly changing planet we inhabit together.

Heterogeneities in an Age of Extinction—Multispecies Ethics

Earlier I suggested that the concept of heterogeneity occupies central concerns within multispecies ethics—the kinds of beings that exist, the nature of the relations within and between them, their capacities to perceive or otherwise apprehend those relations, and their potential, if any, for care and concern across species lines. Perceived differences in kind pose a danger on the deep ecology view because they authorize differential (more specifically, hierarchical) valuations: deep ecology holds that ecological well-being entails the ideal of harmony and that harmony requires that humans "recognize" that all living things possess equal value, themselves included—that they adopt, that is, a *biocentric* (as opposed to *anthropocentric*) ethics. Such an ethics, if adopted by enough of us, should, on this account, restore the ecological harmony lost with the onset of anthropocentric thinking-perceiving.

I have relied on deep ecology in this essay as a contrast against which to engage two thinkers who affirm heterogeneity, if in importantly different ways, and to promote an approach to heterogeneities as graduated contrasts within and between things. I turned first to Nagel's iconic multispecies encounter between human and bat. Nagel was not concerned with multispecies ethics in his essay, but I tried to show that a view of human and bat as "fundamentally *alien*" to one another is connected to the idea that subjective experience is opposed to objective fact. I proposed that appreciating multiple grades of experience both multiplies and softens the contrasts between matter and mind, and between self and world (and the other selves who inhabit it). Attending to such heterogeneities, I argued, alerts us to more public dimensions of ourselves, which we can understand as ecotones of experience: transitional zones between inside and outside, where "I" shades off into the wider world beyond (and it shades off into "me"). But rather than reduce or diminish conscious experience to "objective fact," this discussion, I hope, inspires an appreciation for the wondrous complexity and even ingenuity of the experiential processes on which higher-level conscious experience depends. Moreover, while these more vital and public registers of experience are not directly accessible to conscious experience, remaining mindful of them, I suggested, may make

us more receptive to our entanglements with the events, bodies, and forces we experience as being outside ourselves.

I turned to process philosophy to illustrate how a vision of heterogeneities as graduated contrasts within and between things can account for their creative potential when heterogeneities are set into motion—when we attend to things not just for what they are but also for what they can do and become—for the activities particular to them, their capacities to do and to become. I engaged Massumi’s logic of mutual inclusion to illustrate that an emphasis on activities and capacities (over characteristics) is better able to explain the effectivity of unusual encounters such as those that would ultimately spawn the lichen and the paradoxical platypus but also those currently wreaking havoc within communities of bats across North America. Here I would like to raise the possibility that taken too far, a move away from things toward tendencies risks obscuring real incompatibilities between activities of different kinds, such as the asexual reproduction of *Pseudogymnoascus destructans* and the survival of little brown bats. My suggestion is that retaining a supple notion of “things” is more apt to sustain the ethical responsiveness so urgently needed today.⁵⁸

Massumi’s philosophy not only affirms heterogeneities but seeks to promote them: the more differences the better. This accords with his view that life, broadly construed, grows both more heterogeneous and more complex over time. What ensures in such a world that all these differences will get along? Recall that for Massumi heterogeneities are best understood as tendencies, and that tendencies “can combine forces without mutually excluding each other.”⁵⁹ Formal logic’s principle of the excluded middle—what Massumi referred to as the “all-too-human logic of the one or the other”—is “hostile” to life, he says, because it resents, and consequently attempts to avoid or deny, life’s processual character: “The world is in point of processual fact, populated by events

58. Perhaps this point shares something with Plumwood’s suggestion that an ecological ethics, if it is to overcome what she calls “the dualistic dynamic,” must recognize “both continuity and difference” (*Feminism*, 5). Plumwood argues that rejecting “the western construction of nature as an inferior sphere of exclusion” does not entail “agreeing to abandon oneself to necessity, to accept anything which may happen without resistance.” “We do not have to assume,” she continues, “that nature is a sphere of harmony and peace, with which we as humans will never be in conflict” (37).

59. As we saw, Massumi does not deny that tendencies can work against each other, exploit each other, or even snuff each other out. Yet because, when they do appear in his work, forces of depletion, destruction, and preemption (as the foreclosing of emerging novelty in advance) appear most often as *human* forces, the general impression one gets in reading Massumi is that a human, all-too-human, resentment of becoming is the dominant force of destruction on Earth. (Perhaps there is some truth to this today, but the history of mass extinction events before humans’ arrival on the scene suggests that humans, or their all-too-human resentment of becoming, are not needed to have large-scale destruction and death.) For example, Massumi’s work on preemption, which brilliantly diagnoses what he calls the “politics of preemption” and the unjust oppression, suffering, and death such a politics entails, does not offer an affirmative account of preemption, as far as I can tell. However, there are real dangers—at least some of which cannot be reduced to human malfeasance—and thus a positive role for preemption seems important in any politics today, even as it may risk unwittingly introducing real dangers of its own. See Massumi, *Ontopower*.

more so than things. The world is made of verbs and adverbs more primordially than nouns and adjectives.”⁶⁰ Thus a logic concerned with things—objects, subjects, structures, and so on—and their attributes is not only out of touch with the rest of life on this account but also hostile to it.

Interestingly, Massumi turns to Nietzsche to promote a concept of a “subjectivity without a subject,” a *doing* without a *doer*. He invokes Nietzsche’s discussion of lightning, in which Nietzsche argues that it is an error to separate “the lightning from its flash” and to then take “the latter for an action, for the operation of a subject called lightning.”⁶¹ Tendency, here as subjectivity-without-a-subject, is best understood not as a driver, willer, or effector but as “a ‘driving, willing, effecting’ with nothing behind it but its own forward momentum.”⁶² So to figure heterogeneities as tendencies is to think in a manner both more in touch with the rest of life and more affirmative of life’s processual character. For Massumi, it seems that a move away from things toward tendencies is thus not only a more accurate way of understanding heterogeneities but a more ethical way as well: no longer hostile to differences for their transformative potential, such thinking participates as a tendency among other tendencies, “self-driving toward ever more inclusive immanent excess.”⁶³

I say that the turn to Nietzsche to advance this perspective is interesting because Nietzsche seems to me to argue that while it may be an error to project a *doer* behind a deed or to abstract a being from a process of becoming, it is nevertheless a *useful* error—indeed, it is an error without which we could not think or even live. Nietzsche also contends that human beings are not the only ones to commit such errors of thought: even the lowly amoeba simplifies and equalizes—treats as equal what is merely similar—and indeed *must* simplify and equalize if it is to survive. The central insight I wish to take from Nietzsche here is that a way of thinking—in our case, a way of figuring heterogeneities—can be evaluated not only for its “truth value” but also for the way of experiencing and acting that it tends to promote among its adherents.

Writing in a different context, William Cronon once argued that a sound environmental ethic must heed the “unassailable evidence that many of the environmental changes we now face also occurred quite apart from human intervention at one time or another in the earth’s past.”⁶⁴ He raised this point not because he believed “that our current problems are trivial, or that our devastating effects on the earth’s ecosystems should be accepted as inevitable or ‘natural’” but rather because the tendency to avoid or deny the real forces of ecological destruction beyond the grasp of human beings is likely to demand that humans be able to control—even if only through their *inaction*—

60. Massumi, *What Animals Teach Us*, 40.

61. Nietzsche, *On the Genealogy of Morals*, 481.

62. Massumi, *What Animals Teach Us*, 107n40 (quoting Nietzsche, *On the Genealogy of Morals*).

63. *Ibid.*, 43. See Massumi’s discussion of “animal politics” and his “ethico-aesthetic paradigm” for more on this, both in the appendices of *What Animals Teach Us about Politics*.

64. Cronon, “Trouble with Wilderness,” 19.

ecological destruction as such. And this would distract, he thought, from the urgent need to address the troubles we *are* contributing to today. “We seem unlikely,” Cronon continued, “to make much progress in solving these problems if we hold up to ourselves as the mirror of nature a wilderness we ourselves cannot inhabit.”⁶⁵ The “wilderness” I have in mind here is the wilderness of a world of pure process, a world we (inheritors of subject-predicate thinking) are unlikely to feel a part of, given our long history of thinking in terms of things. So while it seems unlikely that we could ever really know what it is like to be a bat, and while it is probably true, at least in certain respects, that a “bat”—as an abstraction from processes of becoming—is a fiction, asking what it is like to become a bat today, when the precariousness of being is so intense, may serve to remind us of all the *things* that remain and are worth fighting for.

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65. *Ibid.*

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