


# The Paradox of Anthropocene Inaction: Knowledge Production, Mobilization, and the Securitization of Social Relations

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This article argues that the Anthropocene produces a paradox when thinking about political mobilization. I show how the knowledge production practices that render the Anthropocene visible and actionable, including planetary boundaries, Earth System Science modeling of earth systems, and geological strata, also circulate a security rationality. This rationality is one that attempts to manage, co-opt, or productively direct processes of becoming, which limits possibilities for mobilization. A lens that assumes political mobilization is a function of increased knowledge, understanding, and evidence contributes to this problem. By starting instead with an understanding of possibilities for mobilization as emerging from social relations, the article highlights the way in which the security rationality circulated by Anthropocene knowledge production risks transforming those social relations into security relations. Netting the planet and the human together through the practices of calculation and representation that make the Anthropocene visible produces a decontextualized, disaggregated, and dispersed subject and so limits possibilities for collective political mobilization.

Cet article soutient que l'Anthropocène produit un paradoxe quand il s'agit de mobilisation politique. Je montre comment les pratiques de production du savoir, qui rendent l'Anthropocène visible et exploitable, y compris les limites terrestres, la modélisation de l'ESS des systèmes Terre et les strates géologiques, font également circuler une rationalité de sécurité. Cette rationalité tente de gérer, de s'appropriier ou de diriger de manière productive les processus de devenir, ce qui limite les possibilités de mobilisation. L'adoption d'un angle qui suppose la mobilisation politique constitue une fonction d'accroissement des connaissances, de la compréhension et des preuves qui contribue à ce problème. En commençant plutôt par envisager les possibilités de mobilisation comme émergeant des relations sociales, l'article met en évidence la manière dont la rationalité de sécurité diffusée par la production de connaissances de l'Anthropocène risque de transformer ces relations sociales en relations de sécurité. Tisser des liens entre la planète et l'humain par les pratiques de calcul et de représentation qui rendent l'Anthropocène visible produit un sujet décontextualisé, désagrégé et dispersé, et donc limite les possibilités de mobilisation politique collective.

Este artículo sostiene que el Antropoceno produce una paradoja a la hora de pensar en la movilización política. Mostramos cómo las prácticas de producción de conocimiento que hacen que el Antropoceno sea visible y accionable, incluyendo los límites planetarios, la modelización de los

sistemas terrestres mediante estrategias evolutivamente estables (EEE) y los estratos geológicos, también difunden una racionalidad de seguridad. Esta racionalidad intenta gestionar, apropiarse o dirigir productivamente los procesos de devenir, lo que limita las posibilidades de movilización. Una perspectiva que asume que la movilización política es una función de un mayor conocimiento, comprensión y evidencia contribuye a este problema. En cambio, al partir de una comprensión de las posibilidades de movilización como emergentes de las relaciones sociales, este artículo pone de relieve el modo en que la racionalidad de la seguridad puesta en circulación por la producción de conocimiento del Antropoceno corre el riesgo de transformar esas relaciones sociales en relaciones de seguridad. Relacionar el planeta y lo humano a través de las prácticas de cálculo y representación que hacen visible el Antropoceno produce un sujeto descontextualizado, desagregado y disperso, limitando así las posibilidades de movilización política colectiva.

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### Introduction

Media coverage of the Anthropocene offers stark warnings about biodiversity loss, extinction, and the destruction of nature (Lewis 2009; Moody 2015; Rees 2015). Climate strikes and formal declarations of “climate emergency” such as by the UK Parliament in 2019 echo this crisis framing. While we also see coverage and discussion of possibilities for change, management, and adaptation, the Anthropocene for many authors confronts us with what Bludhorn calls an “ecological paradox” in which we know what is going on but do nothing (Bludhorn in Rickards 2020, 126). Indeed, it can seem as though the enthusiastic adoption of the concept of the Anthropocene in academic, media, and popular culture debates far removed from its Earth System Science (ESS) roots is simply what Rickards (2020, 126) calls a “performance of seriousness.” Certainly, the seriousness of threats about extinction does not seem to map directly on to a radical overhaul of social and political structures of a similar magnitude. However, in this article, I propose that focusing on the “performance” itself shows that rather than “doing nothing,” the ways in which the Anthropocene is produced as crisis circulates a security rationality that operates in a diffuse way, has depoliticizing effects and works against possibilities for collective political mobilization.

On the one hand, claims about extinction, crisis, destruction, and a climate emergency would seem to call for an analysis in terms of exceptionalist securitizing or governance through logics of emergency (see, e.g., Anderson et al. 2020). Exceptionalist securitizing should lead to exceptional measures; emergencies are, as Anderson (2017, 470) argues, “activating” (see also Bonneuil and Fressoz 2017, 21). We see in claims about the Anthropocene, on this reading, either a lack or a failure of securitization. This is important because if the problem is that the Anthropocene has been insufficiently securitized, then the solution is to offer more persuasive articulations of the emergency we face in order to prompt action. Declarations of climate emergency at the level of local government and the UN, social movements such as Extinction Rebellion (XR) and Fridays for the Future (FFF), the “Climate Clock” launched in New York, and groups calling for emergency legislation such as the UK Climate and Ecological Emergency Bill all operate around these kinds of assumptions.

On the other hand, an optimistic analysis might suggest that keeping the Anthropocene off the security agenda means that the concept can function as a touchstone for reasoned political debate, engagement with scientific advances, and critical analysis (see, e.g., Smith 2011). In this vein, a number of authors caution against emergency framings, concerned that they will legitimate technological

interventions, depoliticization, or authoritarian social regulation (e.g., Clark 2014, 28–9). However, the Anthropocene is at present most often *not* framed in obviously security terms in nonacademic discourse but rather in scientific, technical, or creative terms<sup>1</sup> (see below for analysis of media coverage). Such a scientific framing of the Anthropocene would seem to offer greater potential for enhancing public understanding, meaningful debate, and action, but again, sufficient political mobilization seems not to have occurred.

Building on existing work that highlights the links between the Anthropocene and security rationalities (e.g., Fagan 2017), my argument here is that despite the lack of explicit securitization, the dominant deployment of and the knowledge production practices around the concept of the Anthropocene produce it as enmeshed in and contributing to the circulation of security rationalities. The Anthropocene concept, under the guise of an enlightened appreciation of the complexities of our relation with the planet, circulates a set of security rationalities across activist, scientific, media, cultural, and policy domains that engage with and seek to mobilize around the concept. Those rationalities turn the social relations that enable collective action into security relations that individualize, decontextualize and depoliticize. In short, the logics and rationalities that enable the Anthropocene to be intelligible, recognized, and understood in contemporary political life are precisely the things that make acting on it difficult.

There are two elements that need to be revisited in order to reinvigorate our thinking about the Anthropocene, security, and mobilization, and to contribute to explaining why warnings of planetary emergency do not result in significant political mobilization. Firstly, I argue that the Anthropocene is neither successfully mobilized in the service of exceptionalist securitizing through being framed explicitly in terms of threat or fear, but nor is it an effective political or scientific concept resistant to broader security logics. Drawing on a body of work that highlights the pervasive nature of security rationalities in contemporary social and political organization (Walker 1993; Dillon 2008; Huysmans 2014; Chandler 2018; Grove 2019), I suggest that in order to open up engagement with the Anthropocene and the response to it (or lack thereof), we also need to look at the more subtle ways in which the Anthropocene is enmeshed in security rationalities. While analyses of the extension of biopolitical logics of security to the nonhuman have indicated the way in which the measurement and monitoring of the environment makes it biopolitically governable (Grove 2010; Wolfe 2012; Youatt 2017; Rothe 2020), my focus is on the way in which Anthropocene knowledge production circulates security rationalities in a more diffuse way throughout society. In so doing, this article contributes to nascent work on how the Anthropocene concept itself governs (Youatt 2017; Hamilton 2018).

Secondly, I argue that the practices of knowledge production around the Anthropocene—the framing of the human as geological actor, graphical representation, the identification of boundary conditions, treating the earth as a planetary system, the scaling practices of geological timelines, and so on—circulate a specifically *virtual* security rationality that attempts to manage, co-opt, or productively direct processes of emergence and becoming (see, e.g., Dillon 2008; Chandler 2018; Rothe 2020). In particular, I will argue that while as critical approaches in the social sciences and humanities have noted (Bennett 2010; Clark and Yusoff 2017; Hamilton 2017; Latour 2017; Chandler 2018; Randazzo and Richter 2021), the Anthropocene can be usefully understood as bringing into view the disruption of familiar temporal, ethical, relational, spatial, and scalar categories, and so offering possibilities for the emergence of new forms of political community, its production

<sup>1</sup> Lövbrand et al. (2020) note exceptions to this trend, in which the Anthropocene is explicitly securitized in policy discourse—Angela Merkel’s speech to the Munich security conference in 2019, the Planetary Security Conference in the Hague, and the Centre for Climate and Security. Nonetheless, this remains a marginal framing.

also *manages* the disruption it brings into view. The virtual security rationality circulated through Anthropocene knowledge production targets specifically this ground of emergence. This matters for political mobilization because such management extends to the reduction of social relations that might otherwise foster the mobilization of new forms of political community to calculable, mappable, and decontextualized interaction.

This conceptually driven article first offers a discussion of political mobilization to argue that rather than a focus on crisis as motivating, a sociological approach indicates the need to look at mobilization instead as a function of social relations. The discussion then goes on to show how those social relations are constrained by the circulation of security logics in dominant productions of the Anthropocene. To do so, the second section shows how, despite the lack of an explicitly securitized response, the Anthropocene can be understood as securitized through association. Thirdly, the article offers an analysis of knowledge production practices around the Anthropocene in the light of this framework to show how those practices rely on and circulate a specifically virtual logic of security that seeks to manage emergence and becoming. Finally, the article examines the implications of its critique by showing how this attempt results in the production of the subject as dispersed and disaggregated, which limits the social relations necessary for collective political resistance.

### **Anthropocene Mobilization**

#### *Evidence, Knowledge and “Following the Science”*

There are a number of different arenas in which we might consider political mobilization in response to the Anthropocene. Responses range from ecomodernist and geoengineering approaches, state-level climate policy, and international institutions, to climate justice movements, the introduction of rights for nature, creative and cultural engagements, and local small-scale initiatives. However, as [Wright et al. \(2018\)](#) have argued, the first group of these tend to offer “business as usual” solutions, driven by global corporate capitalism ([Klein 2014](#)). If, as is becoming increasingly accepted, the Anthropocene indicates the need for a wholesale reorientation of social, political, and economic life away from fossil fuel capitalism (see, e.g., [Burke et al. 2016](#)), it is the latter group that might offer more useful resources. These rely on attempts at reimagining political community, with social movements around climate change as the most obvious and well-studied examples. Of course, mobilization around an issue is not necessarily limited to political activism. Indeed, the barriers to participation in such movements (see, e.g., [de Moor et al. 2021](#)) would make such a focus partial at best. Notable in the case of climate activism, however, is that activist movements do (re)produce the terms of debate as found in many other arenas—emergency, depoliticization of science, and individual responsibility ([de Moor et al. 2021](#)).

The mass climate justice movement has undoubtedly been a success in social movement terms—it has been able to organize simultaneous demonstrations across several continents, and hold successful global days of protest with at least 1.5 million participants ([Almeida 2019](#)). XR and FFF have promoted hundreds of actions, and [Almeida \(2019\)](#) describes it as “one of the most extensive social movements on the planet” (see also [de Moor et al. 2021](#); [Laux 2021](#)).

Despite growing awareness, however, the success of the climate movement has not resulted in a significant change in the responses of industrialized nations to worsening anthropogenic climate change ([Wright et al. 2018](#)), and most people are not engaged in climate activism. This limited public response—in terms of social movement activity, behavioral changes, or public pressure on governments—exists worldwide ([Norgaard 2018](#)). Furthermore, despite the success of attempts

to increase understanding of climate issues, that understanding has not led to widespread action or even support for the goals of the movements—as FFF protesters acknowledge, their demands are made in the face of the opposition of the majority of people (de Moor et al. 2021).

This recent climate activism focuses in large part on urging governments to “follow the science,” in the terms of FFF and XR (de Moor et al. 2021; Doherty et al. 2018). Social movements such as FFF tend to be framed as *global and scientific* (Della Porta 2019), with a “universalistic orientation” reliant on reason understood in terms of scientific insight (Laux 2021; Eisenstadt and Giesen 1995). Such a framing clearly has resonance amongst a relatively large group of people (Laux 2021). Indeed, the majority of research on climate change has presumed that lack of information or understanding is the limiting factor in political mobilization (Norgaard 2018); activism is assumed to be linked to growing scientific evidence and media attention (de Moor et al. 2021).

There is an established body of literature analyzing the factors that influence participation in activism, such as education, age, gender, conditions of relative deprivation, and the role of emotions (de Moor et al. 2021; Corry and Reiner 2021), but these tend to focus on the ability of people with shared goals or grievances to effectively establish a social movement (see, e.g., McCarthy and Zald 1980; Edwards and McCarthy 2004) rather than the factors that influence people’s understanding of themselves as having those shared goals or grievances in the first place. The assumption again is that greater knowledge of the urgency of the issues at stake will provide the common interest—on this reading, the nature of the (climate) threat as imminent and global should provide urgency and align common interests, understood as the basic building blocks of sustained collective action (Almeida 2019). A variant on this argument suggests that it is the deliberate frustration of the dissemination of accurate knowledge about climate change that explains the lack of political action. On this reading, the “defensive techniques that economic elites are adopting to divert, neutralize, undermine and/or repurpose the research and activism that can help us with the task of minimizing harm and changing course” is what limits mobilization (Wright et al. 2018; see also Klein 2014).

#### *Socializing Anthropocene Mobilization*

While it is tempting to explain lack of action in response to the Anthropocene in terms of lack of knowledge or understanding, a growing body of research indicates that this is not the case (Jasanoff 2011; Beck 2012); that the problem is rather a *socially* reproduced one of inaction despite knowledge (Bonneuil and Fressoz 2017; Hecht 2018; Rowson 2013), explained by factors such as denial (Norgaard 2011; Head 2016) or residual noncognitive attachments (Connolly 2017). For a related body of literature, it is not ignorance of the science that is the problem, but the depoliticizing effects of that scientific framing that preclude a radical social message—a focus on carbon counting, for example, rather than radical political change (see, e.g., Swyngedouw 2010). Swyngedouw (2010, 219) argues that the science/crisis framing of the climate issue “produces a thoroughly depoliticised imaginary, one that does not revolve around choosing one trajectory rather than another, one that is not articulated with specific political programs or socio-ecological projects or revolutions.” On this reading, the result of such depoliticization is a lack of progress in climate policy because “science has taken centre stage but is unable to offer political solutions” (Grundmann and Rodder 2019).

Certainly, then, the distortion of science and corporate attempts at obfuscation matter, but explanations about the lack of political mobilization being due to vested interests of global corporate capitalism or a lack of understanding of the issues are probably insufficient if the problem is one of denial or depoliticization rather than ignorance. Indeed, if the scientific framing itself is part of the problem, then this

indicates a need to look at the broader structures of meaning that (scientific) knowledge production around the Anthropocene (re)produces and their implications for social rationalities and subjectivity. Rather than a direct focus on climate activism or social movements, therefore, my approach turns to these structures that are, perhaps unwittingly, often reproduced by the social movements seeking to address the climate crisis. As such the framing of social movements around climate is treated as one element in a broader societal discursive framing of the Anthropocene.

As a number of authors have now argued (see, e.g., [Clark and Szerszynski 2021](#)), we need to understand the Anthropocene itself in social terms to show how particular social relations brought it into being. The Anthropocene, on this reading, is social in origin; it is a materialization of past social relations ([Malm 2016](#)). [Clark and Szerszynski \(2021, 49\)](#) argue that, “To socialize the Anthropocene, the Great Acceleration, the fossil fuelled Industrial Revolution, is to insist that the geohistorical trajectory that was followed expressed particular social interests, that it materialized the imaginaries and imperatives of specific social groups, that it was situated in select regions of the world at unrepeatably historical junctures.” Such a social reorientation does not need to stop at an analysis of Anthropocene origins; it indicates also a need to look to the social in thinking about political mobilization and to consider the ways in which the Anthropocene continues to be made socially and has social effects. While my focus is not directly on climate social movements then, the extensive broader social movement literature offers insights into processes of emergence of collective action which highlights the importance of this social element of mobilization—precisely that element that I will go on to argue is constrained by the security logics circulated by dominant Anthropocene knowledge-production practices.

Early social movement literature sought to understand political mobilization in terms of a rational response to grievances ([Cohen 1985](#); [Corry and Reiner 2021](#)). In many ways, it is this model that characterizes the framing of movements such as XR and FFF as rational (scientific) responses to what should be (if the knowledge were widely enough understood) a shared sense of grievance. However, this “rational response” model was in large part supplanted by identity-oriented approaches ([Cohen 1985](#); [Corry and Reiner 2021](#)). Social movements, this approach argues, are not about ideas of common interest, but instead are (re)productive of forms of collective identity ([Corry and Reiner 2021](#)), reliant on tight social networks as connecting sites of protest ([Koopmans 2004](#)). Similarly, shared awareness theories ([Shirky 2008](#)) focus on the need for a perception among individuals that they are members of a larger group in order to trigger collective action, and collective identity theories ([Melucci 1995](#)) show how action is made possible through creating a shared definition of the social world.

In short, external “facts” are insufficient to prompt action; political mobilization is, on all of these accounts, reliant on social relations and the worlds that emerge from them. As I will show below, despite its oft-touted critical potential, the dominant production of the Anthropocene in fact runs the risk of transforming these social relations into security relations. The more the “Anthropocene as crisis” framing is pushed in attempts to prompt action, the greater this risk becomes.

### **The Securitization of the Anthropocene**

While climate change is often linked with security threats in academic and popular debate, both directly and through invoking threats of climate migration, resource depletion, and so on, the Anthropocene as a concept does not follow the same pattern. UK mainstream print media coverage of the Anthropocene has increased significantly over the past 20 years—in the 16 years between 2001 and 2017, there were 265 articles mentioning the Anthropocene, while the 5-year period from 2017

to 2022 yielded 521 articles.<sup>2</sup> This coverage tends to focus on the scientific and technological debate—of those 521, 340 included discussion of terms such as science, earth system, geology, and technology.<sup>3</sup> In contrast, coverage linking the Anthropocene explicitly with ideas of security or threat was limited—only 93 articles. Over the same period, however, 158 articles linked it with broader ideas of crisis and emergency. The perspective is planetary and environmental but does not integrate with the political and economic elements found in coverage of climate change; rarely is the Anthropocene linked to the market, for example. The Anthropocene is overwhelmingly presented as a scientific, rather than a political, issue—it is about the planet, extinction, and long-term geological history; it is covered in the *New Scientist*, but rarely in *The Economist*.<sup>4</sup>

The lack of explicit security framing in media coverage of the Anthropocene resonates with a growing body of academic work in which the Anthropocene is positioned as a critical concept, one that upsets the easy separations and dichotomies often found in security claims (Clark 2011; Burke et al. 2016; Harrington 2016; Fagan 2017; Rothe 2020; Randazzo and Richter 2021). The Anthropocene crisis, on this reading, opens up a much broader crisis of sense (Yusoff 2013) and asks us variously to develop a planetary consciousness, to appreciate the more-than-human world and the intricacy of ecosystems, or to engage alternative and marginalized ontologies. It seems to open space for alternatives to a security rationality based around the separation of human and nature, the identification of threats, the production of enemies, and short-termist, centralized, hierarchical, or militarized decision-making. One answer to the question of why the Anthropocene has not engendered a crisis-level response, as above, might be precisely this lack of “traditional,” exceptionalist securitization, emergency framing, or clear enemy (Dalby 2020). However, nor do we see an explicit politicization of the Anthropocene or alternative responses to the crisis called for by more critical voices or activist movements.

These alternatives, however, are of course not the only options. While the Anthropocene is not invoked in explicitly exceptionalist security terms, this does not mean it is not securitized. Indeed, a number of authors have indicated the risk of an extension of security regimes that work biopolitically through the governance of life processes (Dillon and Lobo-Guerrero 2008) beyond the human to the environment in the context of the Anthropocene (e.g., Chandler, Cudworth, and Hobden 2018; Rothe 2020). However, this existing research is focused on responses to Anthropocene challenges rather than on the emergence, usage, and effects of the concept.

If we focus instead on the knowledge production practices by which the Anthropocene is produced in terms of crisis, we can see that it relies on and circulates a particular virtual security rationality (Dillon 2003). If the stable, predictable, and manageable Holocene offered the perfect conceptual stage for a security rationality understood in traditional terms of protection, stasis and managing the future through extending the present (or indeed could be viewed as a conceptual product of this security logic and its broader modernist enframing), then the Anthropocene earth produced as unstable, emergent, complex, and self-regulating moves the earth from stage to actor, renders the earth virtual, risky and contingent, and connects human and planetary processes such that these rationalities become all-encompassing.

In order to show how the production and deployment of the Anthropocene concept is securitized despite its concentration in scientific, academic, media, and activist contexts that do not link it explicitly with security terminology I draw on

<sup>2</sup> The following draws on the results of a search of UK newspaper articles (*The Times*, *The Guardian*, *The Telegraph*, *The Sunday Times*, *The Observer*, *The Financial Times*, *The Independent*) and periodicals (*The Economist*, *The New Scientist*) mentioning the Anthropocene between January 1, 2017 and January 1, 2022.

<sup>3</sup> Search results are for articles linking the Anthropocene with any of the following terms: science, earth system, geology, strata, technology, boundaries, graphs, fossil, and rock.

<sup>4</sup> In a notable exception, *The Economist* made the Anthropocene a cover story in 2011.

Jef Huysmans' (2014) concept of diffuse securitizing. Through this lens, we can see how the Anthropocene concept is enmeshed in a broader set of contextual relations which render it part of the security terrain. The practices of knowledge production around the Anthropocene, its use as a concept and seeming critical efficacy rely on security rationalities and in so doing mobilize a particular register of meaning that defines "our relations to nature, other people, the self" (Huysmans 1998, 228). It is through this mobilization that the Anthropocene manages the radical crisis of sense which on first readings it seems to open up.

Huysmans (2014) suggests the term "diffuse securitising" to describe low intensity, dispersed security practice and power relations as distinct from state-based exceptionalist securitizing. His focus is on "assembling suspicion" as enacted through surveillance and risk management, which results in a general atmosphere of security or fear (2014, 9). Other modes of dispersed political and social processes, however, can also circulate insecurities, and my argument here is that the Anthropocene does just this. Huysmans shows how securitizing operates through a socially pervasive atmosphere that he calls the "unbinding of security" (2014, 9), which creates insecurities and produces ways of doing politics (2014, 18). It is these ways of doing politics as produced by the knowledge practices surrounding the deployment of the Anthropocene that I suggest cause difficulties for political mobilization—they produce particular conceptions of "collective states, authoritative agencies, political struggle and political living together" (Huysmans 2014, 19), that is, a particular socio-political rationality, and in this case one that I will argue severely constrains possibilities for collective mobilization.

The diffusion of security operates not through linking security with other discrete fields (Huysmans 2014, 75) (as in a "sectors of security" approach [Buzan et al. 1998]) but by "letting security language and practice slide across issues" (Huysmans 2014, 83). Issues are connected "discursively, institutionally, [and] technologically," juxtaposed, and "netted" together horizontally, by association (Huysmans 2014, 84). In addition to Huysmans' focus on the discursive, institutional, and technological connection of issues, I suggest that in the case of the Anthropocene we might also usefully look at the common conceptual field across which issues become linked.

As we saw above, the Anthropocene is not straightforwardly securitized through a direct use of the signifier "security." Nor does its deployment always foreground insecurities in more broad terms. However, in the light of Huysmans' work on the unbinding of security, a series of discursive connections around ideas of risk, scalability, preemption, calculation, and emergence through which security rationalities slide across issues, and which are central to the knowledge practices that produce the Anthropocene as an object, become visible. The following section illustrates the circulation of these key ideas in knowledge production around the Anthropocene before deploying a virtual security lens to draw out their implications.

### **Knowledge Production in the Anthropocene**

#### *Graphs, Boundaries, and Strata*

There are, on a number of accounts, "two" Anthropocenes—one made visible through developments in ESS and one focused on the geological record. While some authors argue that these different understandings of the Anthropocene lead to quite different concepts and consequences (e.g., Hamilton 2015), here I will suggest that both rely on and reproduce discursive formations that net them with security logics. While the differences between ESS and geological Anthropocenes are important, it is also noteworthy that in dominant and popular representations of the Anthropocene analysis tends to slide between the two registers.

For ESS and work drawing on it, the Anthropocene comes into view primarily through the so-called "great acceleration" graphs and Rockström's "plane-



tary boundaries” model that they informed (Rockström and Klum 2015). The first iteration of the great acceleration graphs was published in 2004 and showed a collection of 24 earth system and socioeconomic trends from 1750 to 2000 (Steffen et al. 2004). Key socioeconomic measures are of world and urban population, real GDP, energy and water use, and numbers of motor vehicles. Earth system measures include atmospheric carbon dioxide, nitrous oxide, and methane concentration, surface temperature, stratospheric ozone loss, and ocean acidification. The graphs have since been refreshed and updated to 2010 (Steffen et al. 2015) and reproduced extensively in both media (Steffen et al. 2015 cite the following: [globaia.org](http://globaia.org), [wanderinggaia.com](http://wanderinggaia.com), [visualizing.org](http://visualizing.org), [anthropocene.info](http://anthropocene.info), <http://www.newscientist.com/article/dn14950-special-report-the-facts-about-overconsumption.html#.VCVmXef4Lew>) and academic (e.g., Paglia 2015; Castree 2019; Shoshitaishvili 2020) commentary on the Anthropocene, and the measures are central to the European Environment Agency’s environmental assessments (European Environment Agency 2020).

The graphs are most often arranged as two sets of thumbnail images—most show large and rapid increases since 1950, and many of those increases are exponential. This is contrasted with a dramatically slower rate of growth or, for some measures, no/very little data in the period before 1950. Some graphs, such as paper production, fertilizer consumption, stratospheric ozone loss, and surface temperature, level out or show a decrease as they approach the current period. The overall impression produced by the collection of graphs, however, is of a step change around 1950—the “great acceleration”—in a series of earth system markers, corresponding to an increase in world population and concomitant resource use. The great acceleration graphs are central in debates around starting dates for the Anthropocene (see Fagan 2019), which the Anthropocene Working Group has now proposed should be set at the 1950 date indicated by the graphs (<http://quaternary.stratigraphy.org/wp-content/uploads/2021/03/AWG-Newsletter-2020-Vol-10.pdf>)<sup>5</sup> because “the Great Acceleration aims to express the holistic, comprehensive, and interlinked nature of post-1950 changes covering socioeconomic factors and biophysical processes” (Zalasiewicz et al. 2021).

The great acceleration graphs also informed the development of the planetary boundaries framework, first published in 2009 as the findings of research at the Stockholm Resilience Centre led by Johan Rockström (Rockström et al. 2009). The framework identifies nine processes that influence the stability and resilience of the earth system: stratospheric ozone depletion, loss of biosphere integrity, chemical pollution, climate change, ocean acidification, freshwater consumption, land system change, nitrogen and phosphorus flows, and atmospheric aerosol loading (Rockström et al. 2009). Again, the measures are framed in terms of change since 1950. The framework details the limits for each measure that mark the upper boundary of a “safe operating space” for humanity—in short, the maintenance of broadly Holocene-like conditions within which continued economic development is possible (Rockström and Klum 2015). Beyond these boundaries, the earth system is likely to become unpredictable; system change is likely to be nonlinear due to the mechanisms of feedback loops that connect the processes.

There are two further zones, the “zone of uncertainty” and “beyond zone of uncertainty,” associated with “increasing risk” and “high risk,” respectively (Rockström et al. 2009). In 2015, an update to the boundaries framework showed that four of the nine boundaries—climate change, loss of biosphere integrity, land-system change, and altered biogeochemical cycles—had already been exceeded (Steffen et al. 2015). Climate change and biosphere integrity are what the authors call “core

<sup>5</sup> While the Anthropocene Working Group has agreed on this date to propose to the International Commission on Stratigraphy (ICS), the body responsible for ratifying any changes to the geological timeline, the decision on whether to adopt it will not be made by the ICS until 2024.

boundaries,” meaning that exceeding them shifts the earth system into a “new state.” This means that variation is no longer within Holocene limits and that the move to a new state—the Anthropocene—cannot be reversed.

The model was popularized by Rockström and Klum’s accessible popular science book *Big World Small Planet* (2015), media accounts, and academic debate (Burke et al. 2016; Hamilton 2018; Dalby 2020) and is the subject of a Netflix documentary, *Breaking Boundaries: The Science of Our Planet*, narrated by David Attenborough, previewed at the Biden Climate Summit in 2021, and accompanied by a book forwarded by Greta Thunberg. The framework informed the UN High Level Panel for the Rio + 20 summit’s publication, *Resilient People, Resilient Planet*, and is a touchstone for resilience approaches to planetary change more generally. It is the dominant paradigm used in international climate science programs (Harrington 2020) and has been cited by the Global Environment Outlook of the United Nations Environment Programme and the Global Assessment Report on Biodiversity and Ecosystem Services (Biermann and Kim 2020). The model has also begun to have some impact on policy, though mainly in the Global North (Biermann and Kim 2020). The planetary boundaries framework is also the dominant way in which the Anthropocene is engaged in International Relations and security (Hamilton 2018, 46)

Running parallel to the ESS production of the Anthropocene is a more geological approach, which seeks to define the epoch as a time unit in stratigraphic terms. Indeed, it is ultimately the analysis of rock layers that will provide grounds for the official adoption of a new epoch by the ICS, the body responsible for defining the geological timescale and “setting global standards for the fundamental scale for expressing the history of the Earth” (<https://stratigraphy.org>). The geological timeline arranges deep history into discrete and precisely defined globally synchronous units; the current period is the Meghalayan age, of the Holocene epoch, within the Quaternary period, within the Cenozoic era, within the Phanerozoic eon. The geological marker for this age is found 4,250 years before the year 2000—a stalagmite in Mawmluh Cave in Northeast India (<http://quaternary.stratigraphy.org/major-divisions/>). Most divisions in the timescale have such a marker, known as a GSSP, a “global boundary stratotype section and point,” or “golden spike.” Usually a GSSP will mark the first appearance of a fossil species and it must have global correlation (<https://stratigraphy.org/gssps/>), that is, it needs to be a single point that is indicative of a geological change that can be found worldwide in rock strata of the same age.

The geological marker for the Anthropocene is made by the radionuclides created and spread worldwide by the nuclear bomb tests in the early 1950s (<http://quaternary.stratigraphy.org/working-groups/Anthropocene/>), although the location of the golden spike that will be chosen to mark the advent of these novel elements entering the rock strata has not yet been decided. So, while the ESS approach offers a range of markers indicative of the start of the Anthropocene around 1950, not all of these fit the requirements to define a new epoch from a geological perspective. Climate change, biodiversity loss, and so on, in and of themselves, do not create the necessary geological footprint. Key to the geological determination of the Anthropocene is to demonstrate not only that the stable Holocene period has ended but that the change in epochs is marked in the rock layer in a manner that is both global and synchronous.

Of course, both the ESS and the geological productions of the Anthropocene are more complex and contested than this brief overview suggests. However, the conceptual framework through which the Anthropocene is produced as observable—concepts such as boundaries, limit conditions, global scales, calculability, feedback loops, and so on—is rarely the subject of that contestation. It is that framework to which the article now turns.

*Scale, Measurement and Coevolution*

The key element of these practices of knowledge production around the Anthropocene that is particularly important for the argument being made here is that they involve practices of scalar production and calculation which both *produce* the Anthropocene in terms of risk, contingency, and emergence and simultaneously *manage* that emergence.

The Anthropocene is often argued to be difficult to engage with or mobilize response to due to the way it brings together a number of different scales (Gardiner 2006; Hamilton 2017; Shoshitaishvili 2020). For example, the difficulties of thinking about politics in the context of deep or geological time, the problems with communicating the nonlinear nature of climate change past certain tipping points, or the barriers to understanding the interaction of earth-system processes with phenomena such as endocrine disruptions (see, e.g., Thomas 2014). Indeed, it is the scaling effects of claims about the Anthropocene around which much critical commentary coalesces, whether as an opening or opportunity to denaturalize established categories such as different human and natural timescales (Chakrabarty 2012; Connolly 2017; Rife 2020; Randazzo and Richter 2021) or as problematically universalizing, as in claims about species-level cause and effects (see, e.g., Crist 2013; Yusoff 2013; Haraway 2016; Bonneuil and Fressoz 2017). However, despite the destabilizing potential of these scalar disjunctures, the Anthropocene is most often brought into view precisely through vehicles that reinstate scalar security.

The planetary boundaries framework is an astounding feat of measurement, not least because it seeks to quantify the myriad global interconnections between human society and planetary processes. As Rockström and Klum (2015, 155) argue, “we must measure every aspect of how nature interacts with societies” in order to track changes in the earth system. The great acceleration graphs suggest that such all-encompassing measurement—of things as diverse as foreign direct investment and shrimp aquaculture—is possible. They produce a world in which the social and natural are measured, and measurable, in the same way. The geological approach offers the backdrop to such practices by establishing a series of nested scales through which deep history, and our place in it, can be categorized. In so doing, it secures a particular temporal scale. A similar function is performed by its unification of the human and nonhuman into a single, universal timeline (Fagan 2019). Indeed, the Anthropocene can only be apprehended through global models (Edwards 2010; Hecht 2018; Harrington 2020), and it is arguably only through the ESS developments which allow the Earth to be understood as an “integrated assemblage” that the Anthropocene concept can emerge (Harrington 2020, 58).

The complexity of sociopolitical life on/of the planet is thereby condensed and abstracted into global, aggregate, and calculable trends. This reduces life to mappable data, which, through the central concept of a “safe operating space for humanity,” is given meaning primarily in terms of species survival. So far, so biopolitical: the Anthropocene is produced in such a way that it defines what is needed for survival (the safe operating space is one in which a “modern” way of life and continued economic growth are possible) (Rockström and Klum 2015) and thereby what constitutes life (economic viability). Life is made calculable and measurable. The world produced is a “simple, knowable and predictable machine with interlocking constituent parts” (Harrington 2020, 61), visible and therefore manageable as a whole (Brand et al. 2021).

However, the Anthropocene made manifest through ESS goes further than this. It is not only that the social and natural can be calculated in similar ways, but that they also coevolve in a symbiotic relationship. The great acceleration graphs are plotted on similar axes, rendering the myriad human and natural processes on compatible scales. The lines plotted also give the overall impression of developing in the same way. When examined more closely, we can see that in fact some of the different

measures produce rather different graphs but when presented together, in miniature, as they almost always are, the overall picture is of a series of exponential curves with an upturn in gradient somewhere around 1950. The diverse elements that make up the human-natural world evolve together; life becomes a function of co-evolution.

To present the human and natural as coevolving and representable on congruent scales is not neutral; as [Veland and Lynch \(2017, 3\)](#) argue, “exercising scale is exercising power” (see also [Hecht 2018](#)). Scientific concepts and metaphors have framing effects ([Crist 2013](#); [Uhrqvist and Lövbrand 2014](#)) and rely on social judgments ([Hamilton 2018](#); [Castree 2019](#)); neither the production of scientific models nor their implications for IR and security are neutral ([Hamilton 2018](#)). The roots of systems thinking about the earth lie in the Cold War attempts to predict and control the atmosphere ([Edwards 2010](#); [Heymann and Dahan Dalmedico 2019](#)), and it is this planetary measurement that sets the stage for technocratic solutions such as geoengineering ([Harrington 2020](#); [Brand et al. 2021](#)). Those models are also situated and partial; it is unlikely, for example, that Indigenous communities would choose the same measures for the great acceleration graphs, unlikely that their dates or scales would minimize the enormous pre-1950 population fluctuations caused by colonialism (see, e.g., [Lewis and Maslin 2015](#)).

On a number of accounts, the measurement techniques that enable ESS result in extending biopolitical governance from the human to the environment ([Grove 2010](#); [Wolfe 2012](#); [Rothe 2020](#)). The specific way in which the idea of the planet is produced through these measures is problematic—as for example in [Clark’s \(2011\)](#) argument that a focus on anthropogenic planetary volatility obscures “natural” planetary dynamism, [Paglia’s \(2015\)](#) argument that the graphs are largely a story of human influence, [Hamilton’s \(2018\)](#) discussion of the human mastery implied in the idea of stewardship, and [Brand et al.’s \(2021\)](#) argument that the identification of thresholds is led by a narrow worldview that ignores Indigenous ideas of biodiversity loss and what it means.

Similarly, a growing body of literature suggests that the scientific framing of the Anthropocene renders it post-political in that it obscures the social and political structures behind the graphs ([Swyngedouw 2010](#)). There is, argue [Clark and Szerszynski \(2021, 37\)](#), a failure to socialize the geological; “the exponential curves used in support of the Great Acceleration argument tell us about symptoms and effects rather than the underlying dynamics.” That is, the social structures that *cause* boundaries to be transgressed are marginalized.

While these broader critiques indicate the problems in producing the Anthropocene through full-spectrum planetary measurement, they offer less detail on the way in which the ESS production of the Anthropocene also produces and manages instability, multiplicity, contingency, and emergence. As will be elaborated below, life produced as developmental and evolutionary is also life produced in terms of potential and potential dangerousness. Both ESS and geologically informed versions of the Anthropocene are future-oriented discourses. The geological search is for a marker that will last millions of years into the future to demonstrate the impact that humans will have had on the planet; it is the traces left for imaginary future generations that determines a boundary on the geological timeline. The ESS approach relies on a series of graphs whose exponential curves draw the eye toward the future. But importantly, these are futures imagined not in terms of of stable progression but instead of boundaries and limit events that produce the future in terms of unpredictable emergence. Indeed, for a number of authors, it is precisely the move to planetary instability that distinguishes the Anthropocene from the Holocene; [Clark and Szerszynski \(2021, 8\)](#) argue that what is distinctive about the Anthropocene is an understanding of the planet as having the capacity to “become other to itself, to self-differentiate” (see also [Hamilton 2017](#)).

In this vein, perhaps more important than the full-spectrum calculation through which the Anthropocene becomes visible is the way in which it also articulates the limits of those calculations. The great acceleration graphs are translated into planetary boundaries, which once passed take us into realms of “high risk.” The authors of the model are very clear that the boundaries are not fixed but themselves likely to coevolve—that a change in one area, and in particular the transgressing of any one boundary, is likely to lead to feedback mechanisms that will affect the other earth processes in unpredictable ways (Rockström et al. 2009). The planet understood as a (human-natural) system is an emergent one of tipping points, feedback loops, and nonlinearity. Understanding the planet itself as an emergent complex system, developmental, and coevolving with human life circulates not only a security logic concerned with managing uncertainty through knowledge and calculation but one that operates through the *production* of emergent, developmental life—a specifically virtual security rationality.

### The Anthropocene as Security Practice

#### *The Circulation of Virtual Security and the Management of Emergence*

Virtual security offers a framework to understand how security operates *through* the production of uncertainty, in distinction to some other security logics that seek to control or eliminate uncertainty. The key insight in identifying a virtual security logic is the focus on emergence, and the Anthropocene is produced as novel precisely on this terrain of emergence, self-differentiation, and coevolution, as described above. It is a security logic in these virtual terms that can be seen permeating the scientific, media, and popular cultural terrain on which the Anthropocene concept is produced.

What Dillon (2003, 551) calls “virtual security” focuses on bodies in formation and in so doing shifts the focus of security from the (extension of the) present to the future understood as emergent. Virtual security takes as its focus “the dynamic interplay of (dis)order and its commanding power of contingent assemblage and non-linear emergence” (Dillon 2003, 544). Dillon’s (2003, 2007, 2008) concern is with the production of life as the subject of security, and since security can only secure what is known, that life must be reduced to calculable and mappable data; “Life that remains not knowable, unknown or intractable to knowing for whatever reason . . . is the ultimate danger” (2003, 533). He argues that these processes of reducing life have intensified with advances in the life sciences, which reframe life as a function, seen as coevolving with its environment and with other life forms (Dillon 2003, 533). This is life understood as emergent in complex systems, developmental and evolutionary (2007). In turn, life as emergent always has the potential to become dangerous, and so security becomes concerned primarily with commanding the process of becoming of developmental, evolutionary life (Dillon 2003, 537). Since any politics of security must first produce what it claims to secure, emergent life must be produced in ways that are amenable to knowledge and management; it becomes understood in molecularized, digitized, and calculable terms, as a response to the threatening complexity of coevolution.

Virtual security’s concern with both producing and securing bodies (as) in formation maps clearly onto the dominant productions of the Anthropocene detailed above. The ESS/planetary boundaries approach not only produces the planet as emergent but is simultaneously an exercise in mapping, calculating, and managing emergence in order to render that contingency in manageable terms. However, while the boundaries are focused on “natural” planetary processes, those processes are netted with human and social life both generally through discourses of the Anthropocene as the age of the human, and specifically by the way that the Anthropocene is made visible through linking the human and natural. In turn, human life

is rendered similarly both dangerous and calculable—its emergent potential coded as a number in a growing global population, an owner of a motor vehicle, a carbon footprint, a consumer, an energy user, a recycler.

This attempt at the management of excess and contingency can be seen in particular in policy responses that draw on societal resilience as a response to Anthropocene challenges (see, e.g., [Chandler 2020](#); [Chandler and Pugh 2021](#)). Resilience approaches acknowledge the excess of life and becoming brought into view through the Anthropocene and seek to harness and work with emergent potential rather than to manage or limit it in more traditional ways ([Chandler and Pugh 2021](#)). In biopolitical terms, resilience seeks to manage not (just) life itself, but the possibilities for emergent life. As [Chandler \(2020\)](#) argues, “In discourses of societal resilience, the problems, shocks and instabilities being responded to are always constructed as “inevitable,” in a complex or “non-linear” world.” That is, attempts to manage emergence focus not on causes but effects, thereby obscuring the structural conditions leading to that instability which is to be managed. The replacement of a sociological with a security imagination ([Huysmans 1998](#), 232) then clearly has important policy impacts. However, in the final section of the article, I explore the implications of the Anthropocene circulation of a virtual security rationality for the creation and transformation of social relations and identities—what does the management of emergence do to possibilities for political mobilization?

*The Anthropocene Subject: Calculation, Relation, and Context*

As is by now well established, the signifier “security” (whether explicit or diffuse) is performative rather than descriptive—as [Huysmans \(1998, 232\)](#) argues, “it organises social relations into security relations.” Security entails a particular process of ordering ([Huysmans 1998, 232](#)), which “postpone[s] the limits of reflexivity as far as possible by accumulating truth about how the world works” ([Huysmans 1998, 245](#)). With the Anthropocene, we see this ordering strategy of security taking place, but without explicit reference to security. Indeed, the framing of the debate on political mobilization in terms of “the science” discussed above performs precisely this function. It is in shifting the terms of debate to “the science”—to what extent various events are due to climate change, the accuracy of the models, and so on—that depoliticization occurs. This plays, as [Latour \(2017\)](#) has pointed out, directly into the hands of climate skeptics, by prioritizing a logic of reducing uncertainty and postponing political discussion.

This process of ordering involves the production of data about how the world (understood in both social and planetary terms) works. As we saw above, the Anthropocene is a product of measurement, scaling, calculation, and the management of contingency through risk. This measurement is produced at a global level, and accumulates data far removed from context. The homogenization of the various human and nonhuman scales required to produce planetary-level data performs what [Huysmans \(2014, 98\)](#) calls the “thinning” of information into data. In his focus on surveillance and suspicion, he argues that the gathering of usable data “abstracts people and their practices from the immediate context. . . The data retain little, if any, traces of the embodied situation from which they are extracted” ([Huysmans 2014, 97](#)). This is the same “thinning” that [Dillon \(2003\)](#) argues happens when life is reduced to biological code. What is missed is the incalculable, the possibilities for emergence and transformation, without which meaningful *relation* (human and nonhuman) becomes reduced to calculable and coded *interaction*.

The social relations of the Anthropocene are thus obscured both in terms of cause and effect. “Thinning” replaces causes with patterns and correlations, marginalizing the role of structural social relations such as colonialism and capitalism in explaining the Anthropocene. The timescales and politics opened up by the Anthropocene’s conjoining of the geological and the social are managed by dis-

aggregating “thick” explanations into data points. Such a framing has implications for the emergence of subjectivity, identities, collectives, and appreciation of shared harms that are, as discussed above, key to understanding (a lack of) mobilization.

Turning firstly to the production of subjectivities, on a number of accounts, the ESS production of the Anthropocene is problematic in that it produces the subject as simplified, rational economic man, who is master of the planet (e.g., [Hamilton 2018](#)). However, in the thinning of information into data points, I think we can also see this mastery undone. Of course, there are excellent arguments for rejecting the modern subject understood in terms of mastery, and the Anthropocene understood in terms of complex interrelation and coevolution offers a tempting route out of the confines of that modern subject. However, to occasion this escape by means of a dispersal or erasure of the subject through its thinning and decontextualization has its own problems, and in particular, I suggest, is a barrier to collective political mobilization.

In the context of the Anthropocene, what is obscured in the adoption of planetary-level ESS and geological logics around data in social and political thought is not only the problems associated with an idea of universal humanity in the mold of the modern subject but also the very idea of a subject able to engage in the world. The co-option of emergence by virtual security produces what [Dillon \(2003\)](#) calls the “postvital” subject. Rather than rational self-interest, will, and consciousness, such a subject is one of “inscription and code” ([Dillon 2003](#), 542). The virtual logic of securitizing through which the Anthropocene emerges relies not on claims about or production of identity but on the thinning out of any basis for identity claims into data points on a homogenized scale. Its focus on contingency and risk “does not differentiate inside from outside in a discursively organized play of friend/enemy or self/other. It therefore does not immediately inscribe a social or political identity—populations and risk pools do not constitute a people in the usual political and cultural uses of that expression” ([Dillon 2008](#), 322). Abstraction from context is depoliticizing; particular identities and meanings that might provide motivational impetus and grounds for social or political connection are obscured.

However, it is not so much that such practices are individualizing ([Huysmans 2014](#)), but that in a sleight of hand they also produce and govern the connectivity or relationality which might otherwise offer resources for political mobilization. As [Lundborg \(2016\)](#) puts it, the move to the virtual affects the capacity of the subject of security to resist because it takes away openness to possibility. What is produced is neither the subject as self-contained individual nor the subject as emergent in and of relation but instead a series of independently circulating disaggregated data points. The disaggregation of life into the “post-vital” ([Dillon 2003](#)) undoes any concept of the “thick” subject navigating and reproduced on multiple contextual scales—in [Donna Haraway’s \(2016\)](#) terms, a subject who can “stay with the trouble”—replacing it instead with elements that are recombinable but only through decontextualization.

In the context of the Anthropocene, this is particularly important because these are also the grounds on which calls for human-nonhuman connection are increasingly made. As [Dillon \(2008](#), 311) points out, seeking connection with the nonhuman through tropes of circulation, connectivity and complexity merely brings the nonhuman within the biopolitical understanding of life and so within the remit of biopolitical security technologies. In producing both the planet and the human as scalable, calculable, and disaggregated the principle of relation becomes calculation. The possibility of “thick,” (trans)formative relationships with both the human and the nonhuman is minimized—as [Tsing](#) argues, the work involved in making things scalable “covers up and attempts to block the transformative diversity of social relations” (2012, 523). As highlighted by critical Indigenous thought, this obscures those elements of interaction and relation that are not measurable (see for e.g.,

Povinelli 2016; Cajete 2018; Lien 2021) and that may be precisely the meaningful elements of relation out of which political mobilization can emerge.

An appreciation of the loss of context or situatedness has ramifications for thinking about political mobilization. Bonneuil and Fressoz (2017, 36), amongst others, argue convincingly that such mobilization requires a multi-scalar approach “from the molecular level of environmental effects on our heredity through to the global level of flows of matter and capital organized by the WTO, by way of local scenes at industrial sites or socio-environmental mobilizations.” Subjects need to be able to engage particular ecological and relational entanglements as well as broader global trends in order to traverse these different scales. This would require an understanding of the subject as emerging out of specific, noncalculable, contextual relationships, but in a way that is troubled by the strange, unlikely, or surprising interaction between this situated scale and that of broader global interactions.

In seeking to offer an alternative to the dispersed and disaggregated subject in this way, the result is not the rational subject, individual actor, or securely defined human that for a number of authors is what is missing in attempts to mobilize around the Anthropocene (see, e.g., Smith 2011; Hamilton 2017). I do not intend to argue for a return to the problematic modern subject. The Anthropocene does indeed trouble the boundaries of that subject but more than one possibility emerges from this troubling. The route most often taken, and the one of concern to those critics, is the troubling of the human/nature distinction to argue that subject and object become “blurred” or indistinct (e.g., Harrington 2020, 68). This fits with the logic of an ESS framework that presents the human/natural (and thereby subject/object and cause/effect) as coevolving. However, to argue that defined social relations and identities matter does not mean these must be derived from a prior conception of the subject. Rather, it shifts focus onto the processes of determination of the human/nature distinction. To think in terms of subjects, distinctions, collectives, planetary processes, and so on as *undetermined* rather than indistinct allows for an understanding of actors and collectives, specifically determined each time, emerging from transformative social (and nonsocial) relations.<sup>6</sup> Through the circulation of security logics, it is the potential of this emergence that is curtailed or obscured.

Foregrounding relation and noncalculability means that we can instead envisage subjects emerging out of, and engaging in, social and political relationships that are both mutable and that each time anew have the thickness to engage the contradictions of the multiple scales opened up in specific contexts for specific collectives. This is a subject understood as emerging out of Tsing’s transformative diversity of social relations, relations that occur at both the local and global level and that exceed attempts at calculation. Such an account would enable political mobilization of an open kind with multiple collectives, strategic alliances, and aims informed by the specific interplay of relationships at different scales in each context (see, e.g., Connolly 2017).

To return to the opening discussion of a lack of political mobilization as a socially reproduced problem, we can see that the dominant production of the Anthropocene is in danger of contributing to this reproduction by replacing transformative social relations with security relations framed in terms of circulation, connectivity, and complexity. Political mobilization, however, requires “thick” contextualized subjects and communities. The specificity of collectives and communities and the shared experience of harm such specificity might engender is, as discussed above, central to mobilization; as Bennett (2010, 19) puts it, “a new basis for political communities can be found in human–nonhuman collectives that

<sup>6</sup>While a full discussion of the implications of relational, intra-active becoming are beyond the scope of this paper, the argument is derived from quantum social theories such as Karen Barad’s (2007) for whom there are no entities prior to relation.



are provoked into existence by a shared experience of harm.” Similarly, [Norgaard \(2018, 174\)](#) has shown that, “local efforts to make climate change visible in one’s community such as developing climate ordinances, creating statewide carbon plans and other efforts to reduce emissions . . . strengthens existing community ties, identity and sense of place.” These contextual ties are an important prospect for “breaking through” climate denial ([Norgaard 2018, 174](#)). Rather than more convincing science, mobilization might be better served by the cultivation of practices of community, care, and attachment (see, e.g., [Connolly 2011](#); [Harrington 2016](#); [Harrington and Shearing 2017](#)), which are under threat from the securitizing and decontextualizing production of the Anthropocene.

### Conclusion

I have sought to show how the Anthropocene produces a paradox when thinking about political mobilization. The knowledge production practices that render it visible and actionable also circulate a security rationality that limits possibilities for mobilization. That production is done through methods associated with both geological and ESS versions of the Anthropocene. A lens that connects political mobilization with knowledge, understanding, and evidence contributes to this problem. If we start instead from an understanding of possibilities for mobilization as emerging from social relations, then we can see the problematic effects of this security rationality on prospects for mobilization.

To be clear: the argument here does not contend that the Anthropocene is not deeply concerning—climate change, environmental degradation, and human induced geological changes to the planet are most definitely important, harmful, a cause for extreme concern, and require action. However, I wish to sound a note of caution regarding the dominant production of the Anthropocene through planetary boundaries, ESS modeling of earth systems, and geological strata and to bear in mind the potential effects of their transformation of social relations into security relations.

The Anthropocene confronts us with “strange” beings, strange scales, and strange relationships ([Clark 2017, 146](#))—the great acceleration graphs, the calculation of planetary boundaries, the mapped interconnections of ESS, planetary imagination, geological timescales, and coevolution. These all make visible but simultaneously make manageable and calculable the not-yet of life in excess of being; the planet and its inhabitants as vital and emergent. A virtual security lens is therefore useful to illuminate the way in which Anthropocene knowledge production practices circulate a security rationality that both produces life as developmental and evolutionary and also then secures those processes of emergence, coding human life in such a way as to limit possibilities for transformative social relations so important for political mobilization. In the place of social relations, knowledge production practices around the Anthropocene produce instead security relations.

In making the Anthropocene visible and actionable, it becomes enmeshed in security logics that limit the possibilities for effective collective action. These logics disaggregate the subject into data points, which thin out not only bases for identity claims but also for transformative and emergent relation. Neither the modern subject nor the disaggregated subject can encounter contradictions of scale; the modern subject can only navigate multiple scales due to its own abstraction from and position as creator of those scales, and the subject treated and governed as disaggregated can only be recombined within a unified and universalizing scale. The disaggregated subject is so dispersed and thinned out that it cannot engage in an “entangled mesh of ongoing relations” ([Rife 2020, 80](#)), which themselves may prove productive and transformative. In seeking to direct emergence, the emergence of relation is also constrained, and it is relation that opens the subject to multiple

overlapping scales and the impetus to engage them. Constraining relational emergence limits the possibilities for reconfiguring communities of action.

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