Thinking the New Earth: Cosmoecology and New Alliances in the Anthropocene[1]

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Abstract

The term "Anthropocene" was coined two decades ago to "emphasize the central role of mankind in geology and ecology." Since then, its meanings, assumptions, and consequences have been subject to continuous debate across academic disciplines and in popular culture.

For some the Anthropocene names a universal planetary condition, which others view as blind to the co-existence of incongruent ontologies and more-than-human worlds. Some argue that the Anthropocene papers over colonialism and the violence of capitalist extraction, while others think it intensifies politics by rendering it ontological. To some the term is testimony to human hubris and arrogance. Yet to others, it operates as a profoundly anti-anthropocentric concept, which depicts an unprecedented situation of human vulnerability and diminished agency. Finally, as noted above, some use it as a clarion call for a true integration of knowledges, while it speaks to others of the need for sophisticated conjunctions of knowledge across a heterogeneous ecology of practices.

In each case, my perspective aligns with the second alternative. I am convinced that most modern conventions and dualisms leave us helpless to address Anthropocene challenges. A profound transformation of our ecologies of knowledge and practice are required to nourish cosmo-ecological alliances capable of thinking the new earth. In light of the increasingly manifest inadequacy of existing theories, tools, methods, and concepts, collective speculation and experimentation *across significant difference*—from indigenous collectives to urban design, and geology to fiction—is urgently needed to stave off catastrophe and *do better* in the relatively near future.

Keywords: Anthropocene; cosmoecology; ecology of practices; sophisticated conjunctions; nature-culture

The atmospheric chemist Paul Crutzen and the ecologist Eugene Stoermer (2000, p. 17) coined the term "Anthropocene" two decades ago to "emphasize the central role of mankind in geology and ecology." Since then, its meanings, assumptions, and consequences have been subject to continuous debate across academic disciplines and in popular culture.

Despite these controversies and uncertain implications, many of the processes and events to which the Anthropocene brought attention are by now well-known and accepted. Consider, as a sample: global warming due to rising CO2 levels is drastically transforming ecologies across the earth. Several planetary boundaries that ensure planetary livability for

[1] This text originated as a lecture given at Osaka University in 2016. An abridged version was published in 2017 in 現代思想 (Gendaishisou [Contemporary Thought]) as「地球を考える−−「人新世」に置ける新しい分野の連携に向けて. In light of many later events and a different context of publication, the present version has been thoroughly revised and overhauled.

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humans and many other species have been crossed. Biodiversity is plummeting as we accelerate into the sixth mass extinction event. Hardly a day goes by without news about droughts, melts, storms, floods, and fires from all corners of the planet. Asian megacities are especially climate vulnerable. Air and water pollution have gone through the roof in many places—including Bangkok—while water tables drop and canals, rivers, and oceans choke in plastics. While the kinds of devastation are many, varied, and unevenly distributed, global change will affect everybody (see Jobin, Ho, & Hsiao, 2021) for discussion of Southeast Asian contexts).

By 2020, recognition of these major environmental problems had become so mainstream that the UNDP human development report referred to the Anthropocene as its 'next frontier.'[2] Meanwhile, it has continued to function as a lightning rod for fundamental social and political, epistemic and ontological disagreements.

At one end of the spectrum, Earth Systems science and socio-ecological systems have used the Anthropocene as a platform for updating the old idea of *integrating knowledges* in a single, comprehensive system (e.g., Reid et. al., 2010). At the other end, critical social scientists depict the notion as incoherent and politically dangerous (Malm & Hornborg, 2014). Critiques of the Anthropocene are so widespread that one might by now speak of a minor genre in its own right. And somewhat to the side of this opposition, the Anthropocene has acted as a catalyst for attempts to think the new earth (Yusoff, 2015) in the environmental humanities (e.g., Rose et al., 2012; Gibson et al., 2015; Plumwood, 2012) and elsewhere (e.g., Cohen, 2016; Latour, 2018; Smith, 2018).

These diverse developments are indicative of a shared sense of the insufficiency of existing concepts and methods for tackling Anthropocene problems. But they evidently do not *complement* each other like pieces in a puzzle. To the contrary, they confront us with a series of starkly incongruent perspectives.

For some the Anthropocene names a universal planetary condition, which others view as blind to the co-existence of incongruent ontologies and more-than-human worlds. Some argue that the Anthropocene papers over colonialism and the violence of capitalist extraction, while others think it intensifies politics by rendering it ontological. To some the term is testimony to human hubris and arrogance. Yet to others, it operates as a profoundly anti-anthropocentric concept, which depicts an unprecedented situation of human vulnerability and diminished agency. Finally, as noted above, some use it as a clarion call for a true integration of knowledges, while it speaks to others of the need for sophisticated conjunctions of knowledge across a heterogeneous ecology of practices.

In each case, my perspective aligns with the second alternative. I aim to make my reasons clearer in what follows, but I can spell some implications out in advance. I am convinced that most modern conventions and dualisms leave us helpless to address Anthropocene challenges. A profound transformation of our ecologies of knowledge and practice are required to nourish cosmo-ecological alliances (Despret & Meuret, 2016; Prigogine & Stengers, 1984) capable of thinking the new earth (Yusoff, 2015). In light of the increasingly manifest inadequacy of existing theories, tools, methods, and concepts, collective speculation and experimentation *across significant difference*—from indigenous collectives to urban design, and geology to fiction—is urgently needed to stave off catastrophe (Stengers, 2015) and *do better* in the relatively near future.

[2] See http://hdr.undp.org/sites/default/files/hdr2020.pdf. Among other things that would have been inconceivable only a few years ago, the report argues that Amartya Sen's enormously influential capability framework is inadequate to the Anthropocene, which is better understood by reading Bruno Latour, Donna Haraway, and new materialism.

I return to these points repeatedly in what follows, and in the conclusion. But to begin, I sketch some of the major Anthropocene sticking points from the geo- and eco-sciences into social science and the humanities.

A Geology of 'Mankind'?

As noted, 'the Anthropocene' aimed to capture the unprecedented impacts of human activities on earth and atmosphere. After the initial publication, Crutzen's (2002) "Geology of Mankind," which came out in *Nature*, promoted the term. It gained further popularity with pieces like Will Steffen et al.'s (2007) "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" and Jan Zalasiewics et al.'s (2011) "The Anthropocene: A New Epoch of Geological Times?" As a new epoch, the Anthropocene would replace the Holocene, which had so far encompassed the entire history of 'mankind.'

In brief, the story went like this. Around the time of the Holocene some 11.500 years ago, agriculture began in the Middle Eastern 'fertile crescent' and gradually extended towards Europe. This "change from hunting to cultivation" (Zalasiewics, 2011, p. 836) is readable from the fossil record, and the first human-made spikes in C02 levels are due to early forest clearing. Agriculture made it possible for larger groups to live together in villages and towns. By the late medieval period, urbanization was relatively advanced and some cities were quite large. Later, the industrial revolution gave rise to massive population growth. By 1800, the planet had around 1B people, by 2000 there were 6.5B, and by 2050 there may be 9B. There are now numerous mega-cities with more than 20M inhabitants and their growth does not seem to be slowing.

Over time, more and more radical interventions in the landscape—today often referred to as 'terraforming' (originally a science fiction term)—was needed to support these huge urban conglomerates. But they turned out to also radically interfere with earth and water systems, leading to land erosion, lowered water tables, and disrupted sedimentation patterns. Such disruptions are characteristic of the Anthropocene.

Although mega-cities may appear more or less timeless, Jan Zalasiewicz et al. (2011, p. 836) argued that they will likely be impermanent compared with less immediately visible biological and chemical signals left by humans. For example, rising C02 emissions lead to increasing ocean acidity. Among the effects are coral bleach and declining plankton populations. Since plankton are at the bottom of ocean food chains, marine biodiversity will decrease, and this will "produce a distinctive event in the future fossil record" (p. 836).

The general implication of all this, as summarized by the geographer Noel Castree (2014, p. 439), is that

> *"Earth has endured changes sufficient to leave a global stratigraphic signature distinct from that of the Holocene … encompassing novel biotic, sedimentary and geochemical change. These changes, though likely only in their initial phases, are sufficiently distinct and robustly established for suggestions of a Holocene–Anthropocene boundary in the recent historical past to be geologically reasonable"*

In conceptual terms, we might describe the Anthropocene as marking the definitive end of the time when the creative and aspirational endeavors of people could be "projected against a stable natural environment" (Strathern, 1995, p. 424). The anthropologist Marilyn Strathern wrote those words in quite a different context, but their relevance is only intensified in the Anthropocene where the "natural environment" is recognized to be highly unnatural and very unstable *due to* human activities.

Within geology, debates about the Anthropocene have revolved around timing and the

relative robustness of stratigraphic markers. Suggestions have included lake sediments, greenhouse gas concentrations, and artificial isotopes produced by nuclear detonation (Castree, 2014, p. 439).

Outside geology, however, the dramatic highlight that "human impacts on the Earth's surface of such magnitude, scope and scale as to present an existential threat" (Castree, 2014: p. 437) contributed to the wildfire spread of the term. The fact that the motor of climate disruption was "human behavior, particularly in social, political and economic spheres" (Zalasiewics, 2011, p. 838) made the Anthropocene relevant to an exceedingly heterogeneous set of practices.

Some proceeded to identify planetary boundaries—from the aforementioned ocean acidity to nitrogen and phosphorous cycles and ozone density—in order to ensure that a "safe operating space for humanity" can be maintained (Rockström et al., 2009, p. 472). Many other who had little invested in the formal definitions of geology—from social science departments to art collectives, and from speculative designers to indigenous groups—were deeply involved with other kinds of problems and relations at the thresholds of natural and cultural worlds. By 2014, Noel Castree could confidently describe the Anthropocene as new, polysemous 'keyword' in the sense of Raymond Williams (1981).

Travels and Translations

As the Anthropocene travelled from the geo- and environmental sciences into the wider world, it attracted new meanings and interpretations. Controversy and interest no longer centered on the specificity of markers enabling differentiation from the Holocene, but rather on what the Anthropocene made visible and invisible about current, unsustainable, modes of inhabiting the planet.

What happened therefore went quite beyond science communication, conventionally understood as a neutral process of disseminating facts from the harder natural sciences into public culture. Quite differently, the travels of the Anthropocene can be described as a series of complex movements, trials and tribulations, in a heterogeneous ecology of knowledges and practices, each absorbed by its own particular concerns. In consequence, traffic quickly became multi-directional. Significantly, as we shall later see, there are also reverse flows from diverse sociocultural fields back into the geosciences.

Noel Castree (2014, p. 443) observed that the spread of the Anthropocene "helped normalise the idea that certain human actions can significantly transform environmental processes at a global scale and with enduring effects." In the English-speaking world, this 'normalization' occurred from the early 2010s onwards through a series of high-profile features in publications like *The Economist* (May 2011), *National Geographic* (March 2011)*, The New York Times* (December 2011), and *Time Magazine* (2012) not to mention a four-part television series by the English BBC. Around the same time, the environmental journalist Mark Lynas (2011) published the best-selling *The God Species*, which argued that the human species had to learn to use its supposedly god-like powers wisely.

Simultaneously, the Anthropocene exploded as a matter of concern across the social sciences. The following entries from the middle-decade offer illustration of the vigorous debates to which the term gave rise in geography, anthropology, history, philosophy, cultural theory and elsewhere (e.g. Davis & Turpin, 2015; Haraway et al., 2016; Lorimer, 2015; Malm & Hornborg, 2014; Swanson, Bubandt & Tsing, 2015; Wark, 2015). Not coincidentally, climate fiction gained traction as a rubric during the same period (e.g., Bacigalupi, 2009; Ghosh, 2016; Jensen & Kemiksiz, 2019; Robinson, 2020; Sudbanthad, 2019; Trexler, 2015).

Castree (2014) saw two central reasons for the ascendance of the Anthropocene as a cultural keyword. First, the term posits a world where multiple, disjoint actions have emergent, unpredictable, and cascading effects at many different scales up to the whole earth. This evoked

a need for enhanced forms of inter- or trans-disciplinarity, which were felt both within the natural sciences and the humanities. Second, the term underscores that "man" is the great transformer and destroyer of "natural" worlds but it *intensifies* the stakes of this well-known observation. Because with the Anthropocene even apparently localized environmental destructions are no longer bounded by their context of occurrence. We already know of the sad, infinitely growing list of cases: *this* lake being ruined by pollution and *that* forest being cut down. But now every dynamited mountain and melting glacier feeds into, and becomes a symptom of, planetary environmental malaise. The Anthropocene thus projects a uniquely stark image of planetary urgency.

This facilitates a characterization of the Anthropocene as a gigantic device for spinning out uncertain futures. Since we are all part of "it," and because it will affect all of us in many or all dimensions of existence, it encompasses issues that are at once social and cultural, economic and political, aesthetic and ethical.

From one side, Earth Systems science and socio-ecological systems research began to update earlier aspirations to integrate knowledge about the planet's interlocked system in a coherent whole (e.g., Reid et al., 2010; see also Jensen & Morita, 2020). More recently, Critical Zone research (Brantley et al., 2017) has begun to spill over into the social sciences and arts (Latour & Lenton, 2019; Latour & Weibel, 2020).

From another side, calls to rethink multispecies relations has garnered widespread interest (e.g., Rose et al., 2012; Gibson et al., 2015; Plumwood, 2012). The terms chosen for ongoing activities at Chiang Mai University—a Transformative Humanities lecture series organized under the Integrative Center for Humanities Innovation—offer another illustration. They index the necessity of rethinking disciplinary and research practices in an uncertain world.

However, the two sides are not exactly balanced and complementary. While the first tends to assume the existence of a single natural world, the second examines divergent practical ontologies and many co-existing more-than-human worlds. And while the question of responsibility—assumed, though sometimes wrongly, to be lacking in natural science discussions—remains central to social science and humanities discussions, the latter also raise urgent questions of what Donna Haraway (2016) has called response-ability.

Response-ability can be seen as a particular manifestation of the forward-looking inclination of Anthropocene discourse, which was also noticed by Castree (2014). Others have observed that uncertainty and diffuse future implications turns the Anthropocene into something like a science fiction concept (Swanson, Bubandt & Tsing, 2015). This future-orientation, moreover, resonates with the recent rise of diverse speculative modes of inquiry across various practices in social science (Wilkie, Savransky & Rosengarten, 2017; Clark & Szerszynski, 2021), education (Gasparin et al., 2020; Menashy, 2020), philosophy (Debaise, 2017), anthropology (de la Cadena & Blaser, 2018; Escobar, 2018) and design at large (Dunne & Raby, 2013). Experiments range from new transdisciplinary formations like the aforementioned critical zones (Latour & Weibel, 2020) to speculative crossings of fiction, theory, politics and practice (Auld & Jensen, 2022; Jensen, 2018).

This alignment strikes me as far from coincidental. Because what the Anthropocene makes abundantly clear across the spectrum is that a great many cherished concepts, methods, and tools simply are *not up to speed* when it comes to dealing with swiftly changing ontological conditions (Blok & Jensen, 2019; Jensen, 2020). Accordingly, these divergent practices can be seen as forerunners or advance attempts to respond what I will call a cosmo-ecological challenge.

In a characterization with strong Spinozist overtones,[3] Vinciane Despret and Michel Meuret (2016, p. 35) described cosmoecology as premised on "learning attentiveness to the infinite ways of being affected [by] and of affecting" more-than-human worlds on a damaged planet. The issues are ecological, to be sure, but we are no longer sure just what exactly ecology covers, who inhabits our ecologies, or how. And this is why the challenge evokes questions pertaining to the *cosmos*. Which kinds of worlds are we actually, currently inhabiting? Which ways of being affected and affecting are being destroyed by how we live at this very moment? And, crucially, which more or less livable worlds are under preparation—through our consumption patterns, modes of habitation, and socio-economic practices and forms of government—for the many other beings who will follow us?

Through the Rabbit Hole

While the Anthropocene entered the social science and humanities in force over the last decade it unsurprisingly proved neither convincing nor appealing to everyone.

A major controversy revolves around the issue of *universality.* Because it seems clear that the Anthropocene trades in some kind of *oneness*. There is, after all, only one earth, and current catastrophic transformations are due to one species, namely our own, 'the human.' At the same time, this tendency to planetary and species homogenization goes directly against the appreciation of cultural diversity and recognition of socio-economic inequality, which is at the heart of much social science and humanities scholarship.

A decade ago, the major points of contention were examined by the historian Dipesh Chakrabarty (2012) in the influential article "Postcolonial Studies and the Challenge of Climate Change." He contrasted the Anthropocene with the notion of globalization, which held enormous intellectual interest and popular appeal until quite recently. When globalization first arrived on the scene it also seemed to imply homogenization. The notion that everything and everybody would gradually become more or less similar was popularized with slogan-concepts like 'McDonaldization' and 'Coca-Colonization.' But soon scholars realized that globalization could be opened up to a multiplicity of incongruent practices and processes. Globalization could have totally different implications in different contexts. Even McDonaldization turned out not to be the same thing in Denmark, Japan, and Thailand.

But it is relatively more difficult to open up the Anthropocene to difference. Contrary to capitalist expansion—like that of McDonalds—which can be recognized to take different forms in different cultural contexts, you are not going to find a second, different planet no matter how hard you look. Short of an implausible Elon Musk-style trip to Mars, there is no escape from planetary boundaries, and crossing them means to risk species extinction. Accordingly, a species-level perspective is deeply embedded in the Anthropocene worldview that emerged from the geo- and eco-sciences. The destructive agent is the human collectivity at large "whose commitment to fossil-fuel based, energy-consuming civilization is now a threat to that civilization itself" (Chakrabarty, 2012, p. 2).

Evidently, this abstract, homogenous humanity is anathema to the many cultural, political, social, religious, historical, and literary scholars who specialize in diverse forms of diversity. And to make matters worse, this group of researchers immediately pointed out that only an outrageous *neglect of diversity* would lead one to think that the runaway Anthropocene had been caused by 'humanity.' Indeed, ascribing responsibility to an undifferentiated humanity goes against everything on historical record, because the major Anthropocene culprit is only a small *sub-set* of people. And that sub-set is quite easy to identify: we are talking about *colonialists and capitalists* (Malm & Hornborg, 2014).

[3] Spinoza famously insisted that "no one has yet determined what a body is capable of." Cosmoecology aims to do a better job.

We may talk about a 'great acceleration' into the Anthropocene. But then we must also speak of the imperial and colonial extraction of resources that *fed it*. Sometime in the aftermath of WWII, industrial acceleration picked up and it eventually spun completely out of control in the deregulated neo-liberal world order. To speak of the Anthropocene is obfuscation, when we ought to speak plainly of the Capitalocene.

I am paraphrasing Chakrabarty paraphrasing the Capitalocene critique. But he is not entirely convinced (and neither am I). It might be objected that replacing humanity in general with capitalism in general merely pushes homogenization one level down. But Chakrabarty's view is not really that the Capitalocene diagnosis is *wrong*. It is rather that it is partial and limited, or limiting, for reasons that become clear if we consider the future effects and implications of global environmental change. Chakrabarty writes that the modern, industrial way of life "has acted much like the rabbit hole in Alice's story" (Chakrabarty, 2012, p. 217).

At the far end of the tunnel, the logic that seemed operational on the upside no longer applies in the same manner. In particular, even if critical examination of the history and structure of capitalism and colonialism provides a convincing explanation of the emergence of the Anthropocene, it isn't similarly illuminating of the requirements and obligations of existence in a destabilized, upside down world.

To repeat, it is obvious that this destabilization is not the historical fault of most of Earth's people (not to mention 'humanity' as such). Who could disagree? Today, it has become possible to debate whether China and India should be added as "prospectively guilty" (Chakrabarty, 2012, p. 216) climate sinners due to their unwillingness to curb CO2 emissions. If unfolding discussions about past and prospective responsibilities are usually so heated it is because they may lead to demands for redress likely to become exponentially more expensive over time.

Even so, in cosmo-ecological terms, such questions of culpability are less consequential than the epochal realization that our more-than-human worlds now exist at the mercy of unstable planetary boundaries that could not care less about the differences between political ideologies like anarchism and fascism, Marxism and neoliberalism.

It follows that the Anthropocene requires reorienting to a dangerous, decentered future. It may very well be that Capitalism, as it has evolved over the last centuries, and as we know it today, will also go extinct. But that is far more likely to happen due to planetary destabilizations beyond human control than as a result of some extra rounds of critical debunking.

What is most urgently needed now, therefore, is alternative forms of collective experimentation in support of learning how to think and re-inhabit the new, fickle earth.

The (Im-)Balance of Agency

Much environmental writing emphasizes *the destructive powers of human agency* with a view to curtail them. There is an obvious alignment with the Capitalocene diagnosis, which simply adds that devastation has historically been an overwhelmingly Euro-American business. However, to environmental entrepreneurs the situation looks quite different.

This group is not comprised of 'deniers.' But while they acknowledge that climate change is occurring, their favored solution is to make capitalism sustainable. Think 'green growth.' The so-called ecological modernists affiliated with the American Breakthrough Institute go so far as to argue that geo-engineering—experimental technological modifications of oceans and the atmosphere—can *improve* the climate, paving the way for a 'good Anthropocene.'

One reason why it is relevant to consider this position of extreme techno-optimism is that it more or less resembles the view many critics have of the Anthropocene discourse *in general*. In other words, the argument for the 'good Anthropocene' is merely the Anthropocene

showing its true colors. As such, it simultaneously exhibits the danger and arrogance of depicting 'humanity' as a god-species (Lynas, 2011) capable of wisely managing the whole planet and makes explicit that this so-called humanity in fact consists only of technologists and entrepreneurs—the ecological modernists—themselves.

At a first glance, the conflation of the Anthropocene in general and the 'good Anthropocene' appears plausible because Paul Crutzen (2006) infamously ended up speaking for geo-engineering. But a closer look tells quite a different story, which is very instructive when it comes to figuring out who *might turn out to be* cosmo-ecological allies and who are certainly not.

The political scientist Clive Hamilton (2013, p. 15) has described the context of climate science prior to the Anthropocene as follows:

"*In the 1990s proposals for geoengineering were regarded by the mainstream as fanciful and a distraction from the real task of reducing emissions… almost all climate scientists took the view that the availability of an alternative to cutting emissions, even if manifestly inferior, would prove so alluring to political leaders that it would further undermine the will to do what must be done. To canvass climate engineering, let alone advocate it, would be unethical."*

From this synopsis we learn two things. First, climate scientists viewed geo-engineering as more dangerous than the problems it might solve. Second, their faith in the 'god-like' capacities of businessmen and entrepreneurs was so slim that they kept mum about the real possibilities, waiting for emissions to be cut.

And then…nothing happened. Reductions were continuously postponed due to political inaction and corporate obstruction. All the while, predictions from climate models grew more and more alarming. This was the background against which Paul Crutzen (2006) caved in and argued that sooner or later geo-engineering would have to be seriously considered.[4]

Although Crutzen wrote about the Anthropocene and geo-engineering, the context and argument were therefore radically different from the ecological modernists. While the latter arrogantly present themselves *as* the green capitalist earth-masters of the future, the former only considered geo-engineering as a result of the climate inactivism *by* the same groups who would like, today, to wear the robes of 'god-species.'

We can once again briefly return to Chakrabarty, who acknowledged that Anthropocene syndromes *so far* are largely due to human (capitalist) agency. But the crucial point is that what they have set in motion are run-away effects beyond their own control. What has emerged with the Anthropocene is thus a world of shifted and *diminished* human agency.

It is also crucial to notice that this sense of diminished agency does not create an *inherent opposition* between Anthropocene geo- and eco-scientists and those in the social sciences and humanities oriented to more-than-human worlds (Blok & Jensen, 2019). Across many relevant contrasts and important differences, a recognition of complex planetary interdependencies at multiple, interwoven scales is partially shared.

This suggests the need for a speculative and pragmatic *reset*. If the aim is to shape sophisticated conjunctions of knowledge and practice, it is counter-productive to start by

[4] Various more or less wild proposals for engineering the climate have been making the rounds. Some focus on removing carbon dioxide from the atmosphere and depositing it in underground quarries or oceans. Others suggest cooling the planet by solar radiation management, which means reflecting solar radiation back into space. These ideas share the assumption that scientists are sufficiently knowledgeable of global environmental processes to modify them, and capable of doing so in safe, controlled ways. Given our climate track-record so far, there is plenty of reason to doubt those assumptions.

reinforcing the deadening opposition of mutually opposed disciplinary cultures (Snow, 1993). To think the new earth requires finding new allies *in heterogeneity*.[5]

Thinking the New Earth

In the mid-nineties, a few years before the naming of the Anthropocene, the anthropologist Marilyn Strathern (1995, p. 433) observed that the concept of culture appeared increasingly problematic. It could no longer to be taken for granted. This was the time of an earlier round of (Euro-American) 'culture wars.' Conservatives worried (as they still do, some things never change) about the breakdown of 'traditional values' and the pollution of youth, who had come to believe in fluid identities after reading too much postmodern theory.

What Strathern had in mind was quite different. Her ethnography of reproductive technologies led to the observation of growing capacities to *breach the difference* between nature and culture. Techniques and methods like *in vitro* fertilization, gamete donation and maternal surrogacy created new questions and uncertainties about kinship and family relations. It was no longer obvious where nature started and culture stopped. It was perhaps not even obvious if those categories made sense.

Although those observations had nothing to do with global climate change or planetary processes, Strathern's description of culture as deeply "problematized" is extremely pertinent, since the Anthropocene is precisely defined by 'cultural products' having breached every part of 'nature.' Think microplastics embedded in rock layers, found inside fish bellies, or atop mountain peaks.

Yet, here is a cause of much confusion. Because as previously noted, the Anthropocene is *also* critiqued for maintaining the same distinction between nature and culture.

The critical argument goes roughly like this. Anthropocene discourse assumes that when humans dump garbage at a beach, they are doing something cultural to something natural. Nature is precisely the non-human environment that humans do things to. When plastics are found in rock formations, nature has become fully cultural. This elevates humans to their presumptive status as earth masters. But it also retains the idea of a fundamental difference between humans and the rest of the world, or between culture and nature. What is thereby missed is that humans (and everything else) are constitutively shaped by their relations with many other things, which means that there is no fundamental difference between 'nature' and 'culture' in the first place.

Irrespective of whether this accurately depicts the assumptions of Anthropocene natural scientists, it can be observed that quite a few social scientists take this argument as another reason to avoid the term. For some others, however, the problematic status of nature-culture relation provides an occasion to rethink the Anthropocene in more emergent and interactive — and so non-dualist—and more inventive, generous, and encompassing—and so nonreductive, ways (e.g., Yusoff, 2018). The literary theorist Timothy Morton (2014) has gone full monty (cf. Gibson-Graham, 2006, p. 10), comparing himself to the mad scientist Dr. Strangelove in an explanation of how he "learned to stop worrying and love the term *Anthropocene*."

The impetus behind Morton's declaration of love is to push us to think beyond the human. But—you might well wonder—isn't that exactly the *inverse* of the critical view? Wasn't the whole point of this critique that the Anthropocene elevates the human perspective to cover everything? And you would be right.

[5] With reference to Gilles Deleuze (1994, p. 23), who wrote that "We learn nothing from those who say 'Do as I do'. Our only teachers are those who tell us 'do with me', and are able to emit signs to be developed in heterogeneity rather than propose gestures for us to reproduce."

But Morton disagrees (and so he aligns with Chakrabarty). Yes, for sure, the Anthropocene was caused by *certain people*, not by some dubious humanity. Yet, even if the seeds were sown by violent colonialism and imperialism, Anthropocene causes and effects are *now* more evenly distributed. Many people all over the world have by now achieved, or are busily working towards, opulent, unsustainable 'modern' lifestyles. Think *Crazy Rich Asians*. Think 24-7 air-conditioning. Think *Siam Paragon*.

But the crucial point, again, is that the Anthropocene has gained a momentum of its own. It is significantly beyond human *control* (though not beyond some kind of influence, or we might just give up). This means that ideas like earthmasters or god-species have to be inherently ridiculous to anybody who is serious about the Anthropocene. If you want proof of ridiculousness, look no further than large-scale capitalist and socialist modes of production in the last century. They were technologically advanced societies. They drew on the highest level of scientific and organizational expertise available. And the reason why we now permanently inhabit the Anthropocene is *because of* the massive bungling, ignorance, greed, and stupidity of these societies doing those things in that period. The supposed 'god-species' was so appallingly dumb that it started a process of planetary destabilization, which will make people *more vulnerable than ever before for an indefinite period of time.*

Morton is not, of course, in love with the threat of destruction. Instead, he is pushing readers to take on board that human-centered thought styles, forms of critique and inquiry, come up short when confronted with cosmo-ecological issues (Jensen, 2020). The sixth mass extinction will not be stopped or mitigated by critiques of capitalism, by deconstructions of nature-culture dichotomies, by proofs that environmental policy-making is socially constructed, or by genealogies of the biblical imaginary at the heart of geo-discourse. As Clive Hamilton (2013, p. 199) asked of geo-engineering solutions to Anthropocene problems, "how can we think our way out of the problem when the problem is how we think?" Morton's provocative declaration of love helps us think our way out of the problem by supporting decentered practices that begin with cognizance of interconnections and fragility.

Rather than human-centered and hubristic, the Anthropocene thus emerges as "the first truly anti-anthropocentric concept." Kathryn Yusoff (2015, p. 5) calls it a "new password." But what is it a password to? Which speculative and pragmatic pathways to cosmoecology does it open and close?

Two avenues, to which I have already alluded, suggest themselves. One posits the need for integrated earth systems science and socio-ecological systems, and orients to multi-level environmental governance (see also Jensen & Morita, 2020). Another, more diffuse and open-ended, comprises diverse interests in more-than-human worlds and indigenous knowledges (Escobar, 2018; Whyte, 2018), sustainment design (Fry, 2009), maker movements (Morita & Tsuda, 2022), and degrowth (Hickel, 2020). Emergent and disjunctive, the latter share awareness of the deep entanglements of "geopolitical formations" and "the mobilization of earth forces" (Yusoff, 2015, p. 6).

What is less easily captured are tangled trails and lateral traversals of the whole spectrum.

The Anthropo-Not-Seen

As we have seen, the Anthropocene gives rise to radically different interpretations within Western academic discourse. There is scarcely any agreement on what the concept entails in terms of relations between different peoples, contexts, and periods, or as regards relations between humans and other living beings and nonhuman entities. And once we take leave of the modern West divergences multiply. In the same move, the question of what is required to think the new earth(s) morphs and expands.

An excellent entry point is provided by the anthropologist Marisol de la Cadena (2015b) who observes that a dualism between nature and culture simply is not operative in much of world. In Japan, for example, the distinction between nature and culture is quite dubious and unstable (Jensen & Morita, 2017). Déborah Danowski and Eduardo Viveiros de Castro (2017) elaborate analogous problems in the Amazon context and elsewhere.

Now with reference to Morton's love of the Anthropocene, we might reply "ok, but actually the Anthropocene also does not necessarily entail that dualism." But in a way this hardly matters for de la Cadena's argument. Because no matter what it entails, there are vast differences between the Anthropocene imagination and the variable cosmologies on the planet. If the Anthropocene has significant difficulties getting a hearing in Japan, or among indigenous North American collectives, it must be because it fails to resonate with their conception of what the world is like *in some important sense*.

However, just as dismissing the Anthropocene 'because Capitalism' is to move too quickly, discarding the notion because it is unable to encompass the divergent cultural and cosmological worldviews of the whole planet also seems incautious. (Of course, if it did try to encompass them, we would have to immediately prepare for a new critique of false universalization. In a way, you can't win). We are once again required to hold two mutually destabilizing thoughts *together*. Yes, it is true that nature-culture dualism is unworkable. Practical ontologies are radically variable. *And*, yes, at the same time it is *also true* that changes ripple across a single planet with ramifying, divergent consequences for all the humans and nonhumans collectives populating it.

This means that the relation between cosmoecology and the Anthropocene is one of complication rather than refutation. And one crucial way this works is by focusing attention on the innumerable processes and relations between more-than-human entities that slip through the cracks because they do not conform to binaries, including, but also going beyond, nature and culture. For example, the relations some people have with *earth-beings*, which are precisely *not* natural mountains (de la Cadena, 2015a), or with spirit anacondas dwelling in Amazonian rivers (Hugh-Jones, 1979), which are *not* normal, natural animals, just as *nagas* are not.

From a modern perspective, this sounds confused, superstitious, or merely silly. But once the requirement that everything under the sun must be slotted into either nature or culture is suspended it becomes possible to learn of other differences and alternatives from the stories and practices of non-modern people. It becomes possible to take on the challenge of learning how to live *well* in more-than-human worlds. Among other things, that means learning how to co-exist with nonhumans in *non-abusive* relationships.

Marisol de la Cadena (2015a) characterizes this as the challenge of the *anthropo-not-seen*. She does not *disregard* plastic pollution on beaches, skyrocketing C02 emissions, or other things that are easily recognizable as Anthropocene. However, she complicates the story by adding heterogeneous, world-making processes from the far side of nature-culture and human-nonhuman divisions.

Leaders of the Awajun-Wampi, for example, describe the destruction of their world by invoking siblingship with the Amazon: "The river is our brother, we do not kill our brother by polluting and throwing waste on it."

From a modern perspective, the real issue is obviously industrial pollution, since the river isn't actually your brother. Once the story has been corrected in this way, it fits right into the Anthropocene narrative, according to which the great acceleration was made possible by a violent disregard for natural environments. But for the Awajun-Wampi, the Anthropocene re-description fails to recognize the fundamental point, which is precisely that what Westerners call rivers, plants, and animals are not nature in the first place. Because they are kin. And it is

because they are kin that it is unthinkable to treat them as mere ecosystems services or extractive resources. The obligations are entirely different and much more demanding.

De la Cadena characterizes the situation by saying that anthropo-not-seen responses like those of the Awajun-Wampi are called forth by the nature-culture distinction (e.g., via what Westerners call industrial pollution) but also exceed it. And it is due to this excess that their responses can challenge the notion that we all live in the same world; a modern "one-world world" (Law, 2015).

What is brought to light by the anthropo-not-seen, then, is not the irrelevance of the Anthropocene but rather the need to keep it open to a multiplicity of practical ontologies; a world of many worlds (de la Cadena & Blaser, 2018). New alliances for taking care of the possible and thinking the new earth are sorely needed.

New Alliances

Cosmo-ecological alliances in a world of many worlds clearly cannot be premised on a hierarchy of knowledges with natural sciences on top and cultural ones below. But a reversal of the hierarchy offers no more of a solution. Unless some kind of communication across significant difference is established mutual learning is impossible. Accordingly, we need better, non-hierarchical images, like Isabelle Stengers' (2005) "ecology of practices" or Michel Serres' archipelago of islands partially connected by bridges, articulations and conjunctions made from many materials, and open to movement in many directions.[6]

Isabelle Stengers offers a simple, effective illustration. Rather than imagining the relation between indigenous people and climate scientists through the conventional opposition between lived experiences (and fanciful narratives) and objective calculations—which has the immediate consequence of making their knowledges appear mutually irrelevant or opposed—she observes that it is because of models running on more and more powerful computers and observational data … [that] the many diverse disruptions already witnessed, by Inuits, Amazonians or fishermen of Capetown are now to be recognized as having nothing transitory about them, as referring to the same ongoing process, bound to affect all and every people on this earth, human and nonhuman[7]

In other words, heterogenous knowledges, some embedded in models, some in narrative, can be *brought together* in new alliances. Each lends power to the other without being 'reduced' or losing distinctiveness.

In the hands of the anthropologist Heather Swanson (2016), the controversy about the starting point of the Anthropocene provides another illustration of sophisticated conjunctions and possibilities of alliance.

"Defining the Anthropocene" (Lewis & Maslin, 2015) published in *Nature* examined several attempts to determine the most appropriate starting point for the epoch. Some scientists drew on archaeological evidence to argue that it all began with the first agricultural revolution around 10.000 years ago. Others argued that a starting date symbolically evoking the Industrial Revolution—the invention of the steam engine, say—would make more sense. Some preferred the mid-twentieth Century, the time of the "great acceleration" and hockey stick curves, while others viewed the first nuclear explosion as uniquely appropriate. Lewis and Maslin, however, were particularly intrigued by evidence brought to light by the environmental historian Alfred

[6] "I believe that these spaces *between* are more complicated than one thinks. This is why l have compared them to the Northwest Passage [in *Hermès V. Le Passage du Nord-Ouest],* with shores, islands, and fractal ice floes. Between the hard sciences and the so-called human sciences the passage resembles a jagged shore, sprinkled with ice, and variable. Have you seen the map of northern Canada? Once again the path of this passage strangely resembles what l earlier called the fly's flight pattern. It's more fractal than truly simple. Less a juncture under control than an adventure to be had. This is an area strangely void of explorers" (Serres & Latour 1995, p. 70).

[7] Available at https://osmilnomesdegaia.files.wordpress.com/2014/11/isabelle-stengers.pdf.

Crosby (1972) about the conquest of South America.

Crosby used the innocuous term the "Columbian Exchange" to refer to "mass movement of animals, plants, and pathogens among continents that began with the wave of exploration and exploitation that followed Columbus' initial voyage" (Swanson, 2016, p. 160). It is probably not immediately evident what this has to do with dating or defining the Anthropocene. The connection is that this 'exchange' led to "a swift, ongoing, radical reorganization of life on Earth without geologic precedent" (Lewis & Maslin, 2015, p. 174).

Without geologic precedent? Yes, because the mass killing of the Indians led to the collapse of their vast, advanced, agricultural systems. Today, this *genocide can be read from the atmosphere* as decreasing global CO2 levels in the aftermath when forests expanded once again (Swanson, 2016, p. 160; Lewis & Maslin, 2015, p. 175).

The central point here is obviously not whether or not the 'Columbian exchange' is really the ideal starting point for the Anthropocene. Instead, the debate vividly illustrates a conjunction of knowledges the sophistication of which is precisely in its escape from the cliched opposition between natural and cultural domains.

Contrary to those who imagine all scientists to be indifferent to anything beyond their immediate specialization, we have here a debate that draws on archaeology, environmental history, and studies of colonial genocide. And contrary to those who criticize the poverty of the Anthropocene political imagination we encounter scientists fully aware that decisions about the starting point carries a heavy weight. If the Anthropocene is pushed so far back that it almost coincides with the Holocene, this will help promote the narrative that global environmental changes are really *nothing new*. The climate has always changed, as they say. Change is normal, *see,* so there is nothing particular to worry about.

In contrast, a starting point with the 'Columbian exchange' makes the Anthropocene connection with conquest, extraction and violence explicit. And defining the onset as the industrial revolution makes assigning responsibility to capitalists particularly easy (Lewis & Maslin, 201, p. 171). Politics is already internalized in scientific Anthropocene debates and the debaters know this.

Of course, the example is not perfect. It offers little in terms of the de la Cadenas's anthropo-not-seen or the divergent obligations to more-than-human worlds of indigenous and other non-Western, non-modern collectives. Even so, it gestures at the potentials of a new Anthropocene political ecology and "new forms of scholarly practice" (Swanson, 2016, p. 162). But to avoid reintroducing the dualism between culture (as politics) and nature (as ecology) better to speak of new cosmo-ecological alliances and more-than-human worlds.

A Cosmo-Ecological Invitation

It has been a long journey. Where have we ended? Let me conclude with two summaries and an open-ended invitation. And let me preface by saying that the relative complexity of the preceding is a consequence of the argument for cosmo-ecological alliances.

That argument is that to heed Yusoff's (2015) call to think the new earth it is not good enough to mark one's territory on one or other side of a conventional disciplinary or political divide. Knowledge hierarchies are part of the problem, and parallel pathways, no matter how interesting in their own right, inhibits collective learning and mutual challenge. Rather than an occasion to prolong trench warfare with dear old enemies, the Anthropocene creates the possibility, and indeed obligation, to experiment with and nurture new alliances. This is why, rather than criticizing particular approaches from a fixed, extant vantage point I have also presented speculative, mobile articulations and conjunctions.

There are plenty of signs of the existence of alliances that gain strength from lateral moves between divergent practices and knowledge. 'Defining the Anthropocene' offers an illustration. The trans-disciplinary version of critical zone research (Latour & Weibel, 2020) is

another example, to which can be added the conjunctions of indigenous mobilizations and design explored by Arturo Escobar (2018), and assorted speculative formations across the board.

Given this diversity, the lack of definitive cosmo-ecological *criteria* and *specifications* on the preceding pages is also deliberate. We are all on the inside of the archipelago and I am not in a better position than everybody else to decide in the abstract what counts as a success. We don't know what it takes to learn attentiveness to the infinite ways of affecting and being affected, which is precisely why there is such a strong need to experiment and find out.

Nevertheless, I have worked with and through some significant contrasts. Any attempt to *universalize* or *homogenize* either the Anthropocene or any specific cosmo-ecological location is likely to spell trouble. We are in a world of many worlds, not one, and singularizing what is multiple unavoidably inhibits possibilities for recognizing the anthropo-not-seen of the shadows, gaps, and crevices.

Likewise, any view that elevates the powers of 'humanity'—or specific groups of people—to god-like status have no role in cosmo-ecological alliances. Thinking the new earth must entail learning from a ground-level position among (or with) other human and more-than-human actors. In lieu of arrogance, what must be nourished is awareness of mutual interdependencies, and a corresponding sense of humility.

Moreover, perspectives that purport to cleanly separate 'nature' from 'culture,' or presuppose that scientific knowledge is outside politics cannot easily be squared with cosmoecology because such assertions imply the superiority of their own worldview, which in turn blind them to the ramifying social and political implications of their actions. Finally, the endpoint is not—cannot be—an integrated system for thinking the new earth. This earthly archipelago is comprised of a multiplicity of practical ontologies. It is a world of many worlds, many of which are endangered. The cosmo-ecological challenge is to collectively draw sufficient strength and imagination *from difference* to learn how to think, nourish, and re-inhabit these endangered worlds.

The rest is up for grabs. Now go!

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