

REVIEW

How do environments come to matter?

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Refining Expertise: How Responsible Engineers Subvert Environmental Justice Challenges, by G. Ottinger, New York and London: New York University Press, 2013. 221 Pages.

How Climate Change Comes to Matter: The Communal Life of Facts, by C. Callison, Durham and London: Duke University Press, 2014. 316 Pages.

Introduction

Environments seem to matter in many ways, as resources, as constraints, as enablers, and in complex ambivalence and entanglements. But how do they come to matter? Is “the environment” merely a cosmic signifier, an issue of semiotics? Contesting whether and how environments matter has been going on all along, including not least in Carson’s (1962) *Silent Spring*, which is a popular cultural reference point, and in the seemingly quite forgotten *The Condition of the Working Class in England* (1969) by Friedrich Engels (see Clark and Foster 2006). A reference to Trump’s early 2017 moves towards dismantling the *Environmental Protection Agency* serves then to underline the ongoingness of contesting natures, environments and how they matter.

I take the stance that environments have been mattering for humans all along. A universalising claim; but environments, and the use of specific environmental matters, matter even to shape the string that forms carrier bags, for herbs and for stories. Academic seeds, too, require environments in which they can travel, books and logistic giants, or tablet computers and electricity infrastructures implicating environmental struggles over electronic waste, emissions from Amazon delivery, etc. At the same time these environments shape what they contain, reconfigure its internal relations and reality effects. That and how environments matter is not merely an environmentalist issue; James Cameron’s 2009 blockbuster *Avatar* tells so, too. To make environments matter not only materially but also politically we may not even need stories containing white male heroes, so vividly figured in Ursula Le Guin’s *The Word for World is Forest* (1972/2010). Politically struggling over natures and environments, I read *Staying with the Trouble* by Donna Haraway (2016) as indicating how her earlier work can be drawn on to trouble stories of the hero, Anthropos, as the centre or even as the singular focus of environmental

storytelling. The environment is not merely about humans and their meaning-making. From a different vantage point, Bruno Latour's (2004a) *Politics of Nature* undermines, too, the possibility to think nature and society as intrinsically apart; and Noortje Marres traces publics, material mattering and environments in her *Material Participation* (2012). The last two years crystallised Haraway's *Chthulucene*, an unruly Gaia by Isabelle Stengers (2015), and Anna L. Tsing's analysis *On the Possibility of Life in Capitalist Ruins* (2015), which I project into this analytical space of environmental STS. Here we encounter calls to study capitalism without assuming progress and profit, calls to engage with the intrusion of Gaia. My reference to Gaia foregrounds environmental reality as not subject to human mastery but as an effect of the located interactions between organic and inorganic agents across the planet.ⁱ In short, for environmental STS—an STS that engages with environmental reality-making—in this decade, it should be quite straight forward to invite environments as mattering materially as well as in unruly ways into our storytelling.

Considering this public conversation and these well-articulated calls when encountering Gwen Ottinger's (2013) as well as Candis Callison's (2014) monographs may superficially generate some optimism. Ottinger leads the reader into the midst of petrol capitalism which Stengers (2015), alongside many others, struggles with. Ottinger follows and troubles actors who "have to" green capitalism and who may not feel much troubled by it. Neither appear to be troubled those actors followed by Callison—Arctic indigenous representatives, corporate social responsibility agents, American evangelical Christians, science journalists, science and science policy experts. With her study, it seems the reader learns about a capitalism in which profit and progress do not matter, indeed, where actors seem to seek "collaborative survival" (Tsing 2015) whilst facing climate change.

Both monographs engage with well-intentioned actors who engage with the effects of emissions, and these books address how emissions (greenhouse gases and others) affect groups differently: how US-American actors or communities translate environments into their life- or work-worlds. Given that neither of these books share much of the vocabulary of Haraway, Tsing, or Stengers, it seems apt to engage with the books' own phrases. Borrowing Callison's phrasing, I turn to considering how environments "come to matter" differently in Ottinger's and Callison's approaches. As I'll suggest, a key question in this consideration is how the matter of environments matters, an issue significant to whether climate change is about an intruding Gaia or about "the play of signifiers in a cosmic force field" (Haraway 1988:577).

I shall argue that Ottinger's and Callison's approaches are strikingly, though very implicitly, different. To develop this argument, I first present the books and discuss how environments come to matter in their accounts. Second, I compare how their different takes on mattering problematise a shared core subject of their books—the discourse of public

understanding of science (PUS). In closing, I turn to how their alternative analytics generate different understandings of environmental agents.

Situated tactics and strategies in neoliberal matterings of the environment

Refining Expertise is an ethnography of the interactions within and between oil refinery environmental agents (engineers, scientists, managers) and the communities neighbouring the refinery industrial sites. Ottinger takes the reader to two towns near New Orleans (Louisiana), New Sarpy and Norco. In her account, she comparatively analyses how the impact of the refineries on the neighbouring communities have been contested and negotiated. Of immediate STS interest in this analysis are her concern with industry scientists, environmental technology, and the effects on health and environment of modern fossil technology on the one hand, and on the other hand with neighbourhood community members' knowledge of, and sensory engagement with, their environment and their own bodies, as well as Ottinger's interest in citizen science and activism.

At the centre, I note her question "How did refinery scientists and engineers reestablish themselves as *the* legitimate, credible sources of technical information?" (22). It is the re-establishment aspect that turns her book into an exciting read: She sets out from a situation in which neighborhood activists managed to use buckets with samples of air as well as their own bodies to effectively challenge refinery knowledge and management. Yet, the story turns, as the neighborhoods eventually agree to compromises with industry that deny recognising "non-expert" pollution and health knowledges. Ottinger's analysis argues that we can aptly understand this turn by locating petrochemical industry scientists and engineers in a "neoliberal terrain" that is both context and resource for the corporate agents. Within this terrain, she shows, they are able to silence neighbors' critique or translate critique into discursive openings within which they can perform expertise, allowing the corporate agents to gain, rather than lose, authority in the interaction with neighbors, making environmental contamination more and democratic participation less likely.

In my reading of *Refining Expertise*, then, environments come to matter in always specific material-discursive configurations of human bodies, words, material devices and organisations. Her analysis accounts for diverse and heterogeneous configurations of environments. To illustrate this, consider the matter of a bucket, a bag of air (pollution from Norco) travelling alongside an activist to a United Nations conference on Climate Change, entangled on the one hand with a Shell Chemical presentation and on the other hand with sponsoring by the "critical" NGO Corporate Watchⁱⁱ (12-14). Simultaneously, her analysis engages with material-discursive formations like a "dialogue" between industry and town communities that frames state authorities

not as regulators but as facilitators between partners, staged as equals, and in which “neutral” scientific reports are allowed to inform community whilst engaged scientists are excluded.

Ottinger’s implicit sensibility to both, the materiality and semiosis, lets the reader develop a nuanced understanding of the limitations of the practice of corporate social responsibility and of corporate commitments to sustainable development: the play and struggle with words of greening is significantly confined by the specific relations between meaning-making and, e.g., human bodies (which sense environments), machinic sensors, timing and placing the latter, bits of dirt, the characteristics of air and air-borne substances, the physical layout of meeting rooms and the inclusion and exclusion of particular embodied people into discourse and meeting rooms. In this embodied and material analytics, meaning does not appear as relative but as an effect of, what John Law called, heterogeneous engineering. As I read it, *Refining Expertise*, deals with the enrolment of discursive, institutional and material resources in situated tactics and strategies.

Making climate change mean something (different)

How Climate Change Comes to Matter, in contrast, takes the reader to five discursive expert communities—Arctic indigenous representatives, corporate social responsibility actors, evangelical Christians, science journalists as well as science (and science policy) experts. In relation to each of these communities, Callison sets out with two questions: (a) how these communities relate to climate science and climate change as a fact and (b) how they attempt to make climate change “more” (2) than a fact, rendering the fact meaningful for their discursive constituencies, seeking to make the constituencies care for climate change. Her notion of “matter” references this second question: she is interested in how these communities (attempt to) achieve that their constituencies regard climate change as relevant to individually and collectively engage with. “Mattering”, in this study, is analysed with respect to meaning-making, semiosis.

Thus, the monograph poses the question of “how groups come to recognise the need to address climate change from their own ethical and moral reference points and establish other logics and baselines that come alongside scientific evidence” (32). The intended STS contribution of Callison’s study is to clarify that it is not more information that is needed for public engagement with complex scientific issues like climate change, but that climate change information needs to be linked to what people already care about.

Callison treats these expert communities to a large degree in isolation from each other, each in a separate chapter. Her methodology is enriched, however, by letting each ethnographic experience with a respective group inform her sensibilities when analysing all the five communities. Two communities break the isolating pattern: (a) climate change scientists and experts offer factual reference points across the complete book; (b) and (science) journalists and

their translations of climate change are relevant to her engagement with all the communities. In my reading, it is with respect to the latter group that the book may establish its most significant contribution. By studying how climate change media coverage emerges, how it is contested and how it comforts or irritates communities, *How Climate Change Comes to Matter* offers scholars interested in media translations of climate change a helpful treatment of the relations between science, media, journalists, traditional norms of how the latter ought to relate to science and reality (and challenges to these norms), the shifting economic and technical infrastructures of media, as well as the content shaping and shaped by these relations.

With respect to journalism, in short, I would like to clarify that whilst the backbone of her analysis of all the five communities can be read as a semiotic relativist constructivism, the latter is most nuanced and questioned in the analytic thread of rethinking climate change media coverage and actors throughout the book. For the other discursive communities and their constituencies, Callison's methodological choice generates relevant and interesting accounts of how these communities imagine affecting and influencing their constituencies' meaning-making by translating climate change facts into language that is compatible with the constituencies (as understood by the respective community). Her accounts of those communities that I were not familiar with were of general interest to me; effectively, these accounts introduced me to the discursive play which these communities invest in. The book's wider contribution is thus to set out the imaginaries of its five communities.

However, *How Climate Change Comes to Matter's* introductions to the discourses within which a community performs itself (i.e. the patterns of how they talk and write about how they care and instill care about climate change in their constituencies), are not sufficient to engaging with the troubles of how the practices (of care) imagined in these discourses actually and materially work.ⁱⁱⁱ Other than exclusively valuing the specific analyses of these communities and their discourses, readers might ask which insights the comparison generates. In that respect, a book section that scrutinises how some of these discourses meet, how they constrain or enable each other, and how their comparison helps to nuance relativist analytics, seems to be missing.

Versions of mattering matter in analysing environments

Reading these two books alongside each other foregrounds the difference between concepts of matter. *Refining Expertise* presents an analysis that I read in terms of matter (even though Ottinger is not emphasising that concept); and the analysis points to both the material and the semiotic struggles over environments. In contrast, *How Climate Change Comes to Matter* uses the notion of matter to frame an analysis exclusively of semiotic meaning-making without systematically

scrutinising the material frictions in the dynamics of discourse. Reading these two monographs as part of STS, then, underlines that STS does not operate with a unified concept of matter.

As I am framing this review in terms of “how do environments come to matter?”, I need to acknowledge my intuitive take on the concept. My reading is shaped by a concept of matter-ing that is generative of analyses of both meaning-making as well as the material processes involved in the socio-technical shaping of non-antecedent realities. With John Law (2004) I am sensitised to consider the move in STS from analytics of “matters of fact” to “matters of concern” (Latour 2004b); from the stability of isolated things to things in dynamic relations, as “ongoing open process[es] of mattering” (Barad 2003, 817); from the ontology of things as a question of armchair definitions to their enactment, “ontological politics” (Mol 2002). I cannot ignore that my investment in such a sensibility for studying environmental matters (e.g. Lippert 2015) shapes my reading of Ottinger’s and Callison’s work.

Interestingly, Ottinger does not centrally refer to this kind of literature for her approach. Central seems to be an inspiration by Brian Wynne’s work on Cumbrian Sheep farmers and soil (see below). Still, she also draws on Bruno Latour (Latour 1987; Latour and Woolgar 1986) and Lucy Suchman (2000). Her central attention to the buckets seems to be shaped by her fieldwork vantage point, working as an environmental monitoring practitioner on monitoring techniques and “developing tools for interpreting bucket results” (191:n34).

Quite differently, Callison references some of the analytics in the close context I just framed as matter-ing as core to her approach: She relates to Latour’s (1987; 2004a; 2004b; Latour and Woolgar 1986) and Haraway’s work (1989; 1991; 2006). However, I cannot recognise how her approach is compatible with the attention to matter-ing and material semiotics that characterises Latour’s and Haraway’s analyses. Despite the references into the conversations associated with matter-ing, Callison’s concept of matter resonates more with a version of social constructivist analytics associated with Berger and Luckman, i.e. the social construction of the social (1966). This discussion provokes a gentle warning: “matter” may be a buzzword by now, but it is not always clear how that concept is used.

PUS: problematised, understood, stabilised?

Having argued for the existence of quite different analytical approaches of attending to matter, I wonder how these two books’ alternative analytics engage a shared central issue, which both authors explicitly foreground: the critique of the discourse of public understanding of science (PUS). Both books approach their problematisation of PUS by drawing on the body of work authored by, or associated with, Alan Irwin and Brian Wynne (1996). Callison and Ottinger use this work to trouble the very emphasis of the PUS formulation that suggests that publics matter to

science merely as receivers of knowledge that the public needs to “understand”. Instead, both books continue a line of STS investigations that analyse how science does not necessarily offer a homogenous and neutral body of facts ready for public understanding. Callison and Ottinger take Irwin and Wynne’s *Misunderstanding Science?* into different directions however.

Callison emphasises that science is embedded in society, incorporating a range of commitments and assumptions, leading to quite different understandings of climate change in different scientific fields. It follows that the five communities, which Callison studied, offer simply cases of yet further different understandings of the natural world, shaped by the specific commitments and assumptions of their specific discourses and human constituencies. Ottinger, in contrast, highlights that citizens are involved in the production of scientific knowledge, questioning the ascription of authority to scientists and calling for the democratisation of science. Accordingly, Ottinger’s study analyses how various actors around the two petrochemical sites have been included and excluded in shaping what counted as knowledge of pollution and health. This indicates how Callison’s and Ottinger’s analytical paths diverge.

Ottinger foreshadows her story by reading Wynne’s study of sheep and nuclear contamination (1996). In this reading, the material difference between soil types matters for what (more or less contaminated) substances are left on the ground, available for sheep to graze. Ottinger’s analysis of buckets follows this trajectory of engaging how materiality is involved in knowledge-making. Actors equipped with buckets produce a different knowledge than actors without buckets. The buckets and their samples are potent “objects that must be accounted for”, interfering in industry science stories (14).

She tells a story of how a fenceline community inhabitant presents an industry speaker in a public discussion with a bucket sample of air pollution to which the speaker reacts by asking “Can I breath it?” (13), forcing the industry actor to recognise the concern over pollution and health outside of industry science registers. The community activist made environments come to matter, then, through a material con-figuration of knowledge-making. This conceptual version of matter, thus, allows to develop a critique of PUS that foregrounds citizens as not only intellectually involved, but as also materially interfering in and contributing to scientific contestation and knowledge-making.

On the other hand, Callison’s book is significantly shaped by her reading of Jasanoff’s concept of civic epistemology as presented in *Designs on Nature* (2005). Key here is Jasanoff’s analysis of the different engagements with biotechnology in the United Kingdom, the United States and Germany. Callison uses this to suggest that scientific evidence is differently weighted in different cultural contexts. This allows her to recognise PUS’s imaginary of a correct understanding of science, followed by investigating how different discourse communities account differently for scientific facts. She finds that her five groups entertain different imaginaries of

climate change and how climate change matters. For example, she analyses a climate scientist's take on how reporters should approach climate change; this involves that the reporters "do their homework", requiring the reporter to engage with, *inter alia*, "scientific methods, processes, and conclusions", as much as with climate politics (83).

Yet, Callison does not trouble any of these, effectively reproducing PUS's imaginary of climate change facts. In contrast, she axiomatically troubles the assumption that climate change facts need to challenge these constituencies' moral and ethical orders by positing that it is central to "linking [climate change] to what people already care about" (20), rendering her analysis politically conservative in two ways: by, first, accepting the scientific account of factual reality and, second, accepting the five communities' moral and ethical orders.

Humans make environments matter, too

The two books centrally, but implicitly, also analyse the role of human agents in making environments matter. I read Callison's analysis as portraying discourse workers: the experts frame themselves as agents for environmental change, which they attempt to achieve by translating climate change into the discursive terrain of their constituencies. Success here depends on identifying the resources that the respective discourses provide and enrolling these strategically. Performing climate change as mattering, then, likens a play of words in which the guarantee to success is linking climate change to the respective constituencies' ontologies (imaginaries of what is), such as linking climate change to care for the creation of god, or to care for profit-making in the naturalised form of markets. Discourse workers are constrained only by semiotics. Performing greenness then seems like a discursive fad, reminding me of Fineman's (2001) analysis of corporate greening as fashion and mere management lingo.

In Ottinger's story, human agents take part in contesting natures (reminding me of Urry and Macnaghten's (1998) constructivist *Contested Natures*). By analysing the different discursive and material strategies of fenceline community activists and corporate environmental engineers, managers and scientists, her book foregrounds the friction between neoliberal discursive repertoire and discourses that crystallise between, e.g., health concerns, environmental justice and racism. As in Tsing's (2005) analysis, friction is not merely semantic but also material and historical. Both, working for and against neoliberalising society-nature relationships appears as troubled labour (although the activists are not necessarily paid for their work).^{iv} Whilst Ottinger offers us some of the life stories, and even multigenerational histories, of fenceline community inhabitants, the corporate adversaries as human actors are less historically and sociologically fleshed out. This gap might be partially filled by reading Ottinger's book together with Jamison's recent take on the making of green engineers (2013; and see note 3 for further relevant literature).

What does matter?

Where Ottinger helps us understand the conflictual characteristics of making environments matter and the confrontation with the dynamics of neoliberal environmentalism—ecological modernist discourse, Callison shows that ecological modernisation is not translated to all discourse constituencies and that a range of discursively successful environmentalisms exists. I am excited about these additions to environmental STS, helping to problematise analytically naive understandings of ecological modernisation as self-evident. Yet, where Callison leaves untouched the ontologies of what climate change is and how these climate changes are response-able (Haraway 1988; 2016) to scientific understandings, let alone to Gaia or terra, Ottinger's conclusion brings me back to Stengers' barbarism: the oil industry thrives, health and lives are at stake. Whilst engaging with a third nature, that which lives despite capitalism (Tsing 2015), may lead us into beautiful multispecies matterings and becomings, even kin-making (Haraway 2016), Ottinger's and Callison's work highlights the empirical field of attempts to manage Gaia.

STS analyses of practices in this field need to go beyond tracing the play of signifiers in environmental meaning-making. I suggest we could read Ottinger's book as a relevant generative gesture towards studying the material and semiotic troubles of neoliberal environmentalism but approach Callison's book as a troubling reminder: merely studying yet other semantic innovations about how a community should care about the environment is inadequate to understand environmental matters. We need explorations of how environmental matters are reconfigured in the material and semiotic practices of eco-modernist techno-fixes, managerial and policy technologies. How are different matters implicated and transformed in making environments matter?

Biographical note

Ingmar Lippert's research focuses on the borderlands between STS, human geography, organisation studies and environmental sociology. He has co-edited a collection of articles on the "situated practices of environmental management" (*Geoforum*) and currently edits a special issue on numbering, numbers and calculative practices (with Helen Verran) for *Science & Technology Studies*. His current work on environmental data practices is shaped by his work as an assistant professor with a focus on digital (un)accountabilities in the Technologies in Practice Research Group (TiP) at IT University of Copenhagen and in his collaboration with Tahani Nadim's 'Bureau for Troubles: Post-natural Histories and Futures' at the Museum für Naturkunde, Berlin (Leibniz Institute for Evolution and Biodiversity Science).

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i'Gaia' references the hypothesis of the self-regulating and interrelating living and dying organisms as shaping the environment on a planetary scale, sustaining the possibility of life on a precarious planet earth (see Lovelock and Margulis 1974), in which humans cannot be expected to master these planetary processes, but are merely one amongst many organisms shaping their environments. The decline and extinction of species is part of sustaining the life of others; and human populations are well at risk of the collapse of their ecological niches.

iiHere probably referring to the US-American, rather than the British, NGO Corporate Watch.

iiiIn my case, I am most familiar with the discourse of corporate social responsibility (CSR) engagement with climate change. With respect to this discourse's imaginary of sustainability accounting and the Global Reporting Initiative (GRI), readers who seek to go beyond comprehending the internal logic of this hegemonic discourse might want to engage with critical and/or empirical studies of the constraints in this field (e.g. Moneva, Archel, and Correa 2006; Levy, Brown, and De Jong 2010) or of how such carbon accounting, reporting and management—supposedly informed by these reports—works in situated and material practice (e.g. Vesty, Telgenkamp, and Rosce 2015; Lippert 2015).

ivAlthough Ottinger does not mention it, her analysis of neoliberalism and the environment may take part in the critical engagement with ecological modernisation. With respect to agents of ecological modernisation (as corporate environmental agents may well be analysed), I read her work as going well beyond the critical semantic analyses by Fineman and as linking to recent conversations about environmental management as situated practice (Lippert et al 2015) and the agents involved in contesting, configuring and maintaining environmental infrastructures (Blok et al 2016).