

The Anthropocene Event in Social Theory: On Catching Up with Non-Humans

Abstract

Signaling that ‘humanity’ has radically changed the Earth’s environmental parameters, the notion of the Anthropocene currently generates debate across the socio-cultural sciences. Noticeably, neo-Marxist and new materialist approaches stand out for the argument that the Anthropocene obliges social theory to catch up with new material realities. While sharing the conviction that the Anthropocene might institute a genuine ‘event’ for social theory and practice, however, we show in this paper that the analytical pathways cleared so far largely move us backwards to problems of scientism and economism. In search of a more viable path, we turn to science and technology studies (STS) and actor-network theory (ANT), whose long-standing focus on nonhuman agency is prolonged by Isabelle Stengers’ forceful argument that we must “accept the reality of Gaia”. Stengers’ challenge, we suggest, allows for a radically experimental social theory capable of dealing with nonhuman agencies in ways adequate to the Anthropocene event.

Keywords: Anthropocene; event; Gaia; Isabelle Stengers; new materialism; neo-Marxism; science and technology studies (STS)

This is exactly what I fear with the Anthropocene thesis; it proposes a ‘future perfect continuous’ tense, which puts theorists into a very agreeable position. The mess can now be forgotten, swallowed in a continuity that can be theorized in a single shot. Abysmal aporia will flourish, happily confronted by theoreticians hunting down shades of anthropocentrism in other theoreticians’ writings (Isabelle Stengers, in conversation with Davis and Turpin, 2013: 178).

In recent years, the Anthropocene has become something of a clarion call across the natural and social sciences, and extending well into the humanities. The concept places upon ‘humanity’ the burden of having radically changed the Earth’s environmental parameters, to the point where several ‘tipping points’ may soon be breached with incalculable but likely catastrophic consequences for the future of the planet. Little wonder that this unprecedented situation has generated anxiety, inside and outside academia, along with calls for analysis and action (Castree 2014).

In social theory, the Anthropocene has given rise to widely divergent interpretations.¹ As Isabelle Stengers notes in our opening quote, the Anthropocene appears indeed to put theorists in a “very agreeable position”, since almost everybody seems to be able to find in it a vindication of their own conceptual preferences. Thus, while scholars inspired by Marxism can criticize the term for failing to address colonial and capitalist histories (Malm and Hornborg 2014, Skillington 2015), others insist that the term raises the central question of how

¹ We assume in this paper a cursory knowledge of the *natural-scientific* literature on the Anthropocene (e.g. Crutzen 2002, Rockström et al. 2009). For a pertinent summary for social scientists, see Castree (2014).

to deal with the forces of the earth now shaping social and political agency, a task for which new forms of 'geopoetics' (Last 2017), 'geo-spirituality' (Szerszynski 2017) or 'geosocial futures' (Clarke and Yusoff 2017: 1) may be needed. Aligning with the latter set of suggestions, a range of broadly 'new materialist' scholarship furthermore argues that the Anthropocene obliges social scientists to catch up with a radically material and more-than-human, or 'inhuman', world (e.g. Clark 2011, Morton 2013, Wark 2015, Yusoff 2015). The shared thrust of this scholarship is that the present moment demands the incorporation of the non-human into social theory in new and more fundamental ways.

Given the significance of anthropogenic climate change, among other ecological disruptions, we find it difficult to disagree with the general orientation of this argument. Indeed, we also think that the Anthropocene holds the potential to institute a genuine 'event', in that it may well come to mark a decisive difference between a 'before' and an 'after' (Stengers 2000) for both the socio-cultural and the natural sciences. Precisely due to its importance, however, it is also relevant to carefully and critically examine positions that advocate for the more or less *wholesale* reinvention of social theory. In the following, we focus particularly on new materialism and neo- or eco-Marxism, since authors affiliated with these strands have put forward versions of this idea most forcefully. Upon close scrutiny, we do not find these arguments convincing. While new materialist approaches struggle with legacies of scientism, recent eco-Marxist formulations exhibit difficulties in shedding earlier forms of economism. Rather than offering any real transformation of social theory in the Anthropocene, both approaches ultimately return us to more of the same well-known problems.

Despite the fact that Bruno Latour and many others have pursued the study of nonhuman agency for several decades under the banners of actor-network theory (ANT) and, more broadly, science and technology studies (STS), neither new materialists nor eco-Marxists show barely any interest in these fields of inquiry. This omission is both symptomatic and troublesome, we suggest, because much STS has carefully avoided the problems of scientism and economism that still haunt these approaches.

Taking the intellectual history of STS into account thus effects something like a *reversal* of the interpretation of the relation between the Anthropocene and social theory put forth by new materialists and eco-Marxists. Rather than social science finally ‘catching up’ with the natural sciences by learning to take nonhumans and materialities seriously, it is more accurate to say that it is the natural sciences (and also, belatedly, theoretical formations within social science, including the ones just mentioned) that are at long last beginning to catch up with the STS insight that societies and cultures are fundamentally shaped by nonhuman agency.²

Highlighting and reinstating the STS legacy is not only a matter of bestowing recognition where it is due (though this is not trivial). Crucially for the present discussion, this field has also influenced the philosopher of science Isabelle Stengers (2015a, 2015b, 2017) who, in recent years, has developed the concept of Gaia as a figure of intrusion as a response, or alternative, to the Anthropocene (see also Clarke 2017). As we discuss, Gaia offers an alternative ‘cosmo-political’ scenography for the present situation, which has the benefit of opening up a

² See Latour (2000) for a related argument. Before his untimely death, Ulrich Beck similarly argued that the natural sciences were finally catching up with the social sciences via the Anthropocene event. We dedicate the point to him.

more experimental and situated pathway for the reinvention of social theory in the Anthropocene. In the course of this paper, we thus trace first the trajectory towards the Anthropocene recently followed by new materialists and eco-Marxists, before turning to examine Stengers' alternative.

Pathways to matter: The new materialisms

In the following sections, we critically discuss the influential new materialist and neo-Marxist responses to the Anthropocene outlined, respectively, by Nigel Clark (2011, 2014, 2017) and Jason Moore (2015). To situate both of these approaches, however, we begin by examining some premises of the new materialism in general. This is relevant because these and closely related ideas have helped to shape the intellectual space within which social-theoretical discussions about the Anthropocene currently unfold.

In their introduction to the edited volume *New Materialisms*, Diana Coole and Samantha Frost argue that current social "thinking about matter" entails a "reprisal of materialism" that must be "truly radical" (2010: 3). The "contemporary context", including the fact of climate change, they argue, "demands a theoretical rapprochement with material realism" (6) since novel natural science developments have made it incumbent to examine "the most fundamental questions about the nature of matter and the place of embodied humans within a natural world" (6).

The authors observe that previous materialist philosophers, including Marx, Nietzsche and Freud, were in fact also influenced by natural science (5). Yet, scientific understandings have changed dramatically over the last century. Thus, the classical Newtonian physics that inspired 'older' materialisms is insuf-

ficient in the 21st century. What is now urgently needed is a new materialism: “resonant with, and to some extent informed by, developments in natural science” (6-7). For Coole and Frost, post-classical physics holds special promise, since it shows matter to have become “more elusive.” Specifically, recent physics developments suggest that materiality cannot be reduced to physicochemical processes, but rather involves something ‘more’: “an excess, force, vitality, relationality, or difference, that renders matter active, self-creative, productive, unpredictable” (9).³

Making the qualification, conventional within these writings, as we shall see, that “scientific theories cannot simply be imported into philosophy” (13), Coole and Frost state that the new materialism does not entail any uncritical acceptance of scientific theories or findings on behalf of social theory. More circumspectly, they argue instead that: “the tropes and rhythms they [scientific theories] suggest can transform theoretical discourses” (13). However, as they descend into the realm of sub-atomic particles and dark matter, the difference between improper theoretical import and inventive tropic-rhythmic transformation itself darkens. Since Coole and Frost insist that the vocabularies of Marx and Nietzsche must be rethought since they got their physics wrong, it certainly *appears* as if they are being judged by the standards of contemporary science.

In turn, this raises the issue of what conceptual benefits are obtained by drawing on new scientific insights. As noted, Coole and Frost argue that the gain is an improved understanding of matter in terms of excess, relationality and dif-

³ Different views of ‘materialism’ aside, there is a noticeable similarity between this emphasis on elusiveness and excess and Graham Harman’s (2002) insistence that objects always exceed their relational deployment. Several of these ideas also resonate with Timothy Morton’s (2013) notion of the ‘hyper-object’. Exploring these connections is, however, beyond the scope of our paper.

ference, the realization that it is active, self-creative and unpredictable (9). Now, at first glance this list looks appealing, if also rather vague. Upon closer inspection, however, it is evident that each of these supposedly novel terms is closely related to concepts with long histories in socio-cultural theory. Thus, excess is usually affiliated with George Bataille, difference with Jacques Derrida and Gilles Deleuze, creativity with Henri Bergson, and relationality and unpredictability with pretty much all social thought over the last forty years. Despite the advertised novelty, it is thus far from clear how the new materialism “radically changes” the field.

Coole and Frost also make some more substantive methodological suggestions. Referring to climate change, they note that it requires a “new emphasis on the material dimensions of social existence” (16), a chord also struck by authors including Kathryn Yusoff (2015; 2017) and Nigel Clark (2011; 2017) whose work we discuss shortly.⁴ For Coole and Frost, to address global environmental devastation requires sensitivity to the “resilience of matter”, to the “importance of bodily experience” and, simultaneously, to the “myriad interrelated material systems needed to sustain citizens” (29). Accordingly, they advocate a “multimodal methodology... congruent with multitiered ontologies” that “run between different levels of the social system and especially between the microlevel or everyday, and the macro-level or structural” (29).

Methodologies that move between bodily experience and structural determinations have, however, been proposed by critical social theory for a long time, with or without materialist intent. Moreover, such approaches have been

⁴ Yusoff and Clark are central reference points here, among other things, due to their recent co-edited special issue of this journal on ‘geosocial formations’ (2017).

specifically challenged by the very same STS traditions, especially ANT, that are also famous for their studies of nonhuman agency (e.g. Author 2007). Among other things, these studies have identified problems with the idea of a given 'macro-structure', replacing it with empirical inquiries into the way scales are constructed through socio-technical processes of ordering (Callon and Latour 1981, cf. Author 2007). Of course, none of this prohibits Coole and Frost from traveling down the well-trodden micro-macro path. It is far from clear, however, how new materialism can resolve the hurdles that lie in waiting.

In short, then, there are several general problems with the new materialist premises: a veiled scientism, vague and unspecific claims to novelty, and the reinvention of existing methods together with *their* attendant problems. Nor is it insignificant that these arguments were developed with almost complete disregard for STS and ANT, which has discussed nonhuman agency and practical ontologies for decades (e.g. Author 2015). Indeed, this neglect appears particularly symptomatic since STS has dealt with these issues through detailed sociological, historical, and ethnographic studies *of science*, rather than by developing philosophical discourse about matter *based on science*.

An inhuman nature for social theory?

We now turn to a detailed examination of Nigel Clark's (2011) *Inhuman Nature*. Clark's work is especially relevant because he has since become a vocal spokesperson for geologic agency in the Anthropocene (Clark 2014, 2017). Here, however, we concentrate on *Inhuman Nature* since it presents his most detailed argument for a radically expanded role of the nonhuman in social theory.

This argument is constructed out of a range of elements, drawn somewhat eclectically from new materialism and object-oriented ontology. As regards the former, Clark refers to a series of thinkers, including Elizabeth Grosz, Vicki Kirby and Myra Hird, all of whom make clear that the biological and “inorganic systems that sustain life” also enable and provoke human culture (2011: 44, citing Grosz 2005: 43). Thus, Grosz refers to nature as ‘the ground’ out of which life emerges (see also Yusoff 2017: 5), Hird emphasizes the importance of microbes for maintaining and transforming the earth’s atmosphere, and Kirby aims to “reclaim nature as ground from those who.... would reduce nature or the ground to some kind of cultural-linguistic effect” (44). Clark combines these ideas with the speculative philosopher Quentin Meilassoux’s (2008) critique of ‘correlationism’, a term used to designate any post-Kantian philosophy skeptical of the possibility of reaching ‘things in themselves’.

Like Coole and Frost, Clark also reassures readers who might worry about his seemingly uncritical absorption of scientific claims:

It is, of course, crucial for social scientists to maintain a critical attitude towards the premises, practices and products of the physical sciences. We know this well enough by now that it need not be rehearsed at every meeting or reading (xviii)

Even so, a few paragraphs later, Clark makes explicit that his own

argument depends utterly on the ‘substantive’ findings of the earth scienc-

es and on the recent philosophical re-activation of the question of ‘things-in-themselves’ (xiv)

It is rather difficult to imagine how this ‘utter dependence’ can be squared with a critical attitude—let alone a sustained interrogation—of the “premises, practices and products of the physical sciences.” And, in fact, any trace of skepticism quickly vanishes. Shortly after, Clark approvingly cites the philosopher Ray Brassier’s claim that “fully mind-independent realities are found across multitudes of times, spaces, scales or fields of existence” (48). And thus,

plate tectonics, thermonuclear fusion, and galactic expansion (not to mention undiscovered oil reserves or unknown insect species) are as much autonomous, human-independent realities as the accretion of the earth. (Brassier, 2007: 59–60, cited in Clark 2011: 48).

From an STS perspective, we might wonder from whence comes the certainty of these ‘fully mind-independent’ facts. The answer is not long in waiting, and, unsurprisingly, they come with the unquestioned cognitive authority of scientists. Since the *genesis of scientific facts* (Fleck 1979 [1935]) is not subject to Brassier’s or Clark’s intellectual curiosity, their approaches slide dangerously towards scientism.

One finds in the work of Deleuze and Guattari—a source of inspiration for actor-network theory (ANT) (Schmidgen 2015: 6ff) as well as strands of new materialism (e.g. Coole and Frost 2010: 9) and Clark’s (2017) recent work on the Anthropocene – an almost opposite approach to scientific concepts. Rather than

mining the sciences in search of an ultimate ground, Felix Guattari wrote that “there is an urgent need for us to free ourselves of scientific references and metaphors: to forge new paradigms which are instead ethicoaesthetic in inspiration” (Evans and Reid 2014: 140, citing Guattari 1989: 131). The point is not, obviously, that either science or matter *does not matter*. Instead, it is that the creative evolution of different fields and disciplines has to be open to divergence. Given that they are dealing with qualitatively different problems, the social sciences and humanities become *neither more nor less materialist* by invoking particular object lessons of science. To become adequate to the Anthropocene, instead, each needs to invent their own mode of attention to nonhumans.

From inhuman nature and (back) to entangled worlds

Presenting himself as a sympathetic detractor, Clark (2011) agrees with Bruno Latour’s long-standing effort to grant nonhumans a role in social analysis. Akin to Coole and Frost’s demand for a ‘truly radical’ reappraisal of materialism, however, he is critical of what he perceives as ANT’s insufficient radicalness.

Constitutively hybrid, actor-networks are composed of a mixture of human and nonhuman entities. If one is in search of nature as an ultimate ground this becomes a problem, since one can find in Latour only “the most flickering hints of networks devoid of human involvement” (Harman 2009: 124, cited by Clark 2011: 37). Moreover, since ANT insists that to speak of or for others implies translation, “it is hard to imagine how a domain fully independent of the human can legitimately receive attention as anything more than an abstract possibility” (37). This objection comes as no surprise, since Clark follows Graham Harman and Ray Brassier in waging war on ‘correlations’. Because actor-

networks fail to follow through on the “beautiful and profound idea of nonhumans composing fully autonomous worlds of their own”, Clark finds them prosaic and “strangely conventional” (213).

Curiously, given their close intellectual companionship and mutual admiration, on this point Clark distinguishes sharply between Bruno Latour and Isabelle Stengers. While Latour is described as unable to ‘concede’ the potency of things, and thus ends up a closet correlationist, Clark sees Stengers as attentive to the inhuman, recognizing that even “[w]ithout our species, the earth would still pulse with life and the sun would pump out light and heat, heedless and unperturbed”, “indifferent to us” (49). Contrary to “many of her fellow science studies scholars”⁵, he writes (38), “who emphasize the human–nonhuman co-construction of climate”, Stengers:

drives home the point that issues of global ecological transformation... encourages us to conceive of the planet not just in terms of our own interchanges with it, *but in and for itself*: “Of the Earth, the present subject of our scenarios, we can presuppose a single thing: it doesn’t care about the questions we ask about it” (Stengers: 2000: 145; cited by Clark 2011: 38).

In fact, however, it is unlikely that most STS scholars would disagree. This includes Latour, who began his *Irreductions* (1988: 193) with the following comments:

⁵ Clark does not identify any of these ‘many’ scholars. Stengers is neither typically seen as, nor sees herself, as a science studies scholar.

Things-in-themselves? But they are fine, thank you very much. And how are you?... The tree shows what it can do, and as it does so, it discovers what all the other forces it welcomed can do. You laugh because I attribute too much cunning to it? Because you can fell it in five minutes with a chain saw? But don't laugh too soon... Soon you may have no more fuel for your saw. Then the tree with its carboniferous allies may be able to sap *your* strength. So far it has neither lost nor won, for each defines the game and time span in which its gain or loss is to be measured.

As this quote suggests, the difference between ANT and Clark's new materialism is hardly found in the latter's more profound appreciation that things enjoy their own recalcitrant modes of existence. Aside from this rather thin critique, however, there are real differences at the level of conceptual and analytical effects. These can be clearly brought out by tracing Clark's (2011: 38) interpretation of Stengers' (2000: 128) observation that "[e]verything changes when one leaves the laboratory" as support for his notion of an inhuman nature.

To be sure, as Clark would have it, Stengers emphasizes that outside the circumscribed space of the laboratory, nonhuman forces cannot easily be controlled. On the outside, she writes, "one finds friction, wind, the irregularity of soil, and the density of milieus" (2000: 128). Upon closer inspection, however, this has little to do with an interest on her part in 'fully mind-independent' things. Rather, Stengers is addressing the impossibility of maintaining a strict separation between scientific facts and fictions outside the space of the laboratory. As vividly exemplified by climate and ecological controversies, on the outside it does indeed become very difficult for scientists to control the situation by re-

ferring to objective facts. It becomes correspondingly harder to identify any *pure and untainted* testimony to an inhuman nature.

It is thus significant that Clark neglects to follow Stengers' paragraph to the end. After having listed wind, friction, and the irregularity of soil, she continues:

And one also finds a world acted on by other actors, pursuing other projects, which also imply a differentiation between what must be taken into account and what it would be suitable to neglect. With regard to these actors, the scientist conscious of changing milieus could ask himself: "Why am I so interesting to them? Where are all the others, who are capable of taking into account everything that my laboratory must eliminate in order to authorize me to speak?" (2000: 128)

In the end, then, Stengers's concern has nothing to do with trying to access a world indifferent to the plight of humans. Instead, her problem, similarly to Latour's (e.g. 2004), is how to *extend the scientific event without obliterating* all the 'correlations' that make people everywhere think, feel, and act. Ironically, such 'correlations' nowadays include the ethics, politics, and activities of increasingly frustrated earth scientists and ecologists, who venture beyond their laboratories and into the agora in the hope of having their concerns heeded (see Stengers 2015a). Rather than vindicating the idea of a totally external nature – to be doubly ventriloquized, first by natural scientists and then by social theorists infatuated with things in themselves – objects are exhibited as gaining or losing existence through processes of relation-making that stretch into varied ecologies of practice far beyond science (Stengers 2005).

This is why the Anthropocene event, which Stengers (2015b) calls the intrusion of Gaia, is indeterminate—like all events—except by its effects and “the problem posed in the future it creates” (Stengers 2000: 66):

Its [the event’s] measure is the object of multiple interpretations, but it can also be measured by the very multiplicity of these interpretations: all those who, in one way or another, refer to it or invent a way of using it to construct their own position, become part of the event's effects. In other words, every reading - even a reading that denounces the event and calls it a fake - still situates the one who proposes the reading as an heir, as belonging to the future whose creation the event contributed to... Only indifference “proves” the limits of the scope of the event.

Far from ‘conceding’ the potency of the inhuman, Stengers (here, as elsewhere, in close conversation with Latour) elucidates the varied *entanglements* of people and diverse earthly powers. Once one leaves the scientific laboratory, she obliges us to ask: where are *all the others*, capable of taking into account what the laboratory itself could not? Today, climate and earth scientists are posing such questions – both to social scientists and to wider publics.⁶ In recent work Nigel Clark (2017) has indeed also begun to ask such questions with reference to earth systems governance. This has not, however, led him to reappraise his strident arguments on behalf of geology and geological forces ‘in themselves’.

Considering the rhetorical energy spent on differentiating his inhuman

⁶ This includes scientists like James Hansen, Brad Werner and Hans Joachim Schellnhuber. See Author (2014) for a discussion of the potentially radical politics at work in their practices of extra-scientific alarmism.

approach from Latour's 'strangely conventional' analyses, we might expect Clark's own analyses to look altogether different. In reality, however, it appears to be difficult for Clark (2011) to spell out just how, why, and to whom the attention to radically inhuman matters should matter.

The problem is that, as a social scientist, Clark is still obliged to deal with people and their situations. Thus, after spending many pages demolishing Latour's residual anthropocentrism (along the lines outlined by Stengers in our opening quote), Clark eventually turns to Emmanuel Levinas to develop an analysis of sociality and hospitality in the wake of environmental catastrophe (193ff). Rather than entering the 'beautiful and profound' realm of fully autonomous non-human worlds, we find ourselves amidst many social relations, organizations, politicians, scientists and other people who make sense of disaster and respond to it.

In the end, inhuman nature thus appears to function mainly as a persistent reminder that floods, fires, and storms do indeed occur and that they do affect people in multiple ways. The insight is important and very difficult to disagree with. It is difficult, however, to see as either particularly radical or new.

Updating Marx for the Anthropocene

If forms of scientism operate within debates on the new materialism and (some versions of) object-oriented ontology, they also form a more than coincidental thread within another prominent set of social-theoretical responses to the Anthropocene: those of a renewed eco-Marxism.

Marx himself grew increasingly interested in natural science as he developed a theory of the 'metabolism' of Man and Nature and the (alienated) labor-

induced ‘metabolic rift’ of capitalist exploitation of natural resources (Wark 2015).⁷ Moreover, much of the Western Marxist canon is committed to the possibility of characterizing the ‘true’, ‘underlying’, ‘systemic’ or ‘total’ view of Social (or Socio-Natural) Reality, capital R. In this sense, much Marxism assumes what Harman (2015) dubs a ‘truth politics’ that, to varying degrees, extends scientism from the natural and into the social sciences.⁸ There, it routinely, although not exclusively, takes the form of economism.

Here, we examine how this kind of approach works to transform the Anthropocene into the Capitalocene. By no means lacking in conceptual inventiveness, this labor of redefinition nevertheless raise a series of issues, several of which resemble those encountered in the case of new materialism.

The notion of the Capitalocene has been given a range of interpretations by quite a heterogeneous group of scholars. The political ecologists Andreas Malm and Alf Hornborg (2014; Malm 2015) deploy the term as part of a frontal critique of the ‘species concept’ of the Anthropocene. By locating agency at the level of the human species, they charge, Anthropocene scholarship fails to analyze the ‘vested interests’ of capitalism as the historical agent of inequality and exploitation all over the planet.⁹ Meanwhile, the feminist science studies scholar Donna Haraway (2016) uses the Capitalocene as a stepping-stone towards a de-

⁷ Yet, as Stengers (2017: 383) notes, Marx could not possibly have either foreseen the present climate menace to nature’s ‘universal metabolism’ or analyzed its consequences in advance.

⁸ Hence the pronounced interest many neo-Marxists take in critical realist philosophies of science, imagined as a bulwark against the (regularly caricatured) dangers of ‘post-modernism’, ‘relativism’ and ‘social constructivism’ of unorthodox thinkers such as Latour. See Foster and Clark (2016: 16n40) for an amusing example.

⁹ Importantly, part of this neo-Marxist critique (Malm and Hornborg 2014: 66) is directed at Dipesh Chakrabarty’s (2009) ‘four theses’ on climate change. Later we consider Chakrabarty’s recent counter-argument (2017).

centered call for attending to ‘kinships’ across human and non-human worlds.¹⁰ Mediating between these somewhat strange bedfellows is the sociologist Jason W. Moore’s work on *Capitalism in the Web of Life* (2015), cited with approval by Haraway (2016: 47ff) who also contributes to a recent volume, edited by Moore (2016), on the ecological crisis of capitalism.

In a way, *Capitalism in the Web of Life* (Moore 2015) occupies a position resembling that of Nigel Clark’s *Inhuman Nature*, except that its starting point is eco-Marxist rather than ‘new’ materialism. As we have seen, Clark’s mixture of new materialism and object-oriented ontology aims for a wholesale reworking of social theory via the notion of an inhuman nature. In contrast, Moore seeks a radical undoing of the Society-Nature dualism, which is depicted as preventing Marxism from reaching its full critical potential, especially in the present era of environmental crisis. Similar to Clark’s inhuman impasses, however, Moore’s revisionist project also leads (back) to some rather intractable problems.

In a nutshell, Moore develops an analysis of capitalism as working *in* and *through* nature, rather than being located on its ‘outside’. Conceived as a form of power-laden ‘environment-making’ (Moore 2015: 45ff), this world-ecological perspective on capitalism thus lets go of widespread tendencies, including amongst eco-Marxists, to maintain a nostalgic dualism of Society and Nature. Moore proposes instead to think capitalism through the notion of the *oikeios*, “the creative, historical, and dialectical relation between, and also always within, human and extra-human natures” (35ff). As a ‘multilayered dialectic’, the *oikeios* comprises flora and fauna, but also the planet’s manifold geological and bio-

¹⁰ It is a stepping-stone because Haraway develops yet another concept, ‘the Chthulucene’. We do not discuss this concept further here, but it bears family resemblance to Isabelle Stengers’ Gaia, which holds our attention below.

spheric processes, as these gets 'bundled' up with what is usually called 'social' organization. Moore thus sees historical agency as an emergent property of "configurations of human activity with the rest of life".

The question of alterity; or, how to undo economic totalization?

Reading *Capitalism in the Web of Life*, it is striking just how aligned Moore's project *could have been* with what he hastily dismisses as those 'cultural studies' that "highlight hybrids, assemblages, and networks" (assigned in a footnote to Bruno Latour) (33). However, while Moore (48) rhetorically asks whether "anyone today seriously doubt that diseases, or climates, or plants make history as much as any empire?", and even as he answers in a way strongly reminiscent of Latour, Haraway, Stengers or Anna Tsing (2015), his engagement with this body of literature barely extends beyond the footnote just mentioned.¹¹ Instead, the examination of these more-than-human connections proceeds via the Marxist canon. This unwillingness to loosen up Marxist orthodoxies ultimately becomes a stumbling block for Moore's inventive ambitions.¹²

Moore wants to rethink capital as a form of human-*and*-natural value, which has achieved global hegemony since the 16th century due to the accessibility of 'cheap nature.' Cheap nature: food, labor-power, energy, and raw materials for which capital always pays too little, "is the necessary condition for every great wave of accumulation" (119). Latter-day ecological crises, however, signal that capital is running out of cheap nature to extract. In the end, therefore, much

¹¹ One exception is Moore's (2015: 62) partial appropriation of Haraway's idea of the 'God-trick,' which he sees as an *inherent* feature of 'bourgeois knowledges' of nature and hence as complicit in capital's project. For a more nuanced treatment of Haraway's Marxist inheritance, see Wark (2015).

¹² Even so, we agree with McKenzie Wark (2015: 129) that Marxism must be seen "as a heterogeneous collection of rhetorics, theories, methods, results."

hinges on the conceptual boundary between capital and its 'outside', or alterity. But this is where things get tricky. As noted, Moore rejects the idea of a pre-capitalist, pristine, or unspoiled Nature, emphasizing instead historically and geographically specific projects of capitalization, wrought within shifting relations of power. In this analysis, cheap nature emerges as a dialectics of contingent-but-powerful capitalist strategies that run up against their own unforeseen consequences.

This strategy, however, raises difficulties in determining whether capitalism actually has *any* outside, or whether our current 'web of life' is fully encompassed by it. Indeed, by sticking so exclusively to the *oikeios* of capital, Moore's analysis ends up looking quite inadequate to the Anthropocene event. As Dipesh Chakrabarty (2017) has written in response to his neo-Marxist critics (Malm and Hornborg 2014), unequal global capitalism as such offers no *specific* conceptual handle on humanity's long-term ecological overshoot.

Contrary to Marxist objections, accepting the Anthropocene event is not a matter of replacing capitalism with species as a master concept. As Chakrabarty (2017) notes, it is instead about developing concepts and forms of analysis that make it possible to keep several empirical settings and levels of theoretical abstraction in simultaneous view, rather than stubbornly retaining 'capitalism' as *the* master-key for unlocking a presumed planetary totality.

The limitations of Moore's conceptual strategy are particularly vivid in his analysis of the resistance to the 'cheap nature' of genetically modified crops (GMOs) (205). This analysis neglects to take into account not only the importance of (supra-) nation-state projects and the varied interests and ideologies of the United States (US) and Europe (e.g. Stengers (2015b, 2017: 390), but also

ignores environmental movements in general based on the claim that they have achieved nothing but a shift of production costs from the global North to the South (Moore 2015: 228). On this flimsy basis, the fierce contestations over capitalist projects across the global South, from justice-oriented social reformers, environmental activists, indigenous groups and others (e.g. de la Cadena 2015) are discarded by Moore as irrelevant to the eco-Marxist project. As for nonhumans, they are assigned the limited role as ‘reserve energy’ for capital, thus disregarding their amply documented agency, unruliness and unpredictable political effects (e.g. Author 2015).

If the problem with Clark’s new materialism was that no matter how hard he tried to evacuate people from inhuman nature they kept slipping in, then the trouble with Moore’s neo-Marxism is that even as he tries to find ways of letting non-human, non-capitalist otherness into his analysis, his analytics keeps squeezing it out. It is hard to avoid the conclusion that *Capitalism in the Web of Life* fails to conceive any conceptual alternative to the unfettered movements of capital.

Even so, Moore’s depiction of capital as a patterned set of historical and power-inflected projects that de-valorizes nature and exceeds capitalist aims is interesting. These ideas resonate with a range of approaches developed in STS and its vicinity, including Michel Callon’s (1998) studies of calculation and value and Anna Tsing’s (2015, cf. Stengers 2017: 388) more-than-human ethnography of patchy capitalist frontiers and ruined landscapes – even though the latter pays much more careful attention to the unruliness of non-humans, like bacteria and fungi, which constantly trouble the strategies of plantation capitalism. Moore also shares critical intent if not conceptual orientation with Stengers’ cosmopo-

litical attempt to resist capitalism's eco-political irresponsibility in the face of Gaia's intrusion (Stengers 2015b; see also Clarke 2017: 6ff).

The import of these analyses, and the issues at stake, are captured by Haraway (2016: 48) who writes that to think the Anthropocene well

one must surely tell of the networks of sugar, precious metals, plantations, indigenous genocides, and slavery, with their labor innovations and relocations and recompositions of critters and things sweeping up both human and nonhuman workers of all kinds

The question, therefore, is how to recognize the brutal efficacy of capital while also noticing its many gaps and interstices, all the while *also* paying attention to the fragile articulation of global capitalism with all sorts of *other* political matters, including unruly nonhumans. How, we can ask with Philippe Pignarre and Isabelle Stengers (2011), is it possible to inherit Marx's *pragmatic* impulse of anti-capitalist struggle while eschewing *theoretical* tendencies towards totalization and economism?

Where Moore fails to convince us is indeed precisely in the argument that world-ecological Marxism offers a *general* program for rethinking social theory after the Anthropocene event. Among other things, the characteristically Marxian failure to accord much conceptual and practical significance to science, culture, or even politics is bizarre, not least in light of the assertion that 'cheap nature' may be coming to an end. If anything, discourses of the Anthropocene, akin to many discussions of environmental side-effects, disruptions and crises since the 1960s, have served to stake out *limits for* and *resistances to* the spread of capi-

tal's projects, through activist mobilizations, public critiques, and localized struggles (e.g. Beck 1992; Latour 2004; Author 2013; Author 2015).

In some ways innovative, Moore's neo-Marxist approach is thus ultimately unable to carry through the important task of thinking the limits and vulnerabilities of capital.¹³ When all is said and done, the notion of Capitalocene mainly signals that the true novelty of the Anthropocene has not yet registered in Marxian social theory. And, accordingly, we are encouraged to search for alternative theoretical pathways into the Anthropocene. In the following, we initiate such a search by following the trajectory of STS and ANT, which is currently being prolonged by Isabelle Stengers' (2015a) insistence that we "accept the reality of Gaia."

Alternative pathways: Reckoning with the realities of Gaia

Our examination of how new materialists and neo-Marxists conceive the implications of the Anthropocene for social theory has indicated that, advertisements of novelty notwithstanding, what is on offer is more adequately described as various *returns* (to forms of scientism and economism, respectively).¹⁴

Noticeably, STS studies are either ignored (Coole and Frost 2010; Moore 2015; also Clark 2017, Yusoff 2015) or caricatured and discarded (Clark 2011) in

¹³ Latour (2014) suggests that the famous quip by Frederick Jameson that "nowadays it seems easier to imagine the end of the world than to imagine the end of capitalism" speaks mostly to a sense of fatigue amongst neo-Marxists. For a study of how the affects and hopes of capitalists and anti-capitalists mirror each other, see also Miyazaki (2006).

¹⁴ Despite their problems, the programmatic clarity and conceptual focus of Clark and Moore's frameworks facilitates informed discussion about the shape of an adequate social theory for the Anthropocene. In our view, this can be contrasted with a welter of more eclectic and, quite often, simply incongruent statements also in circulation. Bonneuil and Fressoz (2016) is a good example of such a tendency.

these strands of work. This is so despite, or perhaps because, of the fact that STS has been at the forefront of conceptualizing nonhuman agency for several decades. Though such disregard obviously clears a space for claims to novel theorizations, the consequence, as we have seen, is akin to the reinvention of various wheels with long known manufacturing defects.

Importantly, one thus finds in both Clark's new materialism and Moore's eco-Marxism a serious *reduction* of the ontological and political capacities of nonhumans to exert themselves against the grain of dominant socio-technical framings. This is most obvious in Moore's (2015: 14f) application of the tropes of 'labor' and 'energy' to nonhuman forces such as rivers, plants and animals, which domesticates these forces by locating them as *already* inside the machineries of capital.¹⁵ In Clark (2011, 2017), the reduction works through the presupposition that nonhuman agency should be addressed 'on its own', that is, without regard for relations of nonhumans to people, including the scientists whose knowledge practices make it possible to speak on behalf of geologic formations in the first place. In different ways, both approaches diminish rather than enhance the ability of social theorists for dealing with the many human and nonhuman entanglements whose intensification is characteristic of the Anthropocene (Author 2013).

Moreover, there is here a shared problem pertaining to a lack of attention to the making of new Anthropocene *scales* of knowledge and practice, from the local to the planetary, as well as articulations across them (see e.g. Edwards 2010). As previously noted, ANT is noticeable in social theory in part for turning

¹⁵ On this point, Moore follows Richard White (1995) who depicts the water flows of the Columbia river in terms of geophysical energy conversion. For a discussion of the consequences of this analytical move, see Author (2015).

questions of scale, from ‘micro’ to ‘macro’, into practical socio-material achievements (scale-making) rather than treat them as ontologically fixed parameters of social life (Callon and Latour 1981). Neither Clark nor Moore, however, provides us with tools to analyze the Anthropocene as an emerging ‘planetary’ experience that must be continuously adapted, concretized (Simondon 1980: 48) and politically articulated with varied forms of knowledge.

By contrast, Latour’s work (2004) informs Chakrabarty’s (2009: 207) argument that the Anthropocene assists the undoing of the long-standing Western separation of nature (known by science) from culture (and politics). Extending this line of argument, Deborah Danowski and Eduardo Viveiros de Castro (2017) argues that whether and how the Anthropocene event is at all *registered* or made to *resonate* outside the confines of elite (Euro-American) science-policy networks, and if so on which ontological terms, must henceforth be seen as a central postcolonial question for social theory. This line of inquiry, we want to suggest, is further intensified through Isabelle Stengers’ explorations of Gaia.

Stengers’ Gaia, and the need to reconfigure social theory

In our view, the “intellectually serious extra-scientific figures of Gaia” (Clarke 2017: 2) forged in these years by Bruno Latour (2011), Isabelle Stengers (2015a, 2015b, 2017), Deborah Danowski and Eduardo Viveiros de Castro (2017) offer the most promising attempt to extend STS insights and make them adequate to the Anthropocene event.¹⁶ Among these, Stengers’ work stands out for the radi-

¹⁶ One important manifestation of this wider set of dialogues was the colloquium, organized in Rio de Janeiro in September 2014 by the philosopher Déborah Danowski and the anthropologist Eduardo Viveiros de Castro, on *The Thousand Names of Gaia*. Bruno Latour and Donna Haraway presented at the symposium, and Stengers’ contribution was central to the discussions. See Danowski and de Castro (2017).

cal challenge it poses to a social theory bent on fully addressing Gaia's new realities.¹⁷

The crux of Stengers' (2015a) cosmopolitical proposition for the Anthropocene era is that, in the face of multiple environmental crises, we must come to 'accept' the reality of Gaia in both intellectual and political terms. A term of multiple origins, Gaia was a primordial deity in Greek mythology long before it was adopted in the 1960s by the chemist James Lovelock and the microbiologist Lynn Margulis to name the hypothesis of Earth as a complex, self-regulating system (see Clarke 2017). As Stengers notes (2015a: 134), the term has since been multiply re-incarnated, including in New Age mysticism and non-mainstream climate change science, making it a "bastard child of climate sciences and ancient paganism". Rather than compromising, however, Stengers sees Gaia's constitutive hybridity and indeterminacy as generative of its conceptual potential.

Signifying neither the conventional figure of Nature or the Earth, for Stengers Gaia designates a new, ominous being with its own regime of activity and sensitivity. At once hyper-responsive to (some) human actions, and unpredictable in response, she refers to Gaia as 'ticklish' (Stengers 2015b: 47). Unfortunately, even as these 'ticklish' reactions may well prove deadly to humankind, Gaia is also 'indifferent' to our concerns. Contrary to theaters of political adjudication, where people have a chance to justify their actions or to seek mercy, accepting the reality of Gaia thus means accepting that we are now living in a realm of non-negotiable yet largely unknown or indeterminate demands, and that if we fail to respond adequately our cries will not be heard.

¹⁷ Space prevents us from exploring here the overlaps and differences between Stengers' and Latour's figures of Gaia. See Clarke (2017) for a useful discussion, which pursues a rather different intellectual agenda than ours.

This is why Stengers (2015b) defines Gaia as an ‘intrusion’ into collective historicity, to which everyone, social theorists included, will have to learn to respond. The response is figured as a cosmopolitical ‘slowing down’ (Stengers 2005) of reasoning that in our view has multiple implications for social theory.

Given Gaia’s indifference to human pleas, it is indeed possible to speak of an asymmetric relation to a new ‘ground’, of the kind that held Clark’s (2011, 2014) attention. For Stengers, however, Gaia does not designate a set of inhuman materials forming autonomous worlds. Quite differently, it operates as a speculative concept constructed to induce new appetites for thinking and acting in entangled worlds. Noticeably, therefore, Stengers’ key questions concern what accepting the reality of Gaia would mean *for* and demand *from us* (an us that, as noted, includes social theorists). At the same time, however, she insists that Gaia’s demands must now be assumed to be a permanent feature of the world. Humans, therefore, will be answerable to Gaia for good. Accordingly, Gaia names an unprecedented form of ‘mundane’ transcendence (Clarke 2017: 7), deprived of any guarantees. In this precise sense, Gaia’s intrusion into historicity marks an event; an irreversible difference between a ‘before’ and an ‘after’.

According to Stengers (2015b: 44ff), Gaia’s hybrid genealogy is particularly useful because it obliges social theorists to scrutinize practices and shifts inside and outside the natural sciences *with equal care*. What is thereby underscored is the importance of simultaneously analyzing the transformations Gaia undergoes in the hands of different scientific disciplines *and* in the broader ecology of cultural and political practices, across widely divergent settings. Making clear that there is no given hierarchy between scientific and other forms of knowledge, Stengers argues (ibid.) that Gaia offers a way of resisting “the temp-

tation of brutally opposing the sciences against the reputedly ‘nonscientific’ knowledges”. At issue, instead, is the “necessity of inventing” new ways of ‘coupling’ divergent forms of knowledge and practice.

Contrary to the remnant scientism of new materialism and the vestigial truth politics of neo-Marxism, Gaia’s intrusion thus signifies a situation of radically uncertain socio-natural practice and politics. Importantly, this is not the uncertainty beloved by climate skeptics, since Gaia in its present state was produced by climate change. Instead, it is an uncertainty that infiltrates science, politics, and civic action at the level of practice, as no one knows how to adequately respond. Since social scientists, no more than their natural science colleagues, can lay claim to an extant position from which to identify an Anthropocene totality, a social theory troubled by Gaia’s intrusion requires a far-reaching reconsideration of inherited concepts and modes of research.

By resituating ‘capitalist sorcery’ within a decidedly *non-Marxist* scenography of forgotten legacies, collective resistances, mutual learning processes and civic experiments in living differently, Philippe Pignarre and Isabelle Stengers (2011) have taken steps towards such a reconstruction. Similarly, Stengers (2015b) has re-described the European GMO resistance as a process that forged new alliances among concerned scientists, environmental activists and capable lay publics. These examples are indicative of the kinds of knowledge-making and civic-political learning processes now needed in response to the incapacities and cynicism of technocratic political elites.

In this novel situation, Stengers (2015b) thus insists on the importance of social theoretical experimentation, understood as an ongoing effort to learn from other interested and inventive actors how to collectively resist the probability of

a 'coming barbarism'. Thus, she calls for a situated and non-foundational practice of social science that would take into account, and be responsive to, a range of divergent but allied knowledges and practices: natural-scientific, activist-public and otherwise. To our minds, the aspiration to learn to become affected by the knowledges, feelings, and practices of all those others, human and nonhuman, who inhabit the fraught or ruined landscapes bequeathed to us by the 20th century, holds far more practical *and conceptual* promise than the development of ingenious defenses on behalf of 'matter itself', or offering yet another critique of capitalism.

Since the 1960s, environmental history, activism and politics across all continents have generated a wealth of practices, the conceptual importance and pragmatic efficacy of which is partly exhibited, yet far from exhausted, in social theory (see Author 2015). Should trees have legal standing? (Stone 1972). Might Earth-beings be ascribed constitutional rights? (de la Cadena 2015). Can Japanese Shinto practices re-enchant the capacities of nonhumans? (Author 2013). How to care for and live respectfully in a more-than-human world of charismatic animals (Author 2010), sprawling and travelling fungi (Tsing 2015) or alien oceans (Helmreich 2009)? Can Gaia help break the long legacy of Euro-centrism in social theory, making it sensitive to other histories? (Danowski and Viveiros de Castro 2017). Obviously, the questions raised are legion and no pre-formed answers are lying around; they are waiting to be invented.

Addressing such questions therefore depends on a genuine willingness to put inherited socio-theoretical certainties *at risk*. This entails a reconfiguration of social theory in the image of what Deleuze and Guattari (1987: 372f) called the 'following sciences', defined by a focus on empirical and conceptual variations

and singularities and by locating research in *the world*, and operating *alongside* a multiplicity of others (Author 2012, Savransky 2016). Were such a reconfiguration to succeed – unlikely as it seems – the Anthropocene might indeed be worth remembering as a generative event in social theory.

Conclusion: Experimenting with Matters

After the Anthropocene event, it seems clearer than ever that “theory is always a detour on the way to something more important” (Stuart Hall, quoted in Wark 2015: 7).¹⁸ Yet determining which kind of detour Anthropocene theory is going to be and where it is going to lead, depends on what one makes of theory and of its many entanglements. Hall’s statement must then be complemented with Donna Haraway’s (2011: 4) insistence that “[i]t matters what matters we use to think other matters with.”

As we have seen, the Anthropocene has generated calls for novel approaches to social theory and some claims to have already delivered on the demand. It is probably not coincidental that the gold rush to create *new* theory for the Anthropocene has led to the misrepresentation or erasure of existing approaches to the nonhuman, notably from STS. This is not to say that STS provides any off-the-shelf solution either. Its analyses of nonhuman agency does, however, open up some alternative pathways into the Anthropocene.

In our view, Stengers’ proposition to accept the reality of Gaia’s intrusion offers the most promising extension of this legacy. Taking this intrusion seriously in social theory requires the development of an art of immanent attention to

¹⁸ It is interesting to find a convergence in conceptual sensitivity towards ‘theory’ across our STS-informed position and the innovative branch of contemporary eco-Marxism developed by Mackenzie Wark.

the politics of varied matters as they unfolds across the whole ecology of practices. Well beyond the present preoccupations of Euro-American social theory, environmental history, activism and politics are all chockfull of sites of resistance and experimentation, the political efficacies and conceptual capacities of which are far from exhausted. Slowing down theory sufficiently to learn from these multiple sites must be the starting point for an approach adequate to the problems posed by the Anthropocene event, and an irritable, ticklish Gaia.

If one thing seems clear at this moment, it is that the pursuance of social theory must henceforth be carried out in a register that is fundamentally attentive to nonhumans: one way or another theory must become socio-material, rather than either 'social', 'political', 'economic', or 'scientific'. Accordingly, we can only develop adequate responses to Gaia's intrusion on the basis of a firm commitment to *following, learning to be affected by, and experimenting with* the many divergent knowledges and practices of natural science, environmental activism, and concerned publics currently emerging around the planet.

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