CULTURAL ANTHROPOLOGY

THE EMERGENCE OF MULTISPECIES ETHNOGRAPHY

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A new genre of writing and mode of research has arrived on the anthropological stage: multispecies ethnography. Creatures previously appearing on the margins of anthropology—as part of the landscape, as food for humans, as symbols—have been pressed into the foreground in recent ethnographies. Animals, plants, fungi, and microbes once confined in anthropological accounts to the realm of *zoe* or "bare life"—that which is killable—have started to appear alongside humans in the realm of *bios,* with legibly biographical and political lives (cf. Agamben 1998). Amid apocalyptic tales about environmental destruction (Harding 2010), anthropologists are beginning to find modest examples of biocultural hope—writing of insect love (Raffles 2010), of delectable mushrooms that flourish in the aftermath of ecological destruction (Tsing, for the Matsutake Worlds Research Group 2009), and of microbial cultures enlivening the politics and value of food (Paxson 2008).

Multispecies ethnographers are studying the host of organisms whose lives and deaths are linked to human social worlds. A project allied with Eduardo Kohn's "anthropology of life"—"an anthropology that is not just confined to the human but is concerned with the effects of our entanglements with other kinds of living selves" (2007:4)—multispecies ethnography centers on how a multitude of organisms' livelihoods shape and are shaped by political, economic, and cultural forces. Such ethnography also follows Susan Leigh Star, who suggests "it is both more analytically

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interesting and more politically just to begin with the question, *cui bono?* than to begin with a celebration of the fact of human/non-human mingling" (1991:43).

The adjective "multispecies" already travels in biological and ecological research worlds, referring to patterns of multispecies grazing, the coconstruction of niches, and wildlife management (e.g., de Ruiter et al. 2005). What can it do—what is it doing—in anthropology? Essays in this issue of *Cultural Anthropology* offer some answers. The present essay locates the discussion within contemporary debates about the "human"; in the history of anthropologies of animals, plants, and other organisms; and with respect to conceptual questions about the definition of "culture" and "species."

"Becomings"—new kinds of relations emerging from nonhierarchical alliances, symbiotic attachments, and the mingling of creative agents (cf. Deleuze and Guattari 1987:241–242)—abound in this chronicle of the emergence of multispecies ethnography, and in the essays in this collection. "The idea of *becoming* transforms types into events, objects into actions," writes contributor Celia Lowe (this issue). The work of Donna Haraway provides one key starting point for the "species turn" in anthropology: "If we appreciate the foolishness of human exceptionalism," she writes in *When Species Meet,* "then we know that becoming is always becoming *with*—in a contact zone where the outcome, where who is in the world, is at stake" (2008:244). Departing from Deleuze and Guattari, whose ideas about "becoming animal" Haraway has critiqued for misogyny, fear of aging, and an incuriosity about actual animals (2008:28–30), multispecies ethnographers are studying contact zones where lines separating nature from culture have broken down, where encounters between *Homo sapiens* and other beings generate mutual ecologies and coproduced niches (Fuentes this issue).

Multispecies ethnography has emerged with the activity of a *swarm,* a network with no center to dictate order, populated by "a multitude of different creative agents" (Hardt and Negri 2004:92). The Multispecies Salon—a series of panels, round tables, and events in art galleries held at the Annual Meetings of the American Anthropological Association (in 2006, 2008, and 2010)—was one place, among many others, where this swarm alighted. The salon became a "para-site" (Marcus 2000)—a paraethnographic field site where anthropologists and their interlocutors came together to discuss matters of common concern (see Figure 1, a poster for the 2008 event).[1] Art served as a companion and catalyst practice for thinking through and against nature–culture dichotomies (see also Kac 2007; da Costa and Philip 2008).[2] In this essay, we interweave an introduction of essays in this issue

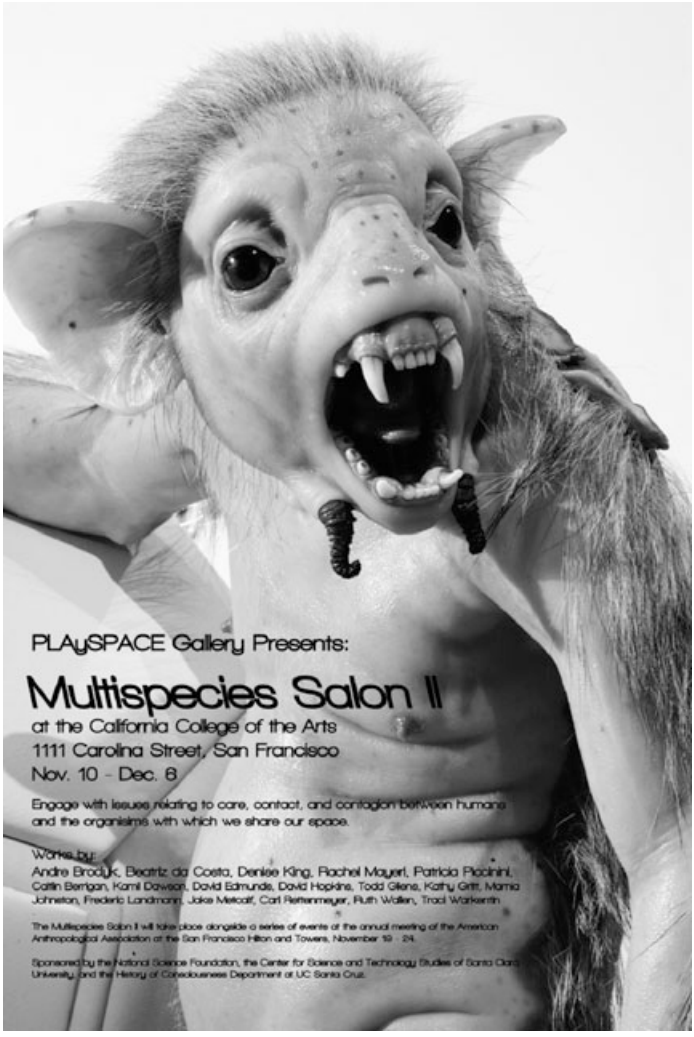

FIGURE 1. "The Bodyguard for the Golden Helmeted Honeyeater." The bodyguard, a poster child for the Multispecies Salon, is a lively fiction made out of silicone by Australian sculptor Patricia Piccinini. This fantastic creature was invented to protect a real organism—the golden helmeted honeyeater, a small colorful bird of Victoria, Australia, whose breeding population consists of just 15 pairs. Piccinini describes this creature as "genetically engineered" with large teeth that have a dual function: "He will protect [the honeyeater] from exotic predators, and he has powerful jaws that allow him to bite into trees, to provide the birds with sap" (2004). These teeth are also a reminder that animals are not just good to think with, or play with, but that they might bite. This potentially dangerous humanoid figure illustrates the lively potentials and deadly consequences, the high stakes in the mix, when species meet. Donna Haraway, who presented a paper about Piccinini at the Multispecies Salon in 2008, suggests that her sculptures are "unsettling but oddly familiar critters who turn out to be simultaneously near kin and alien colonists" (2007). Piccinini's art mixes science fiction and fact, illuminating actual naturalcultural problems in Australia as well as possible solutions. Moving past the "soporific seductions of a return to Eden [and] the palpitating frisson of a jeremiad warning of the coming technological Apocalypse" (Haraway 2007), Piccinini's work embodies a mandate to protect endangered organisms, while offering an opportunity for reflecting on the ambivalent nature of the technoscientific interventions that have been mobilized to save them.

of *Cultural Anthropology* with a theoretical discussion and with gleanings from this para-site.

WRITING CULTURE IN THE ANTHROPOCENE

Anthropos—the ethical and reasoning being that Enlightenment Europeans conjured as their inheritance from classical Greece (Herzfeld 2002)—has been the subject of renewed attention among anthropologists. In its classical articulation, Michael M. J. Fischer reminds us, *anthropos* was an entity sited between the divine and bestial, a being that self-reflexively fashioned itself as a member of the polis (2009:xv–xvi). After Foucault, *anthropos* has also become a figure fashioned by the modern sciences of life, labor, and language—that is, by biology, political economy, and linguistics (see Rabinow 2003, 2008). And in the contemporary moment, what counts as living, working, and communicating are under radical revision in the biosciences.[3] In this context, anthropologists have begun to ask: What is anthropos becoming?

Attention to anthropos has generated more instability in conceptions of "ethics" and "culture" than it has directed attention to anything like a changing organic "human nature."[4] Such a displacement of foundational discourse about biology indexes a conviction among many cultural anthropologists that anthropology has outgrown its U.S. four-field form (cultural, biological, linguistic, and archaeological) and that the sciences of human biology have little to say to cultural analysis. Dan Segal and Sylvia Yanagisako's 2005 collection, *Unwrapping the Sacred Bundle: Reflections on the Disciplining of Anthropology,* is just one text calling for cultural anthropologists to unbind themselves from the objects and epistemologies of biological anthropology. That text can also be read as an echo of the 1990s "science wars"—debates about what mix of empiricism and interpretation ought ground positive knowledge claims, and about who has the authority to make that call (see Fujimura 1998). Segal and Yanagisako's book was one result of heated debates that took place in anthropology in the United States at the end of the 20th century, resulting in sometimes stark institutional divides—splits of departments into cultural and biological wings, or into interpretative and evolutionist sections.

Even as fault lines in the discipline have widened, something new has begun to emerge. Ethnographers are exploring naturalcultural borderlands and situating their work within ecological concerns. They have involved themselves with an array of organisms and ecologies, and have been open to the methodological challenges these present. The work presented here, in this special issue, is exemplary.

Such work also illustrates how concerns in cultural anthropology overlap with concerns in different but companion communities and intellectual niches. Atmospheric chemist Paul Crutzen and biologist Eugene Stoermer coined the term *Anthropocene* to describe a new epoch in Earth's history. In their view, a key transformation in the life of the planet began some two hundred years ago, around the time the steam engine was invented, when human activity "gradually grew into a significant geological, morphological force" (2000:17). Crutzen and Stoermer argue that the Holocene, the geological epoch that began about 12,000 years ago, has now phased into the Anthropocene. In this frame of reference, anthropos has become an ambivalent figure, possessed of an agency scaled up to embrace—and endanger—the whole planet. Humans have come widely to be regarded as the primary agents driving climate change, mass extinctions, and the large-scale destruction of ecological communities (cf. Masco 2004 on the "mutant ecologies" created by nuclear testing). With this in mind, Deborah Bird Rose has recently called for "writing in the anthropocene," petitioning for renewed attention to "situated connectivities that bind us into multi-species communities" (2009:87). Multispecies ethnography involves writing culture in the anthropocene, attending to the remaking of anthropos as well as its companion and stranger species on planet Earth.

THE SPECIES TURN: ROOTS AND FUTURES

Exploring ways of bringing other species (and intellectual modes) back into anthropology, multispecies ethnographers have found inspiration in the work of scholars who helped found the discipline. Studies of animals have a long lineage in anthropology, traveling back canonically to texts such as Lewis Henry Morgan's 1868 *The American Beaver and His Works.* Here, Morgan studied the "acquired knowledge" of lodge, dam, and canal building transmitted among beavers. Drawing parallels between the engineering knowledge of people and of beavers, one among many species of what he thought of as clever animal "mutes," Morgan articulated an argument for animal rights: "The present attitude of man toward the mutes is not such, in all respects, as befits his superior wisdom. We deny them all rights, and ravage their ranks with wanton and unmerciful cruelty" (1868:281–282; and see Feeley-Harnik 2001). In the late 19th century, at a moment when anthropology was a field of natural history, scholars like Morgan worked across boundaries later secured against traffic between the social and natural sciences.

Many of Morgan's contemporaries engaged in what might be regarded as comparative multispecies ethnology. Take, for example, naturalist A. T. de

Rochebrune, who in 1882 launched the field of "ethnographic conchology," a subject devoted to studying "the use of Mollusks [snails, clams, and octopus], whether as objects of adornment or industry, or as substances used for food, dyeing, textile fabrics, etc. among ancient and modern peoples" (Clement 1998:175). Among a diversity of related interdisciplinary formations emerging in the late 19th century, only a few, like ethnobotany and ethnozoology, have endured.

Studies of hunting, husbandry, and the role of animals in systems of totem and taboo featured prominently in classic 20th-century ethnographies. Evans-Pritchard, Douglas, Lévi-Strauss, Radcliffe-Brown, and Leach are only the best known and most influential in this literature (see also Ingold 1988; Tambiah 1969). Such work grew out of long-standing interests in anthropology with systems of animal and natural classification (e.g., Bulmer 1967). Gregory Bateson—who worked across the disciplines of anthropology, psychology, linguistics, and epistemology—offered a cybernetic framework for understanding human–animal interactions, and wrote famously of human–dolphin communication (Bateson 1972, 1979). His theory of play and fantasy, and criteria of mental processes, broke down essentialized differences between human and nonhuman minds (Bateson 1972).

In the decades after midcentury, many cultural anthropologists worked to denaturalize intrahuman differences established along the lines of gender, race, class, nation, caste, sexuality, and ability. In the late 20th century, developments within the discipline of biology itself began to trouble assumptions that biotic "nature" could be a stable foundation on which forms of human social and cultural life might be built. The "facts of life" became highly malleable. Feminist scholars of kinship, gender, and reproductive technology—for example, Emily Martin (1987), Verena Stolcke, (1988), Marilyn Strathern (1992a, 1992b), Cori Hayden (1995), Lynn Morgan and Meredith Michaels (1999), Rayna Rapp (1999), and Sarah Franklin (2001)—were among the first to realize that the discipline should turn its attention to the making and remaking of biological knowledge and substance, particularly as it impinged on notions of relatedness. The new biologies transformed ideas about race, too. The "biology" of race migrated from population genetics to genomes, both reinforcing and undoing earlier understandings of human taxonomy (Fullwiley 2007; Haraway 1995; Montoya 2007; Nelson 2008; Reardon 2005; TallBear 2007). Anthropologists also attended to how new kinds of identities built around genetic and genomic knowledge and conditions—what Paul Rabinow in 1992 called "biosocialities"—came to organize novel political and social affiliations and communities (see Epstein 2008; Gibbon and Novas 2008; Pálsson 2007; Rose 2007; Taussig et al. 2003).

With the turn of the 21st century, *Homo sapiens* reappeared on the disciplinary stage, along with animal others and familiars. In conversations turning less to etymological reexaminations of ancient Greek or to continental philosophy, critical evolutionary and molecular anthropologists began to reexamine issues of race and gender in the context of new genetic technologies (e.g., Marks 2002, 2008). Lively conversations between biological and cultural anthropologists resulted in edited collections such as *Genetic Nature/Culture* (Goodman et al. 2003; for an earlier meditation on such convergence, see Ingold 1990), which featured chapters about gender, genealogy, race, and animals. *Genetic Nature/Culture* zeroed in on the changing contours of the "nature" wriggling within whatever "human nature" might mean now. The book's various authors—especially those writing on apes, sheep, and dogs—would not be surprised to hear Anna Tsing's suggestion that, "Human nature is an interspecies relationship" (Tsing n.d.; see Haraway 2008:19).[5]

New brands of animal anthropology twist the old, as more anthropologists have become curious about the lives of animals in labs, on farms, in agricultural production, as food, in rapidly changing ecosystems (for one review of recent work, see Fischer 2009:141–153). As a new generation of anthropologists began to attend to the remaking of human nature, others began to follow related logics of remaking at work in nonhuman natures. Celia Lowe (2006) described how the macaque, introduced to Indonesia's Togean Islands in the 1920s, was transformed from a feral "hybrid swarm" into to an "endemic species" by Indonesian scientists savvy at engaging with powerful international conservation agendas. Sarah Franklin's *Dolly Mixtures* (2007) brought old questions about kinship into dialogue with high-tech animal husbandry. Examining the technique of somatic cell nuclear transfer, famously used to produce the lamb clone Dolly, Franklin demonstrated biotech's potential to reorder what might count as the "nature" of reproduction and genealogy. Hugh Raffles, in his writings on insects, innovatively fused entomology with anthropology as he wrote genre-crossing meditations on butterfly collecting, cricket fighting, bee language, and the racialization of lice (Raffles 2001, 2010). Eduardo Kohn, taking up questions of cross-species communication, argued for a new theory of semiosis; his ethnography among the Runa in the Amazon sought to account for the communicative worlds Runa shared with their dogs (2007).

The new animal anthropology joined established, ongoing conversations in human–animal studies in the pages of such journals as *Animals and Society* and *Anthrozoös* and in the work of such historians as Harriet Ritvo, author of *The Animal Estate* (1989) and *The Platypus and the Mermaid* (1998), and Virginia

DeJohn Anderson, author of *Creatures of Empire: How Domestic Animals Transformed Early America* (2004). As Molly Mullin pointed out in her 2002 review essay, "Animals and Anthropology," the fusion of animal studies with anthropology would now ask anthropologists to revisit long-standing interests in evolution and domestication but also to craft new tools for understanding such phenomena as transgenic creatures and patented organisms (cf. Fuentes and Wolfe 2002; Ritvo 2002; see also *Where the Wild Things Are Now: Domestication Reconsidered,* edited by Cassidy and Mullin 2007). No longer, it seems, were animals simply "windows and mirrors" (Mullin 1999) into and of symbolic concerns (see, canonically, Leach 1964. See also Shanklin 1985). Their material entanglements increasingly require anthropologists to engage with biotic materiality and process, apprehended both through everyday experience and through technoscience (see also Benson 2010; Vivanco 2001). Donna Haraway's 2008 *When Species Meet* gathered up this emerging sensibility, arguing that animals are not just "good to think" (as Lévi-Strauss had it), or more instrumentally, "good to eat" (as Marvin Harris countered), but were also entities, and agents, "to live with."[6]

That "living with," of course, takes a variety of forms. It might be as companion species (Haraway 2003). It might be as "unloved others" (Rose and van Dooren in press). It might be as creatures with simultaneously parallel and entangled biographies, like the primates studied by ethnoprimatologists. In the words of Erin Riley, ethnoprimatology offers grounds for "reconciliation of biological and cultural anthropology" through the study of interconnections amongst primates—among *Homo sapiens* and other species (2006:75). Using the *ethno-* prefix, suggests primatologist Agustín Fuentes, "marks the inclusion of anthropogenic elements, including social, economic, and political histories and contexts as a core component of primatological inquiry" (this issue). In an allied move, Haraway (2010) has lately experimented with another arrangement of prefixes, calling the new animal anthropology "zooethnography."

"Living with" may mean deep engagement with particular animals. Alternatively, as Matei Candea suggests about human–meerkat relations, it may mean cultivating a mutual "detachment" as a mode of interaction—or, better, a mode of "interpatience" (Candea 2010). Animals may act as anthropologists themselves, studying the behavior of humans who feed, shepherd, and breed them (Paxson 2010). In zoos, captive apes have come to know the personalities and hierarchies of their human keepers as well as they know their own kin and kind. In some cases, human keepers even share antianxiety medications with the captive allo-primates in their care (Braitman 2010).

Animals may fuse, refuse, and confuse nature–culture categories and ontologies. Among the Siberian Yukaghirs, humans, animals, and spirits are seen as "endless mimetic doubles of one another" (Willerslev 2007; see also Nadasdy 2007). In a related mix of natureculture, Eduardo Viveiros de Castro draws on ethnographic studies of Amerindian cosmologies in the Amazon to advance a notion of "perspectival multinaturalism" (1998). He posits that humans, animals, and spirits participate in the same world, although with different sensory apparati, with the effect of generating only partially overlapping ontologies. If mononaturalism, the prevailing ontology of Occidental science was "blown to pieces" by multinaturalism, as Bruno Latour has it, then a multispecies approach to ethnography must engage with the alterworlds of other beings. Following Viveiros de Castro, we might accept Latour's claim that "No one can bear to be just one culture 'among others' watched with interest and indifference by the gaze of the naturalizers. Reality is once again becoming the issue at stake" (2002:21).

Displacing studies of animal behavior used by social conservatives and sociobiologists to naturalize autocratic and militaristic ideologies, Anna Tsing began studying mushrooms to imagine a human nature that shifted historically along with varied webs of interspecies dependence. Searching familiar places in the parklands of northern California for mushrooms—looking for the orange folds of chanterelles or the warm muffins of king boletes—she discovered a world of mutually flourishing companions (Tsing n.d.). Aspiring to mimic the "rhizomic sociality" of mushrooms, Tsing formed the Matsutake Worlds Research Group—an ethnographic research team centered on matsutake, an aromatic gourmet mushroom in the genus *Tricholoma,* a "species cluster." Following the matsutake mushroom through commodity chains in Europe, North America, and East Asia, this group has experimented with new modes of collaborative ethnographic research while studying scale-making and multispecies relations (Choy et al. 2009:380).

If we accept Tsing's notion that "human nature is an interspecies relationship" (n.d.; see also Haraway 2008:19), plants must be key players, too. One anchor point for plant ethnography is ethnobotany, the study of styles of knowledge and belief about plant life. Ethnobotanists and ethnobiologists have long been engaged in joint research and publication efforts with people often relegated in other studies to the role of ethnographic object (see Hunn 2007). Although some ethnobotanists have sometimes exploited the "savage slot," garnering media attention and professional accolades for accounts of their "wild odysseys" with shamans (Plotkin 1993), others have assumed the role of public intellectuals drawing on insights from cultural theory and ecology alike. Take, for example, the diverse corpus of

writing by Gary Nabhan on topics ranging from the roots of plants and people along Arab American routes (2008) to the natural and cultural history of tequila on U.S.–Mexico borderlands (Valenzuela-Zapata and Nabhan 2004). A new generation of ethnobotanists sees plants as social beings with agentive efficacy. Virginia Nazarea, in a 2006 *Annual Review of Anthropology* article about ethnobotany, writes: "Recent developments in anthropological thought, particularly in the areas of sensory memory or sensuous scholarship, marginality and mimesis, and landscape or place offer a way out of misplaced essentialism, which demands strict adherence to what does or does not count as biodiversity, knowledge, and memory" (2006:319). Cori Hayden, in her study of bioprospecting in Mexico (2003) brings ethnobotany firmly into the territory of political economy. Classic work on "plant teachers" in anthropology has also recently been taken up in poststructuralist literary theory (e.g., Doyle 2005, 2006).

With critical assessments of biodiversity discourse emerging from anthropologies of science and from political ecology (e.g., Helmreich 2009; Lowe 2006; West 2006), several scholars also began venturing away from animals and plants—toward microbiota that rarely figure in discussions of biodiversity. Astrid Schrader (2010) examines *Pfiesteria piscicida,* a "phantom dinoflagellate" with a "ghostly undecidablity," its agency only revealed by the massive fish kills it leaves in its wake. Ethnographers are turning to microbes as social agents, on land, in the sea, and in food (Dunn 2007; Helmreich 2009; Hird 2009; Paxson 2008). Even as "the human" moves a bit to the edge of this work, the discussion remains legibly anthropological—addressing questions of relatedness, exchange, governmentality, and signification. Paul Rabinow's *biosociality,* Marilyn Strathern's call to think "after nature," and various permutations of *biocapital* (Franklin and Lock 2003; Helmreich 2008; Sunder Rajan 2006) all lend themselves to multispecies inquiry.

Ethnographic studies of biocapital, biodiversity, and biosociality must all grapple with problems of representation. How can or should or do anthropologists speak with and for nonhuman others? That question pages back to a canonical anthropological problematic articulated by Arjun Appadurai in *Cultural Anthropology*: "The problem of voice ('speaking for' and 'speaking to') intersects with the problem of place (speaking 'from' and speaking 'of')" (1988:17). Appadurai writes, "anthropology survives by its claim to capture other places (and other voices) through its special brand of ventriloquism. It is this claim that needs constant examination" (1988:20). This reflexive examination should be redoubled when anthropologists speak with biologists, nature lovers, or land managers—and for the species that these agents, along with anthropologists, represent.

The work of Bruno Latour, who employed the phrase "nature-culture" to articulate relations among humans and nonhumans that sustain modernity, has been influential in thinking about such reflexivity (1993:7–11; and see Latour 1988 on microbes). Latour sees parallels between politicians who speak for other people and biologists who speak for nonhumans (2004). Latour's model for bringing democracy to nature involves consensus building among human "spokespeople." But questioning the ability of nonhumans to hold their representatives accountable, one might ask, "Can the non-human speak?" (cf. Spivak 1988; Mitchell 2002)—although this is not the right question either. "Non-human is like non-white," Susan Leigh Star said in a response to a presentation about the Multispecies Salon, "it implies a lack of something" (personal communication, September 12, 2008). The category of "non-human" is also grounded in human exceptionalism—the foolish notion that Haraway pushes us to move beyond.

An awareness of new microbiological facts of life suggests that fundamental boundaries between organisms, between species, are blurrier than previously thought. A close look at human skins, guts, and genomes reveals that human beings are a consortium of sorts, a medley of microbial becomings (Haraway 2008:31). By the late 20th century, biologists were beginning to find that viruses and other microbes transfer genes across species lines as well as higher level taxonomic categories like families or even phyla—spreading genetic material laterally among living creatures, rather than vertically down generations (Helmreich 2003). Evolutionary theorists began to rethink their mappings of interspecies relationships, challenging prevailing Darwinian orthodoxies about linear descent (Margulis and Sagan 2002; see also Hird 2009). In the words of Giles Deleuze and Felix Guattari: "Evolutionary schemas would no longer follow models of arborescent descent going from the least to the most differentiated, but instead a rhizome. . . . We form a rhizome with our viruses, or rather our viruses cause us to form a rhizome with other animals" (1987:11).

A rhizomorphic zeitgeist inflects many branches of biology. And anthropology has been infected, too. Fusing Margulis's *symbiogenesis* (the coming into being of new creatures through symbiosis) and Foucault's *biopolitics,* Stefan Helmreich (2009) suggests that we think of the governance of entangled living things as a question of *symbiopolitics.* A symbiopolitical multispecies ethnography turns out to have a good deal in common with the traveling methods of multisited ethnography (Marcus 1995). With animals, invasive plants, and microbes on the move, anthropological accounts ramify across places and spaces, entangling bodies, polities, and ecologies. Multispecies ethnographers, like multisited ethnographers, are starting to follow

genes, cells, and organisms across landscapes and seascapes, tracing how elements of *Homo sapiens* are creating becomings in the bodies of other species, and vice versa (Hayward and Kelley 2010).

Constantly morphing visions of natureculture have long been the humdrum stuff of bioengineering. Witness creatures such as OncoMouse™, a patented organism hosting human breast cancer genes (Haraway 1997). As naturalcultural hybrids proliferate, *Homo*, the conventional subject of anthropological concern, is no longer a clearly bounded biological subject. A multitude of literal human chimera—genetic hybrids named after the figural fire-breathing monsters of Greek mythology with a lion's head, a goat's body, and a serpent's tail—are turning human beings and becomings into things that are increasingly difficult to contain. Human genes are being incorporated into a diversity of common laboratory organisms—from rats and mice, to fruit flies, to *Escherichia coli,* to nematode worms.

The Multispecies Salon, the art exhibit staged in parallel with the AAA Annual Meeting of 2008, was one opportunity for anthropologists to revisit how human nature is now enmeshed with interspecies, transgenic, and multinatural worlds. Art forms have proved good to think with about "living with" in a multispecies world.

THE MULTISPECIES SALON

The Multispecies Salon art exhibit in the PLAySPACE Gallery of the California College of Arts—alongside the 2008 AAA Annual Meeting—explored how artists might be allies in thinking about biological beings and becomings in anthropology. Curators Eben Kirksey and artist Marnia Johnston distributed a "Call for Organisms" that was expressly experimental, "We are conducting a biodiversity survey of sorts that will bring together organisms living in the greater San Francisco Bay Area. We seek to represent creatures that are thriving in our yards, greenhouses, laboratories, and aquariums as well as those that are failing to flourish in our built landscapes" (Kirksey and Johnston 2008). This survey turned up a multitude of agents—endangered species of butterflies, rodents, and frogs—that already occupied the realm of "bios" and enjoyed the ambiguous benefits of biographical or political lives in human worlds. It also yielded parasites, weeds, and laboratory animals—creatures usually confined to the realm of "zoe," "bare life" that is killable. "One of the strengths of the show is that it is a big overturning of the pot," observed Todd Gilens, an ecoartist who participated in the Multispecies Salon, showcasing plans to wrap San Francisco buses with images of the Salt Marsh Harvest Mouse.

"You've gathered some things into a bowl called a 'gallery' and you've turned it over. And things are mixing, categories are mixing." The Multispecies Salon sought to blur the boundaries between bioart and ecoart—two traditions already difficult to distinguish, not least because the categories themselves are contested (see Catts and Zurr 2008:134–135).

Bioart is a "tactical biopolitics" (da Costa and Philip 2008:xviii). If Foucault understood biopolitics as disciplinary forms for optimization, coercion, and control of biology, then bioart is organized around attempts to detour, derail, or expose these regimes of domination and systems for managing "life." In 2000, bioart burst into the popular imagination when Eduardo Kac announced the birth of Alba, a rabbit that glowed green as a result of transgenically introduced jellyfish genes. These same genes illuminated one submission to the Multispecies Salon—a series of paintings with transgenic *E. coli* bacteria on Petri dishes by French artist Andre Brodyk. Many bioartworks, like Brodyk's, are novel organisms that have been created by artists or are dependent on humans for their continued survival (Bureaud 2002:39; Zurr 2004:402; see Kac and Ronell 2007).

In a foundational text of the ecoart movement, Suzi Gablik writes: "The ecological perspective connects art to its integrative role in the larger whole and the web of relationships in which art exists" (1991:7). Ecoart takes "art for nonhumans seriously" (Bower 2009). In contrast to the living media used in bioart, ecoart usually involves the traditional materials of sculpture, photography, and painting. At the salon, work by professional bioartists and ecoartists appeared alongside submissions from other participants—biologists, anthropologists, and schoolchildren. The curators extended Joseph Beuys's famous decree—"You are all artists"—beyond human realms (cf. Bishop 2004:61). For anthropologists accustomed to thinking about the agency of nonhumans (cf. Gell 1998; Latour 1993), it was hardly surprising to find living microbes, insects, and plants framed as creative agents.

Approaching the Multispecies Salon, visitors could hear the twitter of live cockroaches mingling with recorded sounds of chimpanzees screeching for meat. A video installation juxtaposed images of whooping cranes following ultralight aircraft on annual migrations with footage of humans playing with dolphins in captivity. Experimental organisms, fruit flies, and pictures of transgenic *E. coli* bacteria shared the space with apparently everyday household artifacts. One installation featured milk cartons and junk mail picturing missing amphibians in the place of missing children—creatures such as the golden toad of Monte Verde, Costa Rica, now presumed extinct. The piece asked, "Have You Seen Me?"

FIGURE 2. Frederic Landmann's "Wolbachia and Drosophila."

Previous collaborations between anthropologists and artists (i.e., Marcus and Calzadilla 2005) set the stage for transforming the art gallery into a site where the common interests and preoccupations of multiple disciplines could be explored. The gallery became a "para-ethnographic" site, a place where the boundaries between academic conference and traditional field site dissolved, generating conversation among anthropologists, biological scientists, and artists—encounters that generated ethnographic data and ethnographic analysis at the same time (cf. Marcus 2000; http://www.culanth.org/?q=node). The salon also hosted living parasites: symbiotic associations as well as human pathogens (see Figure 2). In French, *parasite* is polysemic, signifying "noise, static, or interference" in addition to a biological or social freeloader (Serres 2007). With 17 artists exhibiting and swarms of anthropologists passing through, there was an abundance of noise, interference, and crosstalk.

If the curators of the Multispecies Salon began by gathering together art and artifacts to illustrate conditions of life in the anthropocene—exploring the question of which species flourish and which fail in the shadows of human worlds—the profusion of subvisible organisms in the gallery left them wondering if the notion of "the anthropocene" was perhaps a bit too anthropocentric. Frederic Landmann, a postdoctoral scholar at the University of California, Santa Cruz, displayed vials from his lab filled with live fruit flies (*Drosophila* sp.), yeast to feed the flies, and thousands if not millions of *Wolbachia* bacteria living in the cells of the flies. "Long before our time, there were the insects," Hugh Raffles reminds us. "For as long as we've been here, they've been here too. Wherever we've traveled, they've been there too. . . . Not just deeply present in the world but deeply there,

creating it, too" (2010:3). *Wolbachia* are old, too, having been around at least 100 million years (Stouthamer et al. 1999). They are one of the most abundant microbes on earth—infecting over 75 percent of studied invertebrates, including spiders, mites, crustaceans, nematode worms, and insects (Jeyaprakash and Hoy 2000).

Eva Hayward (this issue) suggests that "inverts"—the kind without backbones as well as the sort who transpose gender roles—interrupt heteronomativity. *Wolbachia* are agents of invert becomings, with millennia of experience in forming what Hayward and Lindsay Kelley call "tranimals"—enmeshments of *trans* and *animals,* critters that cross or queer normative sex and gender configurations. Because *Wolbachia* bacteria are too big to fit into the sperm of invertebrates, they are usually only transmitted from invert mothers to children. If classic biomedical textbooks contain tales about human sperm and eggs that naturalize patriarchical stereotypes about productive men and wasteful women (Martin 1991), the *Wolbachia* literature refracts related tales through the bacteria's imagined point of view: "Because males are not transmitters of such symbionts, they are 'waste' from the perspective of the symbiont" (Stouthamer et al. 1999:82). To spread in subsequent generations, *Wolbachia* transform the bodies and the reproductive dynamics of their invert hosts. When female wasps of certain species are infected with the bacterium they become parthenogenic—meaning that they no longer need to have sex with males to produce viable offspring. *Wolbachia* perform a sex-bending trick in some crustaceans and in at least one insect species—changing genetic males into reproductively viable females. Regarding *Wolbachia* as a tranimal-forming agent is not a naturalizing move but an attempt to trace sexualized alterities and alternative imaginaries (Hayward this issue), uncanny microbial becomings at work all around *H. sapiens.*

Playing with popular anxiety surrounding microbial becomings, performance artist Caitlin Berrigan created a series of sentimental objects in an attempt to "befriend a virus." Growing tired of the rhetoric of war commonly used by health care workers to describe her illness, hepatitis C, Berrigan, who carries the virus in her blood, performed what she called a "nurturing gesture," at the Multispecies Salon. Drawing her own blood, she offered it to a dandelion plant as a nitrogen-rich fertilizer: "Blood containing human pathogens is still a good fertilizer for plants," she argued, "I can give to the dandelions what would be a danger to any human" (see Figure 3). Enacting a relation of shared suffering, of mutual care and violence (cf. Haraway 2008), Berrigan told audience members that she takes dandelion root as medicine to help her liver cope with viral infections.

FIGURE 3. "Lifecycle of a Common Weed" by Caitlin Berrigan.

Noting that the recipient of her nurturing gesture is regarded as a "weed," Berrigan worked to give the dandelion biographical and political life (*bios*), elevating it from the realm of bare life. "The dandelion actually has a lot to offer us even though they grow everywhere, and are killed with herbicides," she later told us (see also Berrigan 2009). Berrigan's art and personal medical regimen might be understood as a "microbiopolitical" intervention, calling attention to how living with microorganisms (in this case, a pathogenic virus) is caught up in discourses about how humans ought live with one another (Paxson 2008:16). Appropriating tools of biotechnology and syncretic medical traditions, she worked to create a symbolic cycle of nutrients in urban environments, on a micro local scale, in opposition to dominant institutionalized practices and global commodity chains (cf. Paxson 2008:40).

Marnia Johnston's "Twins," is a ceramic piece, a chimerical pair of grubs with wings (see Figure 4). Only adult insects have wings. Their juvenile forms, larvae, do not. "Humans are acquiring adult characteristics, such as breasts, at an early age," Johnston told us. "Endocrine disrupting chemicals, like Bovine Growth Hormone," she continued, "are working on the bodies of humans and multiple other species. I want people to think about how our chemical dependencies change us and the world we live in."

FIGURE 4. "Twins" by Marnia Johnston.

The Twins are littermates of Paranoia Bugs, ceramic sculptures that Johnston began to make in 2005 after the U.S. invasion of Afghanistan. "The paranoia of the U.S. was a kind of swarm," Johnston said, "where fears fed and bred upon each other, crawling and overtaking everything in their path." This terrifying spirit infects the military strategists, mathematicians, and entomologists who informed Jake Kosek's ethnographic account of drone aircraft in the hills of Afghanistan and Pakistan, programmed with algorithms modeled on bee behavior to adopt "swarming" tactics (Kosek this issue). Perhaps these flying insectoid-machines, and the Paranoia Bugs, embody the nightmares of Hugh Raffles: "There is the nightmare of fecundity and the nightmare of the multitude. . . . There is the nightmare of knowing and the nightmare of non-recognition. . . . Nightmare begets nightmare. Swarm begets swarm. Dreams beget dreams. Terror begets terror" (2010:201–203).

Johnston gave paranoia a dark body and spindly legs. Initially, she held back, not completing a full swarm, just making a single Paranoia Bug. She began to dabble in bioart—to learn new laboratory techniques so that she could start working with living matter. This dabbling attracted the attention of "Mills Gurman" (name changed by request), an employee of Monitor 360 who was working for the CIA to study "biohacking" and bioterrorism. Johnston agreed to meet with Gurman, hoping to convince him that her artistic practice, and bioart in general, was benign, posing no public health risks. "The meeting left me wanting to know more about

what he would report back to the CIA," Johnston said, "especially now that the government had my name and associated me with a possible threat." This attention from a CIA contract employee, and later from the FBI Weapons of Mass Destruction Directorate, had a chilling effect on Johnston's bioart. She turned back to her old ceramic projects—kneading clay, carefully attending the kiln, layering on colorful glaze, creating a multitude of figurines that embodied her concerns. The paranoia of U.S. government agents gave the Paranoia Bugs new life. The second generation of the bugs had a fleshier appearance and were less steady on their legs than the prototype. "They are stem cells gone wild," she told us. "Some have mouths and cannibalize their brethren, others have wings but still can't fly. Fearing their own kin, and suspicious of the motives of others, Paranoia Bugs are always on the lookout—to make sure they don't get eaten." Johnston's sculpture gave a material form to anxiety, frustration, and fear—fusing the speculative fabulations of biocapitalism with specters of bioterror.

Reappropriating the tactic of swarming from U.S. government security forces, Johnston has helped form a curatorial collective that will stage a new art exhibit, the Multispecies Salon 3: SWARM, alongside the 2010 AAA Annual Meeting in New Orleans. The Paranoia Bugs will make an appearance in the mix with work by local artists and community activists—for example, who will do a "seed bomb" installation piece throughout the city, inviting visitors to the art gallery to engage in "guerilla bioremediation" by throwing these bombs over fences to seed toxic sites that have been abandoned by owners and regulatory agencies. If the Multispecies Salon started as a biodiversity survey, an attempt to account for the multiple beings living along with humans in the city of San Francisco, it was opened to a multitude of agents who created a becoming that was increasingly difficult to contain.

MULTISPECIES BEINGS AND BECOMINGS

The reader may worry that the above survey, taking us from humans to animals to plants to fungi to microbes, risks reinstalling the "human" as a central reference point, and even offers a kind of great chain of being as an organizing principle. We agree with Eduardo Kohn that,

> If we take otherness to be the privileged vantage from which we defamiliarize our "nature," we risk making our forays into the nonhuman a search for ever-stranger positions from which to carry out this project. Nature begins to function like an "exotic" culture. The goal in multi-species ethnography should not just be to give voice, agency or subjectivity to the nonhuman—to

> recognize them as others, visible in their difference—but to force us to radically rethink these categories of our analysis as they pertain to all beings" [personal communication, March 29, 2010]

It is for this reason that, in what follows, we and the other authors take aim at a hidden ontology in the frame of "multispecies"—that of "species." Wrangling with species (and genus, family, order, class, phylum, kingdom, domain, when possible) means that we need to take natural and cultural categories as we receive them and try simultaneously to rethink and undo them.

Karl Marx saw human "species being" as essentially creative, essentially forward looking. He contrasted human species being to the being of the bee, writing "what distinguishes the worst architect from the best of bees is this, that the architect raises his structure in imagination before he erects it in reality" (Marx 1990:284). Here, human species being is a sort of being that has consciousness of itself as a species. Marx's species being, then, is a variety of anthropos in the classical sense, a being that can reflect on itself. But this "species" phrasing, read a century and a half after Darwin, also opens it up to a materialist query from the evolutionary biological sciences.

The gender specific binomial *Homo sapiens*, after Linnaeus's foundational 18th-century nomenclature, translates as "man the knowing," placing thinking at the core of human nature. Thinking becomes the measure next to which other species are to be judged. There have been attempts to reroute this common sense. Terms such as *Homo faber* ("man the maker"—championed by Karl Marx, Henri Bergson, and Hannah Arendt) and *Homo ludens* ("playing man"—articulated by Johan Huizinga [1949] in his 1938 book of that title) offer differently inflected species beings.[7] Valences of *homo* from Latin that have fallen out of fashion in the last several hundred years of popular and technical usage—"fellow" or "creature" (Wade and Kidd 1997)—might be revived even as the stability of *Homo sapiens*, the biological species, is being unmade by bioengineering.

If anthropology has in the last 25 years accelerated its querying of what we might mean by "culture" (Abu-Lughod 1991; Clifford 1986; Gupta and Ferguson 1992), authors in this issue take aim at "species" as a grounding concept for articulating biological difference and similarity. This project has a precedent in the philosophy of biology, which has examined the coherence and limits of the species concept (see, e.g., Dupré 1992). In *When Species Meet,* Haraway notes that the very notion of species itself is unsteady, "inherently oxymoronic," referring at once to logical types as well as to that which is relentlessly specific.

How have the authors assembled in this issue's thematic cluster—originating as members of the swarm that materialized at the Multispecies Salon—enacted multispecies ethnography?

Eva Hayward's ethnography of cup coral encounters at the Long Marine Laboratory in Santa Cruz, California, advances the notion that species are "impressions"; they carry the traces—structural, behavioral, and textural—of those others with whom they have shared past contiguities and intimacies, in both evolutionary and biographical time. Reporting on her work as a lay technician working with *Balanophyllia elegans,* Hayward writes of the sensuous interplay of vision and touch in her encounters with coral, and she develops an analytic she calls *fingeryeyes* to articulate the palpability of cross-species encounter. She is interested in the overlay of sensoriums and the inter- and intrachange of sensations across species boundaries. Taking the Long Marine Lab's research into coral sex and reproduction as one focus, Hayward employs feminist and queer theory to think anew about how corals generate generations.

Agustín Fuentes is also interested in what happens when species overlap—not with respect so much to their sensoria as with respect to their positions in ecologies. In his essay, Fuentes elaborates on the concept of "niche construction" to understand the copresence of humans and Rhesus macaques at Balinese temples. Fuentes suggests that the niche concept can be rearticulated to understand natural-cultural contact zones (cf. Haraway 2008)—incorporating present-day ecological interactions as well as historical, political, and economic forces. Fuentes deploys a hybrid methodological tool kit, using the observational techniques of primatology in conjunction with ethnographic practice to study the lives of monkeys at Balinese temples—creatures that subsist on ritual offerings of food, handouts from tourists, as well as plants and animals acquired from riverine forest corridors between temples. He reproduces wry comments from Balinese tour guides, who see themselves as occupying a similar social niche as the monkeys in the geopolitical economy: waiting for tourists to arrive.

Staying in Indonesia, Celia Lowe takes as her subject the avian influenza virus H5N1, examining how in the early 2000s this "quasi-species" generated fear and speculation about its possible becomings, locally, nationally, internationally, globally. Using the technical notion of a "cloud" of viral genomes as a rhetorical device to understand the proliferation of plans and narratives around H5N1, Lowe enfolds humans, chickens, and viruses into an account of an event that never quite came to be—a global pandemic of avian influenza. Gaining access to the security cultures surrounding the lives of elite expatriates who live in Indonesia, and dwelling

in the enclaves of the urban poor, she reports on the gassing, burning, and burying alive of chickens, during what some have called "a global avian genocide."

Finally—and staying with the theme of security—Jake Kosek zeroes in on the bees Marx used as a foil for humans, examining the militarization of honeybees and the use of "the swarm" as a metaphor by the U.S. military in the "war on terror." Grounding his ethnographic practice in his hobby of bee keeping, Kosek follows bees and mathematical swarming algorithms from public debates in the U.S. Congress to DARPA-funded projects at the Los Alamos National Laboratory to the battlefields of Afghanistan. Engaging with clouds of ideas about swarming, Kosek departs from literal descriptions of bee behavior to wrangle with critical theory on the topic (by Deleuze and Guattari, among others) to describe how swarms have found a place to flourish within the modern militarized state. Teasing out the mimetic logic of Pentagon officials, Kosek finds abundant evidence of terrifying animal becomings. The U.S. government is assembling legions of insectoid robots and commanding soldiers to embody the form and tactics of the swarm. Like Hayward, Kosek centers his attention on the sensory differences his subject organisms exhibit from humans—and he shows how these are being exploited and rebuilt for human purposes. A multisensory approach—grappling with unfamiliar sensoriums, with different kinds of touch, smell, taste, and vision—characterizes this multispecies ethnography.

All this work suggests that *Homo sapiens faber ludens* has, as Haraway puts it, "never been human," or at least never only.[8] Humans have always been what Haraway calls "messmates," and what Sarah Franklin (2008) calls "mixmates." How then might multispecies ethnography mix with cultural anthropology more broadly?

Cultural Anthropology was chartered to bring anthropology into dialogue with articulations of the culture concept issuing from other fields and disciplines, notably cultural studies (see Marcus 1986). The early decades of the journal were keenly interested, too, in literary theory, postmodernism, feminism, and in provincializing dominant traditions. Multispecies ethnography asks cultural anthropologists to reengage with biological anthropology and to take a look at eco- and bioart (as both allied practices and objects of study)—to craft new genres of naturalcultural criticism. Multispecies ethnographers follow Dan Segal's observation that "whether or not anthropology passes muster as 'real science,' it today operates from a position *in* the sciences broadly construed, and, beyond this, that this is something we must learn to negotiate if we wish to participate in more fruitful dialogues with other disciplines and diverse publics" (2001:452; see also Fischer 2007).

Multispecies ethnography is a site for such dialogue. It encourages anthropologists to ask, ethnographically, what happens when *Homo sapiens* and its interspecies, multispecies, and quasi-species familiars, burrow into the biology that animates anthropos?

ABSTRACT

Anthropologists have been committed, at least since Franz Boas, to investigating relationships between nature and culture. At the dawn of the 21st century, this enduring interest was inflected with some new twists. An emergent cohort of "multispecies ethnographers" began to place a fresh emphasis on the subjectivity and agency of organisms whose lives are entangled with humans. Multispecies ethnography emerged at the intersection of three interdisciplinary strands of inquiry: environmental studies, science and technology studies (STS), and animal studies. Departing from classically ethnobiological subjects, useful plants and charismatic animals, multispecies ethnographers also brought understudied organisms—such as insects, fungi, and microbes—into anthropological conversations. Anthropologists gathered together at the Multispecies Salon, an art exhibit, where the boundaries of an emerging interdiscipline were probed amidst a collection of living organisms, artifacts from the biological sciences, and surprising biopolitical interventions.

Keywords: multispecies ethnography, animal studies, nature/culture, bioart

NOTES

1. The phrase "Multispecies Salon" emerged over dinner conversation among Rosa Ficek, Heather Swanson, and Eben Kirksey in 2006 when they were all graduate students at the University of California (UC), Santa Cruz. Later that year, in conjunction with the AAA Annual Meeting in San Jose, Eben Kirksey staged the first Multispecies Salon at Oakes College with support from the UC Santa Cruz Center for Cultural Studies and the Science Studies Cluster. The Multispecies Salon 2 art exhibit was organized in 2008 by Eben Kirksey, Marnia Johnston, Craig Schuetze, Patricia Alvarez, and Christopher Newman with funding from the National Science Foundation (Award number 750722), the History of Consciousness Program of UC Santa Cruz, the Anthropology Program at New College of Florida, and Anthropology at the Massachusetts Institute of Technology. Seventeen artists and intellectuals submitted work to the Multispecies Salon art exhibit: Andre Brodyk, Traci Warkentin, Caitlin Berrigan, Carl Rettenmeyer, David Edmunds, Denise King, Frederic Landmann, Jake Metcalf, Kamil Dawson, Kathy Gritt, Luke Santore, Marnia Johnston, Patricia Piccinini, Rachel Mayeri, Ruth Wallen, Todd Gilens, and Eben Kirksey. Other creative agents included Donna Haraway, Agustín Fuentes, Eben Kirksey, Sarah Franklin, Jake Kosek, Geoffrey Bowker, Susan Leigh Star, Karen Barad, Bill Maurer, Astrid Schrader, Kim TallBear, Paige West, Susan Harding, Heather Swanson, Rusten Hogness, Traci Warkentin, Heather Paxson, Mogu Mogu (Timothy Choy and Shiho Satsuka), Jonathan Marks, and Eduardo Kohn. This article is testimony to, and a product of, this collective and collaborative work. We thank all of these scholars—as well as several more who commented on this essay, including Etienne Benson, Laurel Braitman, and Matei Candea. We thank Mike and Kim Fortun as well as anonymous reviewers for *Cultural Anthropology*.
2. One recent bioart show has centered on Deleuze and Guattari's ideas about "becoming animal" (Thompson 2005). Deleuze and Guattari distinguish individuated "Oedipal animals" from pack animals that form a multiplicity and a becoming. "Anyone who likes cats or dogs is a fool,"

they write. Deleuze and Guattari then celebrate the social forms of pack animals, like wolves, that "grip every animal in a becoming" (1987:265). We join Donna Haraway in only going halfway with Deleuze and Guattari. In the work of Deleuze and Guattari, Donna Haraway writes, "patrilineal thinking, which sees all the world as a tree of filiations ruled by genealogy and identity, wars with rhizomatic thinking, which is open to nonhierarchical becomings" (2008:28). "So far, so good. . . . But the wolf/dog opposition is not funny. . . . I am not sure I can find in philosophy a clearer display of misogyny, fear of aging, incuriosity about animals, and horror at the ordinariness of flesh, here covered by the alibi of an anti-Oedipal and anticapitalist project" (Haraway 2008:28–30). We side with Haraway in rejecting Deleuze and Guattari's wolf–dog opposition. Still, we join Deleuze and Guattari in departing from individuated subjects of becoming to explore the possibilities that arise with a swarming multitude (cf. Hardt and Negri 2004:92).

3. On "life," see, for example, Bamford 2007, Beihl 2005, Franklin and Lock 2003, Hartouni 1997, Helmreich 2009, Landecker 2007, Petryna 2002, Rabinow 1992, and Taylor and colleagues 1997; on labor and (bio)capitalism, see Cooper 2008; Fortun 2001, 2008; Franklin and Lock 2003; Sunder Rajan 2006; Thompson 2005; and Waldby and Mitchell 2006; on language, see Haraway 1991, 1997, and Downey et al. 1995.
4. Although see Fischer, in which "nature" and especially human "nature" is an "ambivalent term" (2009:114), an "odd job word," or a "covering label for the paradoxical ambiguity" of "that which is both our other and our 'essential' self," with multiple natures—first, second, reengineered—interacting. As "our knowledge expands and reconfigures itself (biochemistry, neuroscience, comparative genomics, etc.) this ambiguity also expands" (Fischer 2009:156).
5. Compare Clifford Geertz's 1962 essay, "The Growth of Culture and the Evolution of Mind," which recounts human evolution from Australopithecines forward. In that tale, human nature—defined as culture, argued to be the result of increased brain size and complexification—is more biogeographically driven than it is by "other" species. Compare, too, to Tsing's claim, Helmreich's suggestion at the end of *Alien Ocean,* an ethnography of new imaginations of the relation of ocean microbes to human life, that we are witnessing "the saturation of human nature by other natures" (2009:284).
6. For innovative uses of animals to "think with," see Haraway 1989 (see Strum and Fedigan 2000 for a response), Tsing 1995 (on bees and national identity), Maurer 2000 (on fish and money), and Subramaniam 2001 (on "invasive species" and xenophobia).
7. Tom Boellstorff's *Homo cyber* (2008) posits that "the human" is an entity characterized by its fashioning as virtual—as always potential. Such forms as *Gyno sapien* or the more linguistically analogous *Femina sapien,* although vanishingly rare, play with and query the gender specificity here.
8. Helmreich (2009:284) suggests the possibility that we are becoming *Homo alienus.*

Editors Note: Cultural Anthropology has published a number of essay that map new directions in anthropology, including George Marcus's "The End(s) of Ethnography: Social/Cultural Anthropology's Signature Form of Producing Knowledge in Transition" (2008); Daniel Segal's "Editor's Note: On Anthropology and/in/of Science" (2001); Michael M. J. Fischer's "Four Genealogies for a Recombinant Anthropology of Science and Technology" (2007); and Gary Lee Downey, Joseph Dumit, and Sarah Williams's "Cyborg Anthropology" (1995).

Cultural Anthropology has also published essays on art and/as cultural analysis. See Kenneth George's "Ethics, Iconoclasm, and Qur'anic Art in Indonesia" (2009), and Liam Buckley's "Objects of Love and Decay: Colonial Photographs in a Postcolonial Archive" (2005).

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