

Ursula K. Heise

Multispecies Futures and the Study of Culture

1 Cultural Study and the Shape of Change

When I went to graduate school in the mid to late 1980s, first in Germany and then in the United States, it was hard to keep up with the pace of change. New theoretical paradigms in literary and cultural studies kept emerging, mingling, and inflecting each other: New Left Marxism, feminism, postcolonialism, poststructuralism, deconstruction, New Historicism, Lacanian psychoanalysis, gender studies, queer studies, and critical race theory all demanded attention to core theoretical texts, central concepts, distinctive methodologies, and often particular styles of argument. Cultural studies itself became another one in the march of paradigms. As the cross-disciplinary US offspring of the Birmingham School, cultural studies blended Marxist theories of revolution and the Foucauldian rhetoric of “circulation of power” with elements of gender and race theory in the late 1980s and early 1990s. In its case studies, it relentlessly attacked and sought to do away with, once and for all, the distinction between high culture and popular or mass culture.

Conceived in this way, cultural studies imported methods from anthropology and broadened the literary canon of study immensely. At the same time, it paid much more direct attention to the users and consumers of texts rather than just to their producers, with Janice Radway’s study of romance and its readers and Constance Penley’s analyses of technoculture and fan fiction standing as early models of this transformation (Radway 1984; Penley 1991). While this altered perspective arguably transformed literary studies for good, cultural studies itself ran out of steam over the course of the 1990s. The theoretical contradictions between Marxist and poststructuralist assumptions about social change, the fear of “totalization” and the consequent narrowing of analytical focus, and the detailed attention lavished on cultural phenomena that were either forgotten or became trivial in just a few short years all contributed to the fizzling-out of cultural studies as a dominant theoretical paradigm, even as some of its theoretical and methodological innovations endured.

Sometime in the 1990s, the shape of change itself changed in a good deal of humanistic research. Studies of memory and trauma moved to the forefront at about the same time as the focus on varieties of postmodernism in literature and the arts gave way to concepts such as globalization, hybridity, cosmopolitanism,

and border cultures, to name just a few. But while these concepts worked as powerful organizing categories of research across disciplines in the humanities and qualitative social sciences, they did not impose one dominant theoretical paradigm. Rather, they gave rise to clusters of approaches from different theoretical perspectives. This tendency has continued in the disciplinary innovations of the last two decades, which, in the United States at least, have mostly taken the shape of research areas organized around a central theme that does not in and of itself demand specific theoretical assumptions. Typically, these areas have come with labels such as ‘x studies’ or ‘y humanities’: disability studies, food studies, and human-animal studies, for example, or digital humanities, medical humanities, environmental humanities, and urban humanities. Many of them have catalyzed innovations in research and teaching that have crystallized in centers, programs, majors and minors; few of them, to date, have resulted in the creation of new departments.

Many, though not all, of these new areas of study have emerged from or sought to create new connections to particular areas of science and technology. Disability studies, narrative medicine, and the medical humanities, for example, use methods of analysis from anthropology, history, and literary and cultural studies to explore historically and culturally varying ideas about “normal” bodies, health, and disease; about the roles of doctors, patients, and their means of communication; about childhood, maturity, and old age; and about the representation of organs, illnesses, and cures in texts and images, including new technologies of medical imaging. Food studies focus on the complex interface of agriculture, economy, and culture in the production, distribution, consumption, and representation of food. In the process, the field draws on the practical knowledge of farmers and gastronomers as well as on the academic expertise of agronomists, anthropologists, ecologists, sociologists, and researchers of literature and film. The environmental humanities bring together anthropology, ecocriticism, cultural geography, history, and philosophy to analyze assumptions about ecologies, natures, landscapes, and nonhuman species that inform past and present environmental discourses. The digital humanities connect to the electronic landscape of computers, the Internet, and social media in two distinctive ways: either by analyzing digitally generated texts and images with existing methods of historical and literary research, or by applying new digital tools to established canons of texts (Fitzpatrick 2011).

The study of culture or, more precisely, of cultures (emphatically in the plural) is crucial to all of these fields even when the concept itself is not foregrounded. How gender, sexuality, race, and age inflect the practice of medicine varies by historical period and region (a question for the medical humanities). What foodstuffs are considered edible or inedible, good or bad for one’s physical

health, or spiritually acceptable or unacceptable in different communities often has deep historical, ecological, and cultural roots, and shapes current practices of growing, harvesting, and cooking that food studies explore. Human-animal studies engage with recent scientific insights into the cognition, perception, and skills of individual animals and the cultures and politics of animal communities, often so as to question the exceptionality of the human subject. In the process, the field draws on historical and cultural comparisons to explore the different ways in which the boundary between humans and animals has been drawn in the past and present. The urban humanities explore the historical memories, spatial sensibilities, social inequalities, and cultural frameworks that shape architecture, design, landscape architecture, and urban planning. A great deal of the intellectual energy in many of these recent fields, in fact, emerges precisely from their cultural, historical, linguistic, and media-theoretical reframing of questions that were earlier thought to be the unique purview of biology, ecology, engineering, medicine, computer science, public policy and planning, or other disciplines.

The study of cultures today demonstrates its relevance and urgency precisely at these intersections. In turn, cultural studies are being reshaped by the central research questions around which these new fields revolve. In this article, I will briefly highlight two areas in which culture is currently being re-envisioned: one, in the tension between discussions about the Anthropocene and the emergence of various strands of posthumanism; and two, in the expansion of culture beyond the human sphere. As I will show in the last section, this more-than-human reconceptualization of culture is also transforming literature and the arts.

2 Culture between the Anthropocene and Posthumanism

In my field of research, the environmental humanities, literary and cultural studies over the last decade have increasingly been re-envisioned under the dual influences of debates about the Anthropocene and posthumanist theories. The concept of the Anthropocene, proposed casually at a conference by the ecologist Eugene Stoermer in the 1980s and formalized in a series of publications spearheaded by the atmospheric chemist Paul Crutzen since 2000, is now ubiquitous in discussions of the environmental present and future. Crutzen and Stoermer proposed in their original publications that we no longer inhabit the Holocene, geologists' designation of the last 12,000 years, but a new epoch, the Anthropocene. The name "Age of Man," they argued, was justified because of humans' pervasive impacts on global ecosystems and the likelihood that traces of these

impacts will be visible in the Earth's geological strata for millennia to come (Crutzen and Stoermer 2000; Crutzen 2002). As of this writing, professional associations of geologists have yet to issue their stamp of approval for this change of nomenclature. But in the meantime, the idea of the Anthropocene has developed a cultural life of its own in a wide range of academic and popular publications as well as exhibitions, conferences, and seminars in Australia, North America, and Western Europe (less so in other regions).

In the process, different narratives have accreted around the concept.¹ For Crutzen as well as many journalists, writers, and activists, the neologism of the Anthropocene re-emphasizes a narrative that has long shaped environmentalist thought and writing: that of the deterioration and destruction of nature under the impact of modern societies. In other words, it is a new term for an old story that portrays humans' interactions with nature as a process of nature's decline. But this narrative has not gone uncontested. Diane Ackerman's *The Human Age: The World Shaped by Us* (2014) takes the opposite tack, interpreting the Anthropocene not as an age of destruction but of unprecedented human ingenuity and creativity – qualities that in her view will let humankind overcome the environmental challenges it currently faces. In Ackerman's approach, the Anthropocene becomes a shorthand for the Enlightenment narrative of technological and social progress that environmental thinking has persistently criticized over the last two hundred years.² In between these extreme positions, environmentalists such as the biologists Peter Kareiva and Joseph Mascaro, the geographer Erle Ellis, and the science writers Emma Marris and Christian Schwägerl have sought to map out a more moderate landscape of hope. They take the recognition that no part of the Earth's atmosphere and biosphere remains untouched by human impacts – climate change alters even terrestrial and marine regions that humans have not visited in their own bodies – as a point of departure for envisioning a new environmentalism that is less beholden to conceptions of nature and environmental cultures of the past, and that does not so much seek to restore the ecosystems of the past as to design ecosystems for the future that will allow both humans and nonhumans to flourish. In the process, all of them move away from pristine nature and wilderness as yardsticks for environmental activism in the future, emphasizing instead the complexity and value of the mixed and cultivated landscapes to

¹ For a more detailed discussion of the divergent Anthropocene narratives, see Heise 2016, ch. 6.

² Over the last two decades, some strands of the environmental movement have turned against this critique of modernization and embraced environmental modernization instead; the most prominent advocates of this position in the United States have been Breakthrough Institute founders Ted Nordhaus and Michael Shellenberger 2004, 2007.

which human intervention has given rise (see Ellis and Ramankutty 2008; Kareiva et al. 2007; Marris 2011; Marris et al. 2011; Schwägerl 2010).

At stake in these more cautiously optimistic perspectives on the Anthropocene is the attempt to rethink human cultures as part of the nature that environmentalism seeks to conserve and sustain. The idea that climate change, in particular, puts conventional boundaries between nature and culture into question is not, of course, new: The environmental writer and activist Bill McKibben had already argued in his book *The End of Nature* (1989), one of the first nonfiction books to ring the alarm about climate change, that for modern societies at least, nature is defined by its separation from culture, and that climate change therefore implies the end of this type of nature and the experiences it enables. But if this change in nature presented itself as a relentlessly melancholy prospect to McKibben, writers such as Marris and Schwägerl highlight the opportunities and joys that a different understanding of the natural might bring, precisely because it does not interpret human interventions as by definition detrimental to what is most valuable about the nonhuman world.

From a different theoretical purview, the historians Dipesh Chakrabarty and Julia Adeney Thomas as well as the philosopher Dale Jamieson have also questioned the boundary between nature and culture. Climate change as an outcome of human agency though not of human intention, Chakrabarty argues in his now classic essay “The Climate of History” (2009), turns humanity into a geological force. Other writers (the paleoanthropologist Richard Leakey, for example) had already suggested that humankind’s current environmental impact could be compared to the impact of the meteorite sixty-five million years ago that triggered the extinction of the dinosaurs along with more than eighty percent of the other species then in existence – another way of suggesting that humans collectively have achieved geological or even cosmological force. But Chakrabarty is particularly interested in the challenges this power poses for historical thinking: “Humans have become geological agents very recently in human history. In that sense, we can say that it is only very recently that the distinction between human and natural histories – much of which had been preserved even in environmental histories that saw the two entities in interaction – has begun to collapse” (Chakrabarty 2009, 207). As a consequence, Dale Jamieson has pointed out, the sense of humankind’s enormous power as a species goes along with a sense of utter powerlessness on the part of individuals, both equally symptomatic of the Anthropocene (Jamieson 2017, 15).

Julia Adeney Thomas sees questions about the distinction of human identity and culture from nature arising not only from the large scales of time and space that climate change forces us now to consider as part of humans’ cultural history. She also points to the challenges that have come from other confrontations of

culture with biology. Microbiology, she argues, has recently shown that microbes are constituent parts of the human body, “inseparably ‘us,’ more responsible than ‘we’ are for ‘our’ existence by most calculations” (Thomas 2014, 1594), and that they contribute more genes to human survival than humans themselves contribute. In this view, “a person is not an individual but a congregation“ of such nonhuman organisms (Thomas 2014, 1594). By the same token, the hundreds of thousands of chemicals that twentieth-century societies have introduced into the natural environment are now imbricated into the human organism to the point where body and environment cannot be categorically distinguished – not only in the case of victims of industrial accidents, but quite ordinary humans as well (Thomas 2014, 1596–1602). These alterations, all part and parcel of the Anthropocene, not only challenge conventional definitions of the human, but also imply divergent understandings of human bodies and practices that are not compatible with each other: “in paleobiology, ‘we’ are an increasingly domineering species operating over vast eons of time; in microbiology, ‘we’ are a coral reef of many species spreading out in awkward archipelagos of co-dependent beings; and in biochemistry, ‘we’ are a semi-industrialized product of the last, brief half-century,” Thomas argues (Thomas 2014, 1603). In this context, human agency as well as human cultures clearly need to be envisioned in very different terms, depending on which perspective on human nature one privileges.

In her multiscalar survey of the different types of human subjects that the Anthropocene implies, Thomas already maps some of the territory that theories of posthumanism have traversed over the last few decades (though she herself does not use the term). Typically, posthumanist approaches envision human existence, intentionality, and agency as neither singular nor exceptional, but as part of networks that also include other modes of being and agency. Posthumanisms, though, differ fundamentally in how they envision these networks. The “heterogeneous” social networks of actor-network theory, made up of human and non-human, animate and inanimate agents that relate to each other in material as well as semiotic ways, were proposed by Bruno Latour, Michel Callon, and John Law in the 1980s. The German sociologist Niklas Luhmann developed a systems theory whose central tenet is that individuals do not “form part” of societies, but that individuals and societies constitute one another’s environments in a cybernetic model of communication. “New materialisms” such as those more recently formulated by Karen Barad, Stacy Alaimo, Serenella Iovino, and Serpil Oppermann, among others, have theorized human minds and bodies as “transcorporeal” vectors (Alaimo 2010) in material relations that constitute the human subject through ecological networks. Jane Bennett’s new vitalism explores the vibrant agency of matter and its assemblages. Object-oriented ontology as proposed by Graham Harman, Levy Bryant, Quentin Meillassoux, and Timothy Morton

seeks to free objects from their “correlationism” to human agency and to explore them on their own terms, even though object-oriented ontology also emphasizes that objects will ultimately always remain withdrawn from human knowledge. Human-animal studies, elaborated by Peter Singer, Tom Regan, Jacques Derrida, Giorgio Agamben, Roberto Esposito, Donna Haraway, and Cary Wolfe, has focused on the philosophical underpinnings and political consequences of historically varying distinctions between human and animal. Recent work in plant studies by anthropologists Matthew Hall and Edward Kohn has begun to expand this argument into the domain of plants.

Some posthumanist theories focus on systems, some on machines, others on objects, and yet others on animals, and their foundational assumptions are in quite a few cases incompatible with each other. But in the discourse of the humanities and qualitative social sciences, including the study of culture from various disciplinary perspectives, they have collectively tended to exert a conceptual pull that contravenes the Anthropocene debates. Discussions about the Anthropocene have over the last decade often revolved around the question of human agency, specifically the question as to whether the emphasis on the human species as a whole masks continuing social and economic inequalities that distinguish those human populations who mostly cause climate change from those populations who suffer most of the consequences. Sociologists such as Jason Moore (2016), who has championed replacing the notion of the Anthropocene with that of the Capitalocene, and philosophers such as Slavoj Žižek (2011), who insists that capitalism continues to provide the key to solving the ecological crisis of climate change, have fiercely criticized the narrative of species-wide agency that has typically accompanied the Anthropocene. Posthumanist theories, by contrast, no matter what their specific assumptions might be, tend to converge in questioning the conceptual foundations for human agency, whether it is postulated at the level of the individual, the social class, or the species.

The study of culture is today caught up in the tension between the new emphasis on the centrality of human agency in the Anthropocene debates and its sustained questioning in theories of posthumanism. Julia Adeney Thomas’s work shows at least implicitly how the two might be connected to each other if the Anthropocene is understood as more than just climate change. The future study of cultures will need to be multiscalar, reconceptualizing cultural practices with different definitions of human collectivity in mind that range from the microscopic to the geological scale. And it will need to re-envision the human in a context of multispecies networks that take culture beyond the human. Several of the new areas of study that have emerged over the last two decades, including food studies, human-animal studies, and the environmental and medical

humanities, have begun to develop the concepts, methods, and tools for such a study of cultures across species.

3 Multispecies Cultures

In my rough-and-ready sketch of posthumanist theorists in the last section, I already mentioned human-animal studies or critical animal studies, as it is sometimes called. This field has its historical roots in the animal liberation movement as it was initiated by Peter Singer in the mid-1970s and developed by philosophers such as Tom Regan and Mary Midgley later on. Certain types of moral consideration that are usually only extended to humans, these philosophers argued, should also be applied to nonhuman species that share particular characteristics with humans, whether it be the ability to suffer or to function as the subject of one's own biography, for example. The debate over which kinds of moral consideration, including certain "rights," should be extended to which species, continues to this day. But in the 1990s, animal welfare thinkers and activists were sometimes criticized by theorists in the poststructuralist tradition – Jacques Derrida and Cary Wolfe, for example – for still privileging human subjectivity by considering only those animals as deserving of rights who shared certain characteristics with humans. The blurry boundary between humans and animals, they argued, should rather encourage us to take a critical look at the implied integrity and exceptionalism of human identity itself. "Critical" animal studies, then, tend to be skeptical of conventional beliefs about human identity, extending poststructuralist critiques of meaning and subjectivity into the consideration of biological species.

These debates are clearly crucial for the study of cultures, since they open up for analysis the way in which species boundaries have been historically and regionally variable, and how they have functioned to legitimate or criticize particular regimes of power. Giorgio Agamben has famously reminded us that biology's first modern taxonomist, Carl von Linné, who invented the binomial system of species designations, hesitated over how to classify humans in relation to other primates (Agamben 2004, 23–27). Cary Wolfe has argued that racism and other forms of social oppression are historically closely related to speciesism, which continues to underwrite social discrimination today (Wolfe 2003, 43). Graham Huggan and Helen Tiffin have explored how species distinctions function to legitimate colonial regimes by relegating colonial subjects to the less-than-human category of the animal (Huggan and Tiffin 2010, 18–19).

These explorations of the cultural and political work that the species concept does in different contexts and communities has in recent years been

complemented by two other strands of research. Anthropologists and philosophers such as Vinciane Despret, Eben Kirksey, Stefan Helmreich, Roberto Marchesini, and Anna Tsing have developed approaches variously called multispecies ethnography, etho-ethnology, or zooanthropology, which analyze what we normally understand as *human* societies and cultures as, in reality, assemblages of many species, ranging from the microbes inhabiting our gastro-intestinal tracts and disease-carrying viruses to food plants and animals, pets, and those plants and animals that figure in ritual and religious practices. Tsing has observed that “human nature is an interspecies relationship” (quoted in Kirksey, Schuetze, and Helmreich 2014, 2) in that human life is inconceivable without its dependence on a wide variety of bacteria, microbes, plants, and animals. On this basis, multispecies ethnography seeks to redefine what ‘the human’ means individually and collectively:

Ethnographers are now exploring how ‘the human’ has been formed and transformed amid encounters with multiple species of plants, animals, fungi, and microbes. Rather than simply celebrate multispecies mingling, ethnographers have begun to explore a central question: Who benefits, *cui bono*, when species meet? To answer this question, multispecies ethnographers are collaborating with artists and biological scientists to illuminate how diverse organisms are entangled in political, economic, and cultural systems.

(Kirksey, Schuetze, and Helmreich 2014, 1–2)

In this vein, Deborah Bird Rose (2011) has analyzed the relations between dogs, dingoes, and humans in Aboriginal and white Australian communities; Anna Lowenhaupt Tsing has investigated the cultivation, harvesting, distribution, and consumption of *matsutake* mushrooms in communities on several continents; and Thom van Dooren (2016) has explored processes that lead to species extinction and conservation efforts in different regions. My own recent work has focused on particular communities’ relationships to endangered or extinct species from the perspective of narrative analysis. Building on the work of multispecies ethnographers, I have suggested the concept of “multispecies justice” as a way of thinking together the concerns for environmental justice and biodiversity conservation (Heise 2016, 162–168).

In all of these case studies, the study of human cultures includes nonhuman species as a constitutive element without which the meaning of ‘culture’ itself could not be established. In future, such research projects may need to consider a different but related broadening of the culture concept that has come from ethology. The idea that animal communities themselves have cultures, in the sense of knowledge and skills that are transmitted from adults to juveniles not through genes but through learning, of locally specific practices by a population that is not shared by the species as a whole, and even of a sense of aesthetics, is no

longer new. Ornithologists and cetologists have for several decades documented the existence of “dialects” in the vocalizations of different populations of birds and whales, and such distinctive characteristics were also discovered in different whale populations’ foraging and migration traditions. Primates are by now well known for tool usage, complex social structures and relationships, and behaviors that would be difficult to call by any name other than politics, as Frans de Waal’s (1998) classic study of power relations among chimpanzees has shown. Richard Prum (2017), finally, has forcefully argued that a good deal of animal behavior cannot be explained without postulating a sense of aesthetics. In studies such as these, the concept of culture migrates beyond the human realm even as it sheds new light on human practices. The future of cultural studies, especially but not only if culture is envisioned from a multispecies perspective, will need to situate itself in this broadened context of cultural structures and practices that humans share with other animal species.

4 A “More Than Human” Future

I’d like to briefly explore this path forward for cultural studies through one suggestive example: music. Literature and art have engaged with multispecies communities and conflicts across a wide spectrum of genres and media. Animated films often feature a variety of speaking animals, sometimes in the absence of any human characters, as in *Bambi* (1942), and sometimes in conflict or collaboration with them, as in Isao Takahata’s *Pom Poko* (1994), Andrew Stanton’s *Finding Nemo* (2003), or Vincent Patar and Stéphane Aubier’s *Panique au village* (2009). Comic books, which have conventionally often featured animals that were simply humans in a more light-hearted guise, have over the last few decades metamorphosed into graphic novels with serious themes, complex plots, and three-dimensional characters. Some of them have addressed relations between different species in sophisticated ways, as Alan Moore’s reinvention of the *Swamp Thing* comic (1984), Grant Morrison’s reconceptualization of *Animal Man* (1988–1990), and the ongoing *Saga* series by Brian K. Vaughan and Fiona Staples (2012–) demonstrate. Short stories, novellas, and novels throughout the twentieth century have similarly engaged with questions of relations between species, from the critiques of domestication and captivity in works by Franz Kafka and Jack London to novels such as Bernard Werber’s trilogy *Les fourmis*, *Le jour des fourmis*, and *La révolution des fourmis* (1991, 1992, 1996) and Barbara Gowdy’s *The White Bone* (1999), which integrate scientific knowledge about the cognition, perception, and social behavior of nonhuman species such as ants and elephants

into fictional scenarios that reach beyond conventional realism to imagine new multispecies worlds.

But the translation of multispecies visions into aesthetic form does not occur only through image and text. Sound artists, too, have explored multispecies networks in innovative ways, by recording, recreating, or musically transforming the vocalizations of individual species, as well as entire natural soundscapes. Well known in this genre is Bernie Krause's *Wild Sanctuary Audio Archive*, first initiated in 1968, which includes "marine and terrestrial soundscapes representing the voices of living organisms from larvae to large mammals and the numerous tropical, temperate and Arctic biomes from which they come. [...] 4,500 hours of wild soundscapes and in excess of 15,000 identified life forms" (<http://www.wildsanctuary.com>). Krause's goals are mostly archival and documentary, but soundscapes also feature in works that are equal parts documentation and composition. The Spanish sound artist Francisco López' *La selva* (1997/2001), the American composer Steven Feld's *Rainforest Soundwalks* (2006), and the Italian composer David Monacchi's monumental project *Fragments of Extinction* (2001–2015) all combine sound recordings of multiple species in the natural world with original sound creations.

Monacchi's "environmental sound-art project" focuses, according to his own explanations, on the acoustic biodiversity of rainforests and seeks to collect "three-dimensional sound portraits of entire circadian cycles. The complex network of inter- and intra-specific communication found in these recordings is [...] *the sonic heritage of millions of years of evolution. We must save fragments of it in order to study, understand, experience, enjoy, and conserve it, preserving for future generations* imprints of the disappearing sonic intelligence of nature" (<http://www.fragmentsofextinction.org/mission/>; original emphasis). For fifteen years, Monacchi traveled to the Amazon, to the Congo, and to Borneo to record the sounds of intact equatorial rainforests. In the process, he developed innovative microphones and recording techniques to capture sounds from all the different levels and directions of a given rainforest location, as well as to withstand extreme humidity. Ecologists such as E. O. Wilson have argued that the current global biodiversity crisis eliminates species before humans have had a chance to find and name them. Monacchi, analogously, emphasizes that extinction silences natural voices and along with them entire "*eco-symphonies' we have not even heard or recorded*" (<http://www.fragmentsofextinction.org/mission/>; original emphasis). The soundscapes he focuses on have not been documented in their entirety, and they occasionally include individual voices that are unknown to current science.

Monacchi intends his sound art to communicate the beauty of the natural world to the audience, to influence public discourse, and thereby to support

conservation efforts. To this end, he creates continuous twenty-four-hour recordings of particular rainforest locations, which he then submits to meticulous analysis in terms of its spatial information, progressing moments in time, and occupied frequencies. For his performances, he condenses the twenty-four hours into ninety minutes and accompanies the recorded sounds with a sound spectrogram that translates the voices of different species into dynamically moving neon-colored lines, a visual spectacle with a distinctive aesthetic all its own. As part of his analysis during the performances, Monacchi includes the insights of acoustic ecology: the study of how individual species use particular niches of sound and frequency; how they adapt to different sonic environments; and how they work around cross-species similarities in calls and frequencies that impede territorial defense or mating. Just as topographical and climatic conditions, vegetation, and the presence or absence of other species open or foreclose particular possibilities for a species, in other words, so does the sonic environment, where certain frequencies and types of calls – acoustic niches – are occupied and others not.

Acoustic ecology also informs how Monacchi himself intervenes into his rainforest recordings. He manipulates existing sounds and adds others in what he calls “eco-acoustic composition” (<http://www.fragmentsofextinction.org/eco-acoustic-music/>), following the principles of acoustic ecology in that the human-generated sounds he adds to the soundscapes cannot overlap in time, location, frequency, or type with those of other species. Through this procedure, Monacchi goes beyond the documentary goal of registering nonhuman voices and ecologically significant silences. He adds a human presence to the ecosymphony, but meticulously respects the rules that also guide the sound behavior of other members of the multispecies rainforest community. The imagination that informs eco-acoustic composition is therefore, in the end, in equal parts nostalgic, technoscientific, and utopian, in that it technologically generates a sonic environment in which human voices are perfectly integrated with the species around them – presumably in contrast to the perceived separation of modern humans from nature.

Whether one agrees with this narrative about the reintegration of modern humans and nature through art that underwrites Monacchi’s compositions or not, his work highlights one of the many forms that multispecies approaches to the creation and interpretation of culture take today. From the perspective of multispecies theory, the cultural studies of the future would explore everyday cultural practices as well as works of art and literature as imbricated in networks that always reach beyond humans themselves to involve other species, often in locally or regionally distinctive ways. In some cases, this perspective may combine with the skepticism of humans’ singularity and exceptionality that characterizes posthumanist theories; in others, it may emphasize humans’ impact on the global environment in the

way debates about the Anthropocene do. But in either case, the future of cultural study will be, in David Abram's (1996) phrase, "more-than-human."

References

- Abram, David. *The Spell of the Sensuous: Perception and Language in a More-than-Human World*. New York: Pantheon, 1996.
- Ackerman, Diane. *The Human Age: The World Shaped by Us*. New York: Norton, 2014.
- Agamben, Giorgio. *The Open: Man and Animal*. Trans. Kevin Attell. Stanford: Stanford University Press, 2004.
- Alaimo, Stacy. *Bodily Natures: Science, Environment, and the Material Self*. Bloomington: Indiana University Press, 2010.
- Chakrabarty, Dipesh. "The Climate of History: Four Theses." *Critical Inquiry* 35 (2009): 197–222.
- Crutzen, Paul J. "Geology of Mankind." *Nature* 415 (2002): 23.
- Crutzen, Paul J., and Eugene F. Stoermer. "The 'Anthropocene.'" *Global Change Newsletter* 41 (2000): 17–18.
- De Waal, Frans. *Chimpanzee Politics: Power and Sex among Apes*. Rev. ed. Baltimore/London: Johns Hopkins University Press, 1998.
- Ellis, Erle C., and Navin Ramankutty. "Putting People in the Map: Anthropogenic Biomes of the World." *Frontiers in Ecology and the Environment* 6.8 (2008): 439–447. <https://esajournals.onlinelibrary.wiley.com/doi/epdf/10.1890/070062DOI10.1890/070062> [accessed: 27 June 2019].
- Fitzpatrick, Kathleen. "The Humanities, Done Digitally." *Chronicle of Higher Education* (8 May 2011). <https://www.chronicle.com/article/The-Humanities-Done-Digitally/127382> [accessed: 27 June 2019].
- Heise, Ursula K. *Imagining Extinction: The Cultural Meanings of Endangered Species*. Chicago: University of Chicago Press, 2016.
- Huggan, Graham, and Helen Tiffin. *Postcolonial Ecocriticism: Literature, Animals, Environment*. London: Routledge, 2010.
- Jamieson, Dale. "The Anthropocene: Love It or Leave It." *The Routledge Companion to the Environmental Humanities*. Eds. Ursula K. Heise, Jon Christensen, and Michelle Niemann. Abingdon: Routledge, 2017. 13–20.
- Kareiva, Peter, Sean Watts, Robert McDonald, and Tim Boucher. "Domesticated Nature: Shaping Landscapes and Ecosystems for Human Welfare." *Science* 316 (2007): 1866–1869.
- Kirksey, Eben, Craig Schuetze, and Stefan Helmreich. "Introduction: Tactics of Multispecies Ethnography." *The Multispecies Salon*. Ed. Eben Kirksey. Durham, NC/London: Duke University Press, 2014. Kindle edition.
- Krause, Bernie. *Wild Sanctuary*. <https://www.wildsanctuary.com/> [accessed: 27 June 2019].
- Marris, Emma. *Rambunctious Garden: Saving Nature in a Post-Wild World*. New York: Bloomsbury, 2011.
- Marris, Emma, Peter Kareiva, Joseph Mascaro, and Erle C. Ellis. "Hope in the Age of Man." *New York Times* (7 December 2011).
- McKibben, Bill. *The End of Nature*. New York: Anchor, 1989.

- Monacchi, David. *Fragments of Extinction*. 2001–2015. <http://www.fragmentsofextinction.org/> [accessed: 27 June 2019].
- Moore, Jason W., ed. *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism*. Oakland, CA: PM Press, 2016.
- Nordhaus, Ted, and Michael Shellenberger. “The Death of Environmentalism: Global Warming Politics in a Post-Environmental World.” 2004. <https://grist.org/article/doe-reprint/> [accessed: 27 June 2019].
- Nordhaus, Ted, and Michael Shellenberger. *Break Through: From the Death of Environmentalism to the Politics of Possibility*. Boston: Houghton Mifflin, 2007.
- Penley, Constance. “Brownian Motion: Women, Tactics, and Technology.” *Technoculture*. Eds. Constance Penley and Andrew Ross. Minneapolis: University of Minnesota Press, 1991. 135–162.
- Prum, Richard O. *The Evolution of Beauty: How Darwin’s Forgotten Theory of Mate Choice Shapes the Animal World – and Us*. New York: Doubleday, 2017.
- Radway, Janice. *Reading the Romance: Women, Patriarchy, and Popular Literature*. Chapel Hill, NC: University of North Carolina Press, 1984.
- Rose, Deborah Bird. *Wild Dog Dreaming: Love and Extinction*. Charlottesville: University of Virginia Press, 2011.
- Schwägerl, Christian. *Menschenzeit: Zerstören oder gestalten? Die entscheidende Epoche unseres Planeten*. Munich: Riemann, 2010.
- Thomas, Julia Adeney. “History and Biology in the Anthropocene: Problems of Scale, Problems of Value.” *American Historical Review* 119 (2014): 1587–1607.
- Tsing, Anna Lowenhaupt. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press, 2015.
- Dooren, Thom van. *Flight Ways: Life and Loss at the Edge of Extinction*. New York: Columbia University Press, 2016.
- Wolfe, Cary. *Animal Rites: American Culture, the Discourse of Species, and Posthumanist Theory*. Chicago: University of Chicago Press, 2003.
- Žižek, Slavoj. *Living in the End Times*. Rev. and updated ed. London/New York: Verso, 2011.