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Knowledge infrastructure and research agendas for quotidian Anthropocenes: Critical localism with planetary scope

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Abstract

The Anthropocene requires the development of new forms of knowledge and supporting sociotechnical infrastructure. While there have been calls for both interdisciplinary and community-engaged approaches, there remains a need to develop, test, and sustain modes of Anthropocene knowledge production that effectively link people working at different scales, in different sites, with many different types of expertise. In this *Perspectives* piece, we describe one such approach to Anthropocene knowledge production, centered in short-term Field Campuses that bring together community actors in cultural institutions, media, and government agencies with external academic researchers, bringing cultural analysis into the work of characterizing and responding to the Anthropocene. We argue that it is important to build public knowledge infrastructure that allows people to visualize and address many intersecting scales and systems (ecological, atmospheric, economic, technological, social, cultural, etc.) that shape the Anthropocene at the local level.

Keywords

collaboration, cultural analysis, field research, interdisciplinarity, knowledge infrastructure

Introduction

The knowledge challenge of the Anthropocene has many dimensions. It has long been recognized that interdisciplinary approaches—disrupting the "silos" in which many work—are important, and that integration of diverse data and knowledge forms is far from straightforward (Griggs et al., 2014; Nilsson et al., 2016; Szinai et al., 2020). It is also important to recognize that the human in the Anthropocene is not only in what people *do* but also in the frames relied on for sense-making and direction. Behavioral analysis is important but also insufficient. "Culture" understood in

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expansive, contemporary terms (Fischer, 2007, 2018) needs to be recognized as a driver of the Anthropocene, shaping the different ways Earth systems are perceived, interfaced, and changed. Overly generalizing approaches risk reproducing the same colonial logics and white supremacist ideologies that brought the Anthropocene into being (Gonzalez, 2020; Head, 2018; Instone and Taylor, 2015; Whyte, 2017). Cultural analysis and critique are thus an important part of Anthropocene knowledge production.

A different kind of challenge is in putting the Anthropocene in context in different settings, attentive to what social theorists Elinoff and Vaughan (2020) have called the "Quotidian Anthropocene." In *Disastrous Times: Beyond Environmental Crisis in Urbanizing Asia*, Elinoff, Vaughan and collaborators describe how differently positioned people in a wide diversity of settings (Beijing, where elite households use an array of technologies to monitor and filter dramatic air pollution; Bến Tre Province in the Mekong Delta of Southern Vietnam, known for progressive co-management of its fisheries; Bangkok in the aftermath of the 2011 Thai floods; the eastern coast coat of Sri Lanka in the long wake of a civil war and the 2004 Indian Ocean tsunami) have developed ways of understanding and responding to intensifying environmental volatility and vulnerability.[1] Importantly, "the Anthropocene" is considered emically—from the perspective of the people in varied local contexts, working through diverse cultural frames (Jardine, 2004); in many of the settings explicated in *Disastrous Times*, "the Anthropocene" is not referred to as such but in more locally situated terms. Elinoff and Vaughan's conceptualization of the Quotidian Anthropocene thus does double work: it focuses attention on ways planetary dynamics are having effects and being understood and addressed at the local level; it also demonstrates the value of understanding "the Anthropocene" from diverse vantage points, recognizing the insights of different social actors (including but not limited to scientists and engineers) and the analytic power of theory development outside Euro-American frames.[2]

Thinking in terms of quotidian Anthropocenes brings local and planetary dynamics together, drawing out how differently situated people are experiencing, understanding, and responding to the singular Anthropocene (sometimes known by other names) in different settings. This approach responds to a persistent critique of the Anthropocene concept for being overly universalizing and discounting the formative role of colonialism, capital, extractive labor, and deep social and racial inequality (Davis and Todd, 2017; Haraway, 2015; Moore, 2016; Saldanha, 2020; Vergés, 2017; Yusoff, 2019). It also brings culture into Anthropocene analyses.

"Culture" can be understood as the way attention is focused and delimited, bringing some things and relationships into the foreground while occluding others, bringing particular historical perspectives to bear. Particular places are often thought of as having particular cultures habits of mind that characterize them but a more complex approach is called for, recognizing that habits of mind are always changing and multiple, shaped by landscapes, built environments, educational systems, data infrastructure, and a host of other factors. Culture operates through the ways diverse people experience and perceive the world and design systems to understand, engineer, and govern it, in turn creating new conditions in which human perception, activity, and potential takes shape. Culture is fundamentally iterative, circulating back to shape what shapes it.

Following from this understanding of how the Anthropocene and culture entwine, we have worked to draw out deep histories of specific places, bringing together diverse, often contradictory voices. Long standing disputes over land and labor have been made visible via this approach, along with power inequities and struggles for justice. We also want to understand how experts in different fields civil engineering, public health, law, and literature see a place, its problems and possibilities. Disasters play out in slow, disjunctive motion in these places. Our work is to excavate these slow (punctuated by fast) disasters, drawing out how they compound (Fortun et al., 2017; Knowles and Loeb, 2021). Our focus is on *Anthropocenics* the dynamic interactions between scales (local to planetary) and systems (ecological, atmospheric, technological, economic, social, cultural, and so

on) that produce the Anthropocene at the local level. Our analyses include examination of the many factors that shape people's understanding of the local environmental conditions while also examining how these understandings are reshaping the very dynamics from which they emerge.

Our goal in the project described here the Quotidian Anthropocenes Project is to build and sustain an approach to interdisciplinary Anthropocene knowledge production that links universities, cultural institutions and diverse local experts in productive ways, bringing cultural analysis into the work of characterizing and responding to the Anthropocene. Cultural institutions include museums, memorials, libraries, community centers, indigenous-led organizations, and other entities committed to the production, presentation, and dissemination of knowledge that animates public reflection and problem solving. The work of cultural institutions is always selective and interpretive; they have to choose and craft their messages; they make the histories and heritages they present. The public histories created and replayed in cultural institutions are, of course, always delimited, and in some cases can be emphatically exclusionary and counterfactual (Burns, 2013; Loewen, 2007; Stanton, 2006; Wilson, 2012, 2016). At their best, cultural institutions are creatively progressive, pushing against habitual renderings and exclusions that characterize colonial, white-supremacist, technocratic and economistic thought, provoking new imaginations and possibilities for inclusive prosperity. A key tactic of the Quotidian Anthropocenes Project is to partner with such institutions, scaffolding without dominating their work, helping bring in new voices and layers of analysis, tuning public knowledge to both local and planetary dynamics.

The Quotidian Anthropocenes Project has included many partners. The phase of the project described here was done in association with the Anthropocene Curriculum jointly run by the Haus der Kulturen der Welt and the Max Planck Institute for the History of Science in Berlin. It is an experimental project that links academic researchers to local cultural institutions and local experts, in turn bringing diverse sites of the Anthropocene into university teaching, aiming to cultivate next-generation Anthropocene actors. The project is on going and continues to be refined. We remain open to feedback and collaboration, and encourage further experimentation in this vein. The Anthropocene calls for this kind of effort, turning universities into creative animators of new knowledge beyond their walls.

Quotidian Anthropocene field campuses

Since 2013, the Haus der Kulturen der Welt's Anthropocene Curriculum has brought together researchers from around the world, from many disciplines, to think through the Anthropocene, its intellectual demands, and the new knowledge practices and infrastructure it calls for. Its 2019 *Misissippi. An Anthropocene River* project extended from this, using the river to bring together diversely focused research groups, all with community ties. The role of the *River School* was to connect these groups and sites, creating space to share approaches and findings, and to consider how different sites of the Anthropocene could be productively engaged in tandem—drawing out the particularities of each site while also developing locally informed theoretical perspectives on the Anthropocene. The authors of this article here created and ran the River School, envisioning it as an opportunity to develop a research process and supporting infrastructure responsive to the knowledge challenges posed by the Anthropocene (Ludwig et al., 2019).

The River School included work in a virtual research environment customized for the project[3] and a series of Field Campuses, short (4-day), intensive field research stints involving approximately twenty external researchers interacting with diverse local experts and cultural institutions. Prior to a Field Campus, project participants worked virtually to begin site characterization, drawing in their prior research experience. The analytic framework that scaffolded the collaboration, bringing many scales and systems into view, is shown in Figure 1.

QUOTIDIAN ANTHROPOCENE ANALYTIC FRAMEWORK

DEUTERO: What capacity (and incapacity) is there to recognize and attend to "the Anthropocene" in this setting? How might academic projects contribute to or scaffold this capacity?

META: How are anthropocenics in this setting described and narrated by different organizations and social groups? What do accounts include and what do they leave out? What discursive histories shape contemporary articulations? Where are there discursive risks?

MACRO: What economic and military activities have contributed to anthropocenics in this setting? What dispossessions Indigenous and Black, formal and informal were foundational? What laws and policies have addressed anthropocenics? How are future economies imagined and planned?

MESO: Who are stakeholders in this quotidian Anthropocene and how do they relate to each other? Who holds power and how is it wielded? What forms of political organization have emerged to address and weather the Anthropocene?

MICRO: What practices (in industry, the military, in homes, and in play) have produced this quotidian Anthropocene? What remediation and adaptation practices (flood management, soil removal, etc.) have anthropocenics provoked?

NANO: What has shaped the way people frame and see this setting? What do people fail to see? How do people in this setting see other people? What social and knowledge hierarchies are in play?

BIO: How are bodies in this setting laced and burdened with anthropocenics? What occupational hazards haunt this setting, past and present? Who are vulnerable groups? How are anthropocenic bodies racialized bodies?

EXDU: What educational programs in this setting in primary and secondary schools, vocational schools, trade unions, universities, etc. are addressing anthropocenics? What expert communities are involved in characterizing and stewarding this quotidian Anthropocene? How are Indigenous knowledges mobilized or discounted?

DATA: What knowledge infrastructure supports recognition, characterization and response to anthropocenics in this setting? Who has access to relevant data and sense-making tools? Who does the knowledge infrastructure serve, discount or criminalize? What knowledge infrastructure and archiving capacity is needed going forward?

TECHNO: What industries and infrastructure have produced anthropocenics in this setting? How has this landscape been engineered?

ECO: What ecosystems in this setting are depended on, protected, or compromised, and how is this recognized (or not)?

GEO: What geologic formations characterize this setting? How has intensive human activity marked, transmuted, destabilized and harmed this setting? How are global warming and other atmospheric currents stressing local landscapes and complicating Anthropocene stewardship?

Figure 1. The analytic framework used to visualize multiple scales and systems in play in local instantiations of the Anthropocene. The digital research environment built to support the Quotidian Anthropocene project allows project participants to work together to respond to the questions, encouraging the integration of perspectives across discipline, generations and from multiple geopolitical standpoints within and beyond the university.[4]

Figure 2. Quotidian Anthropocene Field Campus group walking up the US Department of Energy's Weldon Springs Containment Cell in St. Louis. Photo by Tim Schütz, March 2019.

Focusing on manifestations of the Anthropocene along the Mississippi River drew our attention to the power and formative influence of the river itself and the expansive, volatile, mineral and soil-rich delta around it. It also foregrounded the lasting effects of Indigenous and Black dispossession in the United States in the Mississippi River region and far beyond. The Lewis and Clark Expedition (1804–1806) infamous for "opening the American West" began with a crossing of the Mississippi River in St. Louis after the Louisiana Purchase was signed in New Orleans (where the River meets the Gulf of Mexico). In the process, intricately organized and technically advanced Indigenous societies were removed, decimated and discounted. The Mississippi River basin is also deeply imprinted by slavery, and has been a central artery for "slavery by another name" via sharecropping, low-wage labor, and imprisonment (Blackmon, 2009). Today, chemical plants that produce staggering environmental injustice in Louisiana operate on the literal footprints of plantations once powered by enslaved people (see, e.g. Davies, 2017).

Our challenge in convening the River School and Quotidian Anthropocene Field Campus was to bring these entangled histories into the present, analyzing and interpreting them from multiple vantage points, turning from them to think about what "just transitions" will entail (Adams and Fortun, 2021).

In March 2019, we ran a Field Campus in St. Louis, Missouri, a city some say is an epicenter of racial capitalism (Johnson, 2020; Gordon, 2019). An important, foundational stop was Cahokia Mounds, once (circa 1100) the largest city north of Mexico and the center of a vibrant trading network that linked Indigenous societies across much of North America (Richter, 2011). The site was abandoned by around 1400 but recent research (making creative use of lake sediment samples) shows that the region was repopulated quickly, with a more distributed social organization like that of the Illinois Confederation (Anwar, 2020). The lead author, A. J. White, explains that "the study takes on the "myth of the vanishing Indian" that favors decline and disappearance over Native American resilience and persistence" (White, 2020). White follows many scientists today in recognizing the cultural import of their study designs and the future implications of the scientific stories

they tell. This is an important point to address in all the Field Campuses that we run. In order to understand the Anthropocene in context, especially in the United States, it's essential to focus attention at sites where European colonization and Indigenous dispossession were such driving forces (Davis and Todd, 2017; Whyte, 2017) creating nearly immediate, catastrophic change (including such staggering human death that it altered atmospheric processes), in turn laying ground for the "Great Acceleration" of the 20th century (marked by intensifying mining, use of fossil fuels and industrial chemicals, circulations of airborne radioactivity from bomb testing, etc.).[5] It wasn't our task to define the Anthropocene or its start date in geomorphic terms. Instead, we worked to develop a method and research process for understanding the Anthropocene in very local terms while drawing relation to the in a planetary frame.

Our primary focus in St. Louis was on contamination from atomic bomb production in the 1940s and 1950s. We visited environmental remediation sites and spoke to people involved in the clean-up. We also toured the Weldon Spring nuclear waste disposal site and interpretive center (run by the US Department of Energy; see Figure 2), asking questions about the (im) possibilities of environmental stewardship when such contamination will persist for 1000s of years. A key local expert was Tony West, director of the documentary film *The Safe Side of the Fence*, which tells the story of civilian nuclear workers and their struggles to be recognized as harmed by radiation exposures.[6] We were hosted by Granite City Art and Design District (G-CADD) (2020), in a neighborhood once lively with workers at a nearby steel plant, lead smelter, and armory. In 1903, Granite City expelled Black workers and was later known as a "sundown town," which African Americans had to exit before dark (Loewen, 2007). Today, the neighborhood looks like so many nearly abandoned, post-industrial sites around the United States; industry lives on in the soil, however. A vacant lot near G-CADD has been turned into a "lead garden" to mark this legacy.

The St. Louis Field Campus made many things visible: We found that residents and workers often learn about contamination long after the fact, often through extended local activism and media creativity (three films about St. Louis' nuclear legacy released between 2015 and 2017 helped surface the issue, along with sustained organizing by community groups and labor unions: The SafeSide of the Fence, 2015; First Secret City, 2017; Atomic Homefront, 2017). We learned that laws designed to redress problems of the Anthropocene (radiation and contamination of land and bodies, e.g.) are often unknown or dormant, requiring activation by figures like Denise Brock, whose parents worked in the St. Louis plant that processed uranium for atomic bombs. After years of effort on her father's case (leveraging the US Freedom of Information Act), Brock is now an ombudsman for the US Department of Labor, helping workers from sites across the United States access the US Energy Employees Occupational Illness and Compensation Program. We also learned that cultural institutions like the US Department of Energy's Weldon Spring Interpretive Center in St. Louis, which sits alongside a 75-foot-high containment of nuclear waste (Figure 1) can make the enduring hazards of the Anthropocene visible while also presenting them as something contained and controlled. In so doing, such institutions seem to miss the dynamics and volatility of the Anthropocene, such as the ways that the extreme weather resulting from climate change may threaten many nuclear waste disposal sites, for example. Perhaps most fundamentally, we observed how the problems of the Anthropocene continue to be siloed, such that work to address radiation contamination remains largely disconnected from efforts to address the lead contamination of soils with lead, for example. This in turn foregrounds a need for new knowledge infrastructure for archiving, sharing, interpreting and mobilizing the many kinds of data (old and new) needed to help characterize quotidian Anthropocenes, connecting issues and people within and across sites.

In September 2019, we ran a Field Campus in New Orleans focused especially on connections between the old, slavery-driven plantation economy and the region's petrochemical industry. A key debate in the region involves the siting of new chemical plants in communities that already have an exceptionally high pollution burden as a result of extant industrial infrastructure. Investment in these new plants has resulted from the largely unregulated natural gas boom in the United States a boom in which the tight interlacing of technology, geology, and political economy is especially apparent. Activists leading opposition to a new Formosa Plastics facility in the region were among the experts that Field Campus participants interfaced with directly.[7] We also partnered with the Whitney Plantation Museum, which shares the story of the region from the perspective of enslaved people.

Here, too, many elements and dynamics of quotidian Anthropocenes were made visible. There is still work to be done connecting historic harms (slavery) to contemporary harms (from the petrochemical industry), drawing out historic production of disadvantage, anticipating ways documentation of cumulative harms can be mobilized—as evidence of human rights violations, for example, and to resist the expansion of harmful operations in sites of quotidian Anthropocenes (Dermansky, 2021). There is also work to be done connecting sites of the quotidian Anthropocene because they contend with the same multinational corporation Formosa Plastics, for example, a vertically integrated Taiwanese petrochemical company with facilities in Taiwan, China, Vietnam, and the United States. Formosa has plans for a new multi-billion-dollar chemical manufacturing complex in St. James Parish, Louisiana, an area already known as "Cancer Alley," which we visited during our Field Campus (Steininger, 2021).

Our goal in these Field Campuses was to (rapidly and partially) understand St. Louis and New Orleans as sites of the quotidian Anthropocene, and as before, in the process we developed developing a re-usable analytic framework and workflow for collaborative cultural analysis of different quotidian Anthropocenes. Importantly, our analysis worked to draw out the formative force of many systems ecological, atmospheric, technological, economic, political, social, cultural and so on while also accounting for the formative force of ways these systems are perceived. Our analysis was also meant to be deeply historical, accounting for ways foundational dispossession of Indigenous lands and Black labor, most significantly set the stage for how the Anthropocene plays out today.

In talking with people and listening to the narratives presented in St. Louis and New Orleans, our aims were multifold. We wanted to draw into visibility and characterize different ways of understanding the history and challenges of these places, explicating underlying assumptions, what *wasn't* narrated, and implied directions forward (Longino, 2013; White, 1973). We wanted to understand how the many scales and systems implicated in the Anthropocene were addressed, or not, and how cultural analysts could possibly supplement local narratives.

Our approach extends from work in cultural anthropology (especially intensive since the late 1980s) to update conceptualization of anthropological field "sites" to address their emplacement in both history and global systems (Appadurai, 1997; Gupta and Ferguson, 1992; Marcus, 1995; Marcus and Fischer, 1986; Tsing, 2004). One challenge of Anthropocene analysis is to add planetary dynamics to the mix.

We also work at the nexus of anthropology and the interdisciplinary field of science and technology studies (STS), extending a rich body of research on different forms of expertise, thought styles and epistemic cultures, and what they privilege, discount, draw into relation and side-line (Fleck, 1981 [1935]; Fortun and Fortun, 2005; Knorr-Cetina, 1999; Knowles, 2013; Longino, 2013; Perin, 2005). This body of research draws out and recognizes the value of explanatory pluralism. It also recognizes ways experts' understanding of the systems they build and manage shapes, without fully controlling, their operation; this profoundly challenges the management and

governance of many types of systems because it situates experts within the systems they work on rather than at an objective and control-oriented distance (Bateson, 1972). The resulting challenges are especially acute when dealing with complex, tightly coupled systems that routinely run beyond conventional logics and expert control. Sociologist Charles Perrow famously characterized such systems as primed for "normal accidents" routine, often very injurious dysfunction. Perrow's analysis focused on tightly coupled sociotechnical systems, such as nuclear plants and air traffic control systems, for example (Perrow, 1999 [1984]). The Anthropocene, with its intricate, entangled couplings of multiple systems, involves even greater complexity and its potential for wide-spread harm. Concern with this complexity and potential for run-away dysfunction drives the Quotidian Anthropocene Project and our sense of the need not only for more knowledge but also for new knowledge relations and forms.

Characterizing sites of the quotidian Anthropocene and their dysfunctions is not our end goal. We also hope to help build capacity to *govern* quotidian Anthropocenes over the longue durée cognizant of the heavy weight of colonial and racial capitalist histories, the complex interactions productive of the present, and demands for more just futures.[8] The experimental, collaborative methods used in the Quotidian Anthropocenes Project were developed with these legacies in mind. Our aim is to develop ways to characterize sites that share responsibility across time, scale and systems.[9]

Work behind and ahead

We have come away from Field Campuses thus far humbled by the challenge of characterizing quotidian Anthropocenes. We also deepened our understanding of the new knowledge practices, relations, infrastructures and forms that the Anthropocene calls for. Collaborative knowledge production across borders, disciplines and types of expertise is clearly needed. Academic researchers need to learn to listen to community experts while also bringing in other forms of expertise. Academic researchers can also help build capacity for community knowledge production, helping community actors see and share what they know, helping them see the questions that their knowledge answers.

Academic researchers can also begin to build data infrastructure that will be needed to steward the Anthropocene, linking people, issues, and places. We've thought of this as "archiving for the Anthropocene" (Schütz, 2019). Some of the work will be in data infrastructure design, creating indexes and standard vocabularies that will make diverse data discoverable and accessible. Some of the work will also be in workflows that encourage movement through many different framings of sites, problems and possible ways forward. Quotidian Anthropocene Field Campuses model one approach.

We situate the work described here in a long history of effort to build public knowledge infrastructure involving diverse stakeholders,[10] aware of ways in which historically entrenched social and racial hierarchies trouble the democratizing promise of such infrastructure. The work must therefore involve active push-back against knowledge imperialism, epistemic exclusion, and cooptive modes of collaboration—within and among universities, and in their relationships beyond their borders (Alatas, 2000; Bhambra et al., 2018; Bhargava, 2013; Biesta, 2007; Cervone, 2015; Fricker, 2017; Harney and Moten, 2013; Ogone, 2017; Paasi, 2015; Pitts, 2017). There are shoulders to stand on, organizational models to borrow and tactics to be exchanged. Recall, for example, the Freedom Schools that helped carry the US civil rights movement (partly by teaching students to ask new questions about their local environments), Europe's science shops (that linked universities to communities for collaborative work on community problems), India's people's science movement, East Africa's critical literary movement in the 1960s and 1970s (which argued for the

abolition of English departments to make way for locally rooted ways of thinking and writing) (Gikandi and Mwangi, 2007; Musila, 2019), and rich traditions of community-based research in settings around the world.

Though its colonial roots (Whyte, 2017) and conceptual history (Davis, 2011) are centuries old, the Anthropocene poses new challenges, partly because of rapid intensification of global warming and its cascading, cross-system, cross-scale effects. Conditions are complicated, volatile, and learning across sites is both more difficult and ever more critical. Critical localism and globalism must be combined (Coronil, 1997), in a planetary frame. The work is both enabled and constrained by highly developed forms of expertise in many different relevant fields. Such expertise is desperately needed but it is also at risk of approaching emerging problems through obsolete and problematic frames (Fortun, 2012; Simpson, 2020). This makes the need for cultural analysis *within* the knowledge formations of the Anthropocene critically important. Cultural analysis draws such frames into visibility, opening possibilities for collaboration and critical reflection and revision.

There will, inevitably, be much "muddling through," given that we can't yet envision either the organizational or knowledge forms the Anthropocene calls for (Fortun and Bernstein, 1998; Rodgers, 2015). The ship will have to be built as we sail it, so to speak with new designs and directions. The Anthropocene is like the waves beneath the ship; the churn will be constant and we know there are many storms ahead. The idea of weathering the storm thus takes on new meaning, becoming a constant rather than concern about a discrete event. We argue here that this calls for new knowledge practices, relations, forms and infrastructures, and that there is important work to be done between universities, cultural institutions, and local experts. We encourage many experiments in this direction. We also argue for recognition of the significance of culture and cultural analysis within the Anthropocene, seeing them not only as critical elements of the Anthropocene but also as tactical means to activate the new relations across systems, scales, discipline, geopolitics, and generations that the Anthropocene calls for.

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Notes

1. In referring to the "Quotidian Anthropocene," we want to convey how focusing on contextual and cultural variation has long been central to anthropology and cultural analysis writ large, and that this is something cultural analysts bring to Anthropocene analysis contributing both general and highly contextualized insight. The "Quotidian Anthropocene," as we understand it, is useful to think of as analogous to conceptions of local modernities (Hefner, 1998; Ramos, 2001; Takeuchi, 2005b), biologies (Brotherton and Nguyen, 2013; Lock and Kaufert, 2001; Yates-Doerr, 2017), sciences (Traweek, 1988; Verran, 2001); and fascisms (Nelson et al., 2021), for example.
2. Elinoff and Vaughan work within an important line of work that considers "Asia as Method" (Chen, 2010, 2012; Takeuchi, 2005a), which in turn contributes to a more general body of work on the epistemic value of situated, peripheral and heterodox knowledges (Comaroff and Comaroff, 2012; Haraway,1988;

Law, 2011; Kirsch, 2006). Elinoff and Vaughan's (2020) edited volume also extends a rich body of work on environmental knowledge, environmentalisms and the Anthropocene in Asia (see, e.g. Haddad, 2021; Jobin, 2021; Hudson, 2014).

3. See https://disaster-sts-network.org/content/quotidian-anthropocene/essay.
4. This cross-scale and system analytic framework to draw out anthropocenics in diverse local contexts extends from arguments about the character (and cross-scale, cross-systems dynamics) of "late industrialism" what industrialism has become as it has cohered, aged, ossified, degraded and retrenched over time (Ahmann and Kenner, 2020; Fortun, 2012, 2014). This cross-scale, cross-system approach can be adapted and elaborated to draw out many different phenomena energy transition or environmental data capacity, for example with many constitutive elements and dynamics, drawing out cross scale and system interactions, the contradictions produced by these interactions, and resulting intensification.
5. Plant ecologist Simon Lewis and Earth scientist Mark Maslin provide a compelling description of catastrophic cascades of events that followed European colonization of the Americans, arguing that it is the beginning of what should be recognized as the Anthropocene because of both geophysical evidence and how it allocates responsibility and what it means for the future. The details they provide are worth revisiting (Lewis and Maslin, 2015).
6. We have sustained relations with Tony West through his involvement in a symposium commemorating the tenth anniversary of the Fukushima disaster, Envisioning Next Generation Radiation Governance. See https://disaster-sts-network.org/content/next-generation-radiation-governance.
7. We have continued our work near New Orleans, in Louisiana's "Cancer Alley" through partnerships with the Whitney Plantation Museum and local environmental groups. One product of this work is a virtual tour, *Sugar Plantations, Chemical Plants, COVID-19 (https://disaster-sts-network.org/content/sugar-plantations-chemical-plants-covid-19)*, designed to introduce university students to Cancer Alley. Another ongoing project from the New Orleans Field Campus is the Formosa Plastics Global Archive, designed to connect environmental activists at sites in Louisiana, Texas, Vietnam and Taiwan where there are Formosa Plastics facilities. See https://disaster-sts-network.org/content/formosa-plastics-global-archive
8. The concept of the "longue durée" comes from the work of French historian Fernand Braudel and the *Annales* School, which he helped establish. It refers to a mode of historiography that weaves historical climatology, geology, and other planetary forces into historical description, recognizing the effects of processes that are so slow as to be imperceptible to those living within them.
9. Politically, this includes refusal to abandon sites as sacrifice zones, actively drawing such zones into view and collective stewardship. This calls for new relationships between universities and communities, and for university teaching that draws students into the effort. Toward this, the work of the Quotidian Anthropocene project includes an extensive pedagogical dimension, including the undergraduate course "Environmental Injustice," designed to be taught on multiple campuses. In this course, students do community focused research on environmental hazards, learning to work together to understand the many scales and systems imbricated in the production of environmental vulnerabilities and harms at the local level.
10. See, for example, this history of "science shops" in Europe: https://www.livingknowledge.org/science-shops/about-science-shops/history-of-science-shops/

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