Journal of Human Rights and the Environment, Vol. 15 No. 1, March 2024, pp. 4–22

Constitutionalizing in the Anthropocene

Floor Fleurke*
Associate Professor of EU Law, Tilburg Law School, the Netherlands

Michael Leach**
Assistant Professor, Tilburg Law School, the Netherlands

Hans Lindahl***
Professor of Legal Philosophy, Tilburg Law School, the Netherlands; and Professor of Global Law, Queen Mary University of London, UK

Phillip Paiement****
Professor of Law & Governance in the Anthropocene, Tilburg Law School, the Netherlands

Marie Petersmann*****
Assistant Professorial Research Fellow, LSE Law School, UK

Han Somsen******
Professor of EU Law, Tilburg Law School, the Netherlands, the Netherlands

The Anthropocene thesis, in its rejection of both the modernist separation between 'humans' and 'nonhumans' as well as in its treatment of 'humans' as a singular global geophysical force, presents fundamental challenges to constitutional theory and practice. First, in terms of conceptual and foundational transformations, the Anthropocene provokes the reconceptualization of legal relations as never being limited to human concerns, but as always and already part of more-than-human collectives. These legal relations are organized by the coagency of humans and nonhumans, in recognition of shared vulnerabilities and in relations premised on care. This reconceptualization demands a new understanding of representational practices that could constitutionalize more-than-human relations as political and legal collectives. Second, emergent technologies such as genetic and climate engineering introduce fundamental questions about regulatory modalities available in the Anthropocene, and the role that law plays in this regard. Such technologies have given rise to the

* Email: F.M.Fleurke@uvt.nl.
** Email: M.C.Leach@uvt.nl.
*** Email: H.K.Lindahl@uvt.nl.
**** Email: P.M.Paiement@uvt.nl.
***** Email: m.petersmann@lse.ac.uk (corresponding author). The authors would like to thank the colleagues and friends of the 'Constitutionalizing in the Anthropocene' research project funded through the Law School Sector Plan scheme of the Dutch Ministry of Education, Culture and Science. They also thank the participants to the CitA workshop that was held at Tilburg Law School in December 2020 and the anonymous reviewers for their constructive feedback on the article, as well as the editors of the journal for their engagement with the argument. For more information on the CitA project, please visit <https://constitutionalizing-anthropocene.org>.
****** Email: Han.Somsen@uvt.nl.

Journal compilation © 2024 Edward Elgar Publishing Ltd
The Lypiatts, 15 Lansdown Road, Cheltenham, Glos GL50 2JA, UK
and The William Pratt House, 9 Dewey Court, Northampton MA 01060-3815, USA

possibility of 'ruling by design', by technologically mediating 'natural' forces or Earth system processes to achieve pre-established regulatory goals. This possibility raises critical concerns about the remaining role for law in legitimising and enabling such developments. Finally, the temporal dimensions of the Anthropocene thesis cast a critical light on law's potential for driving radical transformations in (un)governance. In imagining future legal architectures capable of manifesting more-than-human constitutionalism, it is necessary to excavate the historical role that foundational legal principles and institutions – such as sovereignty and personhood – have had in facilitating exploitative relations between and beyond humans.

Keywords: *constitutionalism, Anthropocene, more-than-human collectives, emergent technologies, transformations*

1 INTRODUCTION

The 'Anthropocene' is the name proposed by Earth system scientists and geologists for the 'current epoch in which humans and our societies have become a global geophysical force'.[1] Understood as a geological phenomenon, the Anthropocene signals that 'humans' – viewed as a unified whole or as a species – wield a 'force' capable of marking and disrupting the 'natural' functioning of the Earth: anthropogenic disruptions are of such degree that they alter atmospheric, geologic, hydrologic, biospheric and other Earth processes. While the preceding Holocene epoch was characterized by relative stability in ecological conditions, the Anthropocene is marked by change, uncertainty and instability in the behaviour of the Earth, which carries wide-ranging implications for how domestic and international law conceives of and regulates socio-ecological issues.[2] Taken together with its companion concept of 'planetary boundaries' – a framework developed by Earth system scientists to propose 'boundaries' to nine processes that regulate the stability and resilience of the Earth to secure 'a safe operating space for humanity'[3] – the Anthropocene thesis has mainly been received in international law as a geophysical phenomenon presenting a major set of problems, the resolution of which requires rapid regulatory adaptations of legal norms and practices. A telling example is provided by the call to 'bolster legal boundaries to stay within planetary boundaries'.[4] Some have moved beyond calls for

1. W Steffen, PJ Crutzen and JR McNeill, 'The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?' (2007) 36:8 Ambio: A Journal of the Human Environment 614, at 614. The formalization of the 'Anthropocene' by the Anthropocene Working Group (AWG) of the Subcommission of Quaternary Stratigraphy, formed within the International Commission on Stratigraphy (ICS), still needs to be approved by the ICS. See the AWG's website, at <http://quaternary.stratigraphy.org/working-groups/anthropocene>.
2. D Vidas, J Zalasiewicz and M Williams, 'What Is the Anthropocene – and Why Is It Relevant for International Law?' (2015) 25:1 Yearbook of International Environmental Law 3; D Vidas et al., 'International Law for the Anthropocene? Shifting Perspectives in Regulation of the Oceans, Environment and Genetic Resources' (2015) 9:1 Anthropocene 13.
3. J Rockström et al., 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity' (2009) 14:2 Ecology & Society 32.
4. G Chapron et al., 'Bolster Legal Boundaries to Stay Within Planetary Boundaries' (2017) 1 Nature Ecology & Evolution 1. See also D French and LJ Kotzé (eds), *Research Handbook on Law, Governance and Planetary Boundaries* (Edward Elgar 2021); and infra (n 51).

reforming or strengthening international law, prescribing instead a whole new legal paradigm, namely an 'Earth System Law for the Anthropocene'.[5]

The Anthropocene, however, implies much more than a reconfiguration of the 'environment' as a complex, unstable and dynamic Earth system to which legal thought and practice must adapt. It signals a reconfiguration of the 'human' category itself, and of the relationship between 'humans' and 'nonhumans' hitherto assumed by Western modern (legal) traditions, and long refused and resisted by Indigenous and decolonial traditions.[6]

The confrontation of the humanities and social sciences with the Anthropocene thesis constitutes indeed a major disruptive 'event'.[7] At the heart of the debates lies a contestation surrounding the term 'Anthropocene' itself, which is imbued with problematic assumptions regarding the transcendental ideal of 'humanity' posited as both culprit and victim. Critiques of a conflated 'humanity' have been advanced from various and intersectional perspectives,[8] and alternative names for this epoch have been proposed to circumvent the conceptual flaws that the orthodox term and definition entail.[9] These reconfigurations advocate a rejection of the modernist separation between 'humans' and 'nonhumans' and of the mastery of the former over the latter that has been taken for granted in Western societies since the Enlightenment period. Critics also reject an unqualified 'human' category as a singular 'global geophysical force', and denounce the role played by specific societies and their enactment of a capitalist world-ecology.

Building on these critiques, the research project on 'Constitutionalizing in the Anthropocene' (CitA) takes stock of these radical reconfigurations of human-nonhuman relations to explore the constitutional dimensions that living in the Anthropocene implies for more-than-human collectives with distinct, distributed and differential agencies, response-abilities and vulnerabilities.[10] From this perspective, the societies or worlds that 'humans' form and the worldviews they enact are not perceived as being built

5. See, eg, LJ Kotzé and R Kim, 'Exploring the Analytical, Normative and Transformative Dimensions of Earth System Law' (2021) Environmental Policy and Law 1. See also T Cadman, M Hurlbert and AC Simonelli (eds), *Earth System Law: Standing on the Precipice of the Anthropocene* (Routledge 2022).

6. See, eg, J Singh, *Unthinking Mastery: Dehumanism and Decolonial Entanglements* (Duke University Press 2018); L Betasamosake Simpson, *As We Have Always Done: Indigenous Freedom through Radical Resistance* (University of Minnesota Press 2020); C Black, *The Land is the Source of the Law: A Dialogic Encounter with Indigenous Jurisprudence* (Routledge 2010).

7. C Bonneuil and J-B Fressoz, *L'Événement Anthropocène: La Terre, l'histoire et nous* (Éditions du Seuil 2016); S Dalby, 'The Anthropocene Thesis' in M Juergensmeyer et al. (eds), *The Oxford Handbook of Global Studies* (Oxford University Press 2018) 173.

8. See, eg, K Yusoff, *A Billion Black Anthropocenes or None* (University of Minnesota Press 2019); R Braidotti, *Posthuman Knowledge* (Polity 2019); R Grusin (ed), *Anthropocene Feminism* (University of Minnesota Press 2017); JW Moore (ed), *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism* (PM Press 2016); H Davis and Z Todd, 'On the Importance of a Date, or, Decolonizing the Anthropocene' (2017) 16:4 An International Journal for Critical Geographies 761.

9. D Haraway, 'Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin' (2015) 6 Environmental Humanities 159; and Bonneuil and Fressoz, supra (n 7) at 119–317. For the orthodox definition, see supra (n 1).

10. 'Response-abilities' is used to refer to Haraway's call to cultivate an (in)ability to respond or a 'response-ability' as a practice of ongoing collective knowing and doing, where the duty to respond to harms is inherently joined with the question of differentiated ability to do so. For more on 'response-(in)abilities', see section 2 below, and n 22 specifically.

upon or emerging from without 'nature', but from within: not in disconnection from nonhumans but embedded in entangled more-than-human worlds. In this respect, CitA aligns with strands of theory that suggest ways of legally (re)positioning humans in relation to nonhumans, such as 'Earth jurisprudence' or 'wild law',[11] and with what has come to be coined more broadly as 'law for the Anthropocene', which unpacks ontological and epistemological implications that the Anthropocene condition triggers for legal thought and practice.[12]

The CitA project is concerned with the capacity to constitutionalize living in the Anthropocene. As Neil Walker usefully remarks: 'if practical reasoning in general is about deciding how to act in a context of practical choice, the special kind of practical reason associated with constitutionalism is concerned with the deepest and most collectively implicated question of "how to decide how to decide" how to act [collectively]'.[13] Set against the backdrop of the Anthropocene, the fundamental question of 'how to decide how to decide how to act collectively' must account not only for human collective action but for that of implicated more-than-human collectives. This reconfiguration opens myriad new questions and lines of (legal) inquiry, as this article argues.

The article is organized along the lines of the three analytical categories of transformations that animate the CitA project, namely: (i) conceptual and foundational transformations; (ii) regulatory transformations; and (iii) institutional transformations, each of which are given further elaboration in this article. Far from providing any definitive answer or solution to the problems identified, this overview aims to introduce readers to the main challenges that arise with conceptualizing and understanding how and to what ends living conditions in the Anthropocene can be 'constitutionalized' in and by law.

2 CONCEPTS AND FOUNDATIONS

One of the central research inquiries of the CitA project is to investigate and reconceptualize relations between humans and nonhumans. In its inquiry and critique, the project affirms and extends the 'Capitalocene' thesis, which aims to dismantle the capitalist world-ecology defined by an onto-epistemology of masterful 'humans' who relate to the 'nonhuman' through subjugation, control and exploitation.[14]

11. M Maloney and P Burdon (eds), *Wild Law – In Practice* (Routledge 2014); P Burdon (ed), *Exploring Wild Law: The Philosophy of Earth Jurisprudence* (Wakefield Press 2011).
12. K Birrell and D Matthews, 'Re-storying Laws for the Anthropocene: Rights, Obligations and an Ethics of Encounter' (2020) 31 Law and Critique 233; A Grear, 'Legal Imaginaries and the Anthropocene: "Of" and "For"' (2020) 31 Law and Critique 351; D Matthews, 'Law and Aesthetics in the Anthropocene: From the Rights of Nature to the Aesthesis of Obligations' (2019) Law, Culture and the Humanities 1.
13. N Walker, 'Taking Constitutionalism Beyond the State' (2008) 56 Political Studies 519–43, at 524.
14. JW Moore, *Capitalism in the Web of Life* (Verso 2015). 'Onto-epistemology' refers to the 'study of practices of knowing *in* being' (emphasis added), thereby positing an inseparability of being, knowing and acting within the world. As Barad observes: '[t]he separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse'. K Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter* (Duke University Press 2007) at 185 and see 379–81.

This thesis calls for an interruption of structural and asymmetrical power relations with an externalized and objectified 'cheap nature'.[15] It equally rejects the supposedly symmetrical relations between 'humans' reproduced by the formal definition of the Anthropocene, which posits a presumably all-encompassing and unified 'humanity' acting on 'nature'.[16] In so doing, the project invites a reconfiguration of the categories of both human-nonhuman 'subjects' and 'objects' of law to think of them not as separate, pre-given and fixed entities, but as entangled actants who intra-act within more-than-human collectives.[17] At the core of this reconfiguration in legal thinking lies a renewed understanding of the materiality of legal practices. Nonhumans are not merely the inert matter that humans act upon, but intra-active entities that humans act with.[18] From this vantage point, legal relations and the practices they enact can never be limited to purely human concerns nor understood as emerging solely from human action, since humans are always and already part of more-than-human collectives. This raises a question: how should the notion of legal relations be understood if collectives are more-than-human collectives with distributed and entangled agency between humans and nonhumans?

Reinterpreting legal relations within more-than-human collectives demands rethinking the notion of agency along at least two vectors of analysis. On the one hand, it challenges the notion of 'freedom' by suggesting that it begins elsewhere and earlier than with ourselves. Instead, being members of more-than-human collectives requires acknowledging an original and radical dependency on the Other, which ruins any attempt to characterize freedom simply as autonomy: as self-rule, whether individual or collective. This reinterpretation necessarily rejects strong philosophical interpretations of action as the beginning or origin of change, requiring instead a view of action as secondary, as re-active, or more precisely, as responsive.[19] Likewise, the

15. Moore, supra (n 8); Haraway, supra (n 9).
16. For this formal definition, see supra (n 1).
17. The notion of 'intra-action' comes from Barad, who rejects the metaphysics of individualism and suggests an agential realist account where matter is 'a dynamic expression/articulation of the world in its intra-active becoming'. In contrast to the usual 'interaction' that assumes separate individual agencies that precede each action, the neologism 'intra-action' signifies the mutual constitution of entangled human-nonhuman agencies. Barad, supra (n 14) at 33 and 392–3.
18. The literature on the materiality of law is vast. Kang and Kendal usefully distinguish between 'matters' and 'materials': 'if matters are problematizations or "matters of concern" to law, materials are the attributes or properties that are enlisted in acts of interpretation'. As they put it: 'Legal materiality is concerned with how materials *come to matter* by being engaged in the production of legal meaning through interpretive and representational practices'. HY Kang and S Kendall, 'Legal Materiality' in S Stern, M Del Mar and B Meyler (eds), *The Oxford Handbook of Law and Humanities* (Oxford University Press 2019) at 21 (original emphasis). See also HY Kang and S Kendall, 'Introduction', in HY Kang and S Kendall (eds), Special Issue (2019) Law Text Culture, vol 23 Legal Materiality 1–15; S Vermeylen, 'Materiality and the Ontological Turn in the Anthropocene: Establishing a Dialogue between Law, Anthropology and Eco-Philosophy' in LJ Kotzé (ed), *Environmental Law and Governance for the Anthropocene* (Hart Publishing 2017); M Davies, *Law Unlimited* (Routledge 2017); A Pottage, 'The Materiality of What?' (2012) 39:1 Journal of Law and Society 167–83. The materiality of law and agency of nonhuman legal artefacts are also key to posthuman theories. See, eg, the special issue edited by A Grear, E Boulot, I Darío Vargas-Roncancio and J Sterlin, 'Posthuman Legalities: New Materialism and Law Beyond the Human' (2021) 12:1 Journal of Human Rights and the Environment (and all the contributions therein).
19. B Waldenfels, *Antwortregister* (Suhrkamp 1994); K Oliver, *Response Ethics* (Rowman & Littlefield 2019).

responsiveness of entangled agency presupposes a more original passivity, in the form of an embodied affectivity, sensibility and receptivity, absent which there could be no opening to and forms of care within more-than-human worlds.[20] Furthermore, reinterpreting legal relations in terms of intra-actions requires relinquishing any assumption that agency is the exclusive preserve of human beings. In this way, acknowledging the responsiveness of action is also to acknowledge the co-agency of agency itself, such that humans and nonhumans 'act-with' and respond to each other as part of more-than-human collectives.[21] The notion of co-agency that emerges from intra-active relations between humans and nonhumans does not imply, however, an agential inseparability among actants, but accounts instead for a differential ability of actants to act and to respond – a 'response-(in)ability' – in ways that enact differences that matter.[22] For law, this invites questions about how notions of co-agency give rise to new forms of legal relations that include human and nonhuman actants while accounting for their respective differential responsiveness and (in)abilities to respond. In what way, in other words, might the 'co' of co-agency speak to modes of sociality occluded by contemporary accounts of legal collectivity?

A reconfiguring of agency as co-agency between humans and nonhumans with differential (in)abilities to respond to and account for the enactment of their intra-actions implies a recognition of shared yet asymmetrical vulnerabilities that span across more-than-human collectives. Responding to such vulnerabilities demands a reconfiguration of intra-active relations towards caring relations. This reconfiguration requires suspending the protection of certain otherwise presumed independent privileged actants over others, whether 'humans' against 'nonhumans' or particular 'humans' or 'nonhumans' against others. The notion of caring relations, in this sense, constitutes 'a feeling with, rather than a feeling for, others'.[23] From a legal standpoint, this reconfiguration demands a fulfilment of the obligation to care within entangled relational arrangements.[24]

The enactment of caring relations that emerges from the shared material and affective dependency does not, however, reduce or disavow the differences and asymmetries among the destructive and restorative impacts of human and nonhuman actants. A relational disposition of care by no means implies a symmetrical 'response-ability' in the face of shared afflictions, nor does it imply a necessary ability to respond in the first place. Rethinking legal relations through responsive ethics of care instead demands radical reconfigurations not only of who and what to care about but also how to (begin to) care about possible ways of living within more-than-human worlds.

20. M Merleau-Ponty, *Phenomenology of Perception*, trans. D Lande (Routledge 2013); M. Merleau-Ponty, *Nature: Course Notes from the Collège de France*, trans. Robert Vallier (Northwestern University Press 2003); M Merleau-Ponty, *The Visible and the Invisible*, trans. Alphonso Linguis (Northwestern University Press 1968).
21. See 'The Ontology of Knowing, the Intra-activity of Becoming, and the Ethics of Mattering', in Barad, supra (n 14) 353–95; and D Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press 2016). As Haraway argues, becoming is always a 'becoming-with', which offers an onto-epistemology grounded in connection, instead of separation.
22. Barad, supra (n 14) 353–95; Haraway, supra (n 21) 104–17; M-C Petersmann, 'Response-abilities of Care in More-than-Human Worlds' (2021) 12:1 Journal of Human Rights and the Environment 102–24.
23. H Hobart and T Kneese, 'Radical Care Survival Strategies for Uncertain Times' (2020) 38 Social Text 1, at 2.
24. Matthews, supra (n 12).

By remaining open to potential enactments of intra-active human-nonhuman relations, a sense of care for more-than-human worlds is not limited to extant or ontic realities that predetermine specific degrees of protection. Instead, such openness extends caring relations towards potential other worlds to come. Such speculative commitments to caring relations can thereby re-affect and revitalize objectified worlds.[25] What are the consequent structure and dynamic of caring relations in more-than-human worlds and to what extent, and how, might legal collectives be(come) caring? Under what conditions, in other words, can a legal collective come to care for something for which it had been uncaring?

One must also wonder about the political formats in which caring relations within more-than-human collectives could find suitable expression. Political representation, we argue, is a good point of departure. Although it has been argued that participation is a form of representation, and that collective unity is always and only a represented unity, this debate takes for granted that what is represented is a collective of humans.[26] Enacting caring relations within more-than-human collectives, however, implies a radical rethinking of political representation and its limits along several vectors. First, how, if at all, might the 'intercorporeality' of representational practices condition the possibility of representing more-than-human collectives?[27] In particular, how, if at all, might representational practices in politics and law make sense of entangled and intra-active relations between humans and nonhumans?[28] Moreover, how can representational practices account for differential abilities to act within more-than-human collectives, without regressing into familiar relations of subjugation? Second, if representational practices invoke the first-person plural perspective of a collective 'we', in what way, if at all, can they involve the participation of nonhumans as not only the 'we who matter' but also the 'we authors' of collective law-making?[29] Third, if representational practices include and exclude, and render visible and invisible, then what sense can be made of struggles for representation as struggles for inclusion and visibility in more-than-human collectives? This interrogation must also account for what has been or risks being excluded from mattering,[30] as well as considerations of those who demand no inclusion but instead thrive on a politics

25. M Puig de la Bellacasa, *Matters of Care: Speculative Ethics in More Than Human Worlds* (University of Minnesota Press 2017).
26. C Lefort, *Democracy and Political Theory*, trans. D Macey (Polity 1988); B Van Roermund, 'First-Person Plural Legislature: Political Reflexivity and Representation' (2003) 6 Philosophical Explorations 235–52; H Lindahl, 'Inside and Outside Global Law: The 2018 Julius Stone Address' (2019) 41 Sydney Law Review 1.
27. See Merleau-Ponty references supra (n 20); B Waldenfels, *Das leiblichte Selbst: Vorlesungen zur Phänomenologie des Leibes* (Suhrkamp 2000).
28. Barad, supra (n 14).
29. Van Roermund, supra (n 26); H Lindahl, *Authority and the Globalisation of Inclusion and Exclusion* (Cambridge University Press, 2018). A simple reference to 'we', in the first-person plural sense of 'we together', is too massive; it must be parsed into three different but interrelated we-positions: 'we-spokespersons', 'we who matter' and 'we authors'. The 'we-spokespersons' position stands for all those agents which in speaking and acting as participant agents effectively act and speak on behalf of this position. The 'we who matter' position regards the group at stake in collective action. Finally, the 'we authors' position concerns the group that authorizes collective action. Typically, democratic theory interprets legitimacy in terms of the identity between the we 'who matter' and the 'we authors' positions.
30. J. Rancière, *Le partage du sensible: Esthétique et politique* (La Fabrique Éditions 2000).

of refusal or politics for exclusion.[31] That is to say: what are the conditions that govern representation as responsive representation?[32] Fourth, what light might representational practices shed on the temporality and spatiality of more-than-human collectives in the Anthropocene?[33] In particular, are representational practices in politics and law up to the task of articulating intergenerational justice for more-than-human collectives? In what ways might it be possible to deploy distinct, multiple and overlapping forms of intergenerational care for living and non-living actants with whom humans are entangled in ways that can mourn the anthropogenic loss and extinction of beings and for which anthropocentric views of representation share responsibility?[34] Fifth, what role might the materiality of representational practices play in the individuation of more-than-human collectives?[35] And to what extent can emerging technologies – in light of their ability to enact sensing practices that enable a datafied relational awareness and engagement with more-than-human worlds – help mediate human-nonhuman relations as well as the representation of nonhumans in law and politics?[36] In light of the above, representational practices must therefore be reconfigured in light of the 'intercorporeality' of entangled and intra-active relations between humans and nonhumans within more-than-human collectives. As with human collectives, more-than-human collectives are also entangled with struggles for inclusion and exclusion. The dynamics of inclusion and exclusion relate to subjective (ie who are the human and nonhuman subjects affected by the representational practices at stake?) but also temporal (ie whether and how representational practices can mourn extinct worlds and anticipate more-than-human worlds to come) and spatial configurations (ie whether and how representational practices can relate to distant, invisible and potential worlds in the making).

31. GS Coulthard, *Red Skin, White Masks: Rejecting the Colonial Politics of Recognition* (University of Minnesota Press 2014); S Harney and F Moten, *The Undercommons: Fugitive Planning & Black Study* (AK Press 2013).
32. Waldenfels, supra (n 19); H Lindahl, 'Intentionality, Representation, Recognition', in T Bedorf and S Herrmann (eds), *Political Phenomenology: Experience, Ontology, Episteme* (Routledge 2019) 256–76.
33. F Menga, *Lo scandalo del futuro: per una giustizia intergenerazionale* (Storia e letteratura 2017); F Menga, *L'emergenza del futuro. I destini del pianeta e le responsabilità del presente* (Donzelli 2021); H Lindahl, 'Place-holding the Future: Intergenerational Justice in More-than-Human Collectives' (2021) 2 Rivista di Filosofia del Diritto 313–30.
34. K Barad, 'Troubling Time/s and Ecologies of Nothingness: Re-turning, Re-membering, and Facing the Incalculable' (2018) 92 New Formations: A Journal of Culture/Theory/Politics 56; T van Dooren and D Bird Rose, 'Keeping Faith with the Dead: Mourning and De-extinction' (2017) 38:3 Australian Zoologist 375; L Baraitser, *Enduring Time* (Bloomsbury 2017); L Head, *Hope and Grief in the Anthropocene: Re-conceptualising Human-Nature Relations* (Routledge 2016).
35. Individuation, in this context, refers to how a given legal order can be picked out as this or that specific legal order. Traditionally, legal theory has focused on legal orders as inter-human affairs, eg on law as *WTO* law or as *Brazilian* law, but how to make sense of the individuation of legal orders of more-than-human collectives?
36. For an exploration of such questions from distinct angles of inquiry and critique, see, eg, D Chandler, *Ontopolitics in the Anthropocene: An Introduction to Mapping, Sensing and Hacking* (Routledge 2018); L Amoore, *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others* (Duke University Press 2020); F Johns, 'Data, Detection, and the Redistribution of the Sensible in International Law' (2017) 111 American Journal of International Law 57; J Gabrys, *Program Earth: Environmental Sensing Technology and the Making of a Computational Planet* (University of Minnesota Press 2016).

Finally, such reconsidering of concepts of relation, agency, care and representation demands terrestrializing constitutionalism. Against territorial constitutionalism, to terrestrialize constitutionalism acknowledges the vitality and disruptive dynamics that the Anthropocene foregrounds. To terrestrialize practices of more-than-human legal ordering disrupts and suspends the subjective, temporal, spatial and material boundaries of modern constitutionalism. Modern constitutionalism envisions itself as an inquiry into the constitution of a polity through a threefold understanding of the term 'constitution': (1) the make-up of a polity – the basic structure of its legal order; (2) law-making in all its variations and permutations, including constituent power – legal ordering; and (3) the rules and principles that govern authoritative law-making. Terrestrializing constitutionalism requires critical examinations of the presuppositions that govern each of these three dimensions of modern constitutionalism, namely: (1) If constitutions are understood as structuring polities in terms of spatial, temporal, subjective and material jurisdiction, then what transformed interpretations of space, time, subjectivity and agency would be demanded if jurisdiction were to become terradiction?[37] (2) Can constituent power be reconfigured as a response-able 'enworlding' that mourns destruction and extinction? and (3) Might a renewed understanding of relation, agency, care and representation yield rules and principles that provide orientation for responsible law-making?

As can be seen, different philosophical perspectives and conceptual frameworks inform this set of questions. While convergences among those perspectives and frameworks will be welcomed in the course of future inquiry, no attempt will be made to generate a single encompassing position, and divergences of perspectives should be acknowledged as being no less interesting and illuminating than their unification. For this reason, the bibliographical references included in this section are intended to identify texts and positions in ways that invite sustained engagement, without necessarily implying shared allegiance.

3 REGULATORY MODALITIES

From a regulatory perspective, the notion of 'intra-action' within more-than-human collectives that comprise both the living and non-living triggers uncomfortable questions concerning the role, risks and potentials of emerging technologies in the Anthropocene – questions that can no longer be ignored and which invite a different focus on the workings of 'human' and 'natural' regulatory systems in the Anthropocene. These systems can be seen as unfolding through co-constitutive combinations of human and nonhuman agencies, but premised on distinct regulatory modalities, schematically referred to respectively in terms of the 'rule of law' and the 'rule of nature'. Whereas the former refers to practices of legal design or legal ordering traditionally perceived as emanating from social orders, the latter refers to the agency, force and flow of matter and energy traditionally perceived as emanating from nonhuman orders.[38]

37. H Enroth, 'Declarations of Dependence: On the Constitution of the Anthropocene' (2020) Theory, Culture & Society 1–22.
38. The objective here is of course not to reproduce the binary between the social and the natural or between human and nature, but to assess how technology disrupts traditional understandings of regulatory theories that rest on such binaries.

'Natural' systems are essentially 'self-regulatory' in the sense that changes in Earth processes are driven by nonhuman forces of chemistry, biology and physics, with which human forces are interfering. What makes the Anthropocene distinctive is its recognition of the degree to which combinations of such forces are exerted by humans and their technologies. Enzymes, in that sense, can be seen as regulatory agents of cellular change, regulating life by intra-acting in human and nonhuman cells, just as volcanoes or solar radiation management techniques can be recognized for their roles as agents regulating the climate, intra-acting in the chemical composition of the atmosphere. Such agents also regulate humans and their artefacts. Even mild volcanic eruptions, for instance, cause displacements of local communities, and the aftermaths of large eruptions can intimately affect human behaviours and cultures across the planet, as evidenced by the widespread socio-economic disturbances brought on by the 2010 Eyjafjallajökull volcanic eruption in Iceland.

'Human' regulatory systems, by contrast, engage with the practical and moral domains of human regulatees by aiming to steer their behaviours through a range of legal (hierarchical), social (self-regulatory), economic (market) and technological (architectural) modalities.[39] Collective agency and intentionality are what procedurally and substantively dictate both practical and moral regulatory goals as well as the instruments adopted to pursue them. Although human and nonhuman agency can be understood as mutually constitutive, as in the case of volcanic activity, it is the centrality of human intentionality in 'human' regulatory systems that differentiates the latter from 'natural' systems, in which intentionality plays no role.

Today, a number of technological innovations, such as genetic, geo- and climate-engineering technologies, are forcing collisions between these conventionally distinguished 'human' and 'natural' regulatory systems in novel ways.[40] Such human-deployed technologies are capable of operating within the modalities of Earth processes, while also being capable of being steered with the intentionality and purpose that has traditionally been reserved for human regulatory systems. Such novel regulatory intra-action speaks to the 'rule of technological design' – or 'rule by design' – in the sense of a capacity to rule being built in or intra-actively emerging through technology in new ways that transcend prevailing binary distinctions between 'rule of law' and 'rule of nature'. Such a development raises pressing questions of legitimacy, given how unlikely it will be for any technology-driven regulatory measures that seriously compromise human individual and collective agency to be perceived as legitimate governance actions by social, political and judicial institutions.

Such regulatory intra-action raises the question of whether 'human' regulatory systems and the 'rule of law' should take priority over regulatory systems constructed on 'rule by design' and 'rule of nature'. Orwellian technological responses to socio-ecological harms, regardless of their prospects for policy effectiveness, might not survive formal or substantive legal safeguards of human agency, given the rule of law's prioritization of human

39. See L Lessig, *Code: Version 2.0* (Basic Books 2006), and the wealth of commentaries (many of which are critical) that his theory of the four modalities of regulation has generated since.

40. Note that, for the purposes of this section, 'technologies' is referring primarily to those that manipulate and intervene in Earth system processes, such as genetic- and geo-engineering. There are of course many additional technologies whose role in the Anthropocene is not to manipulate Earth processes, but to 'sense' their properties so as to generate distinct forms of human-nonhuman relations. See, eg, Gabrys, supra (n 36); and the chapter on 'Sensing' in Chandler, supra (n 36) at 85–137.

dignity and its requirement that consent dictates substance.[41] Such a belief in the primacy of 'rule of law' over the 'rule of nature', and that the 'rule of law' can enforce such primacy, was on full display in 2015 with the (later reversed) criminal convictions that handed down on six Italian seismologists and a government official for failing to predict the full impact of the L'Aquila earthquake.[42] The human-nonhuman co-agency at play in such events demands a critical reconsideration of anthropocentric understandings of 'regulation' in the first place. More particularly, it forces one to wonder whether such a hierarchy in regulatory modalities can or should survive when they reflect a misplaced belief in the human monopoly on agency. Put differently, one has to wonder whether (local) 'rules of law' can or should continue to trump (planetary) 'rules of nature', especially when the distinction between 'rule of law' and 'rule of nature' is being collapsed. In so far as technology can add normative weight to the 'rule of nature', an enhanced regulatory status for such technologies might be envisaged. The basis for that claim resides in the constitutive quality of technology. Legal, social or economic regulatory modalities always require interfaces to affect 'nature'. Their effects on 'nature', in other words, are always indirect, since such regulatory modalities need to be implemented, complied with and enforced before they take effect. Technologies and 'nature', in contrast, are inter-operable: technological effects on 'nature' are direct and immediate. Such technologies can range from the simple, such as constructing a fence to protect wildlife from traffic, to the highly sophisticated, such as using gene-editing to protect wildlife against anthropogenic environmental calamities. Understood in this sense, technologies intra-act within more-than-human collectives and are directly capable of both subjecting and/or emancipating humans and nonhumans therein.

There is little question that in the Anthropocene, a technological turn is indeed taking shape. This is most evident in cases where law has failed to provide sufficient normative guidance and where it has been ineffective in its implementation. Two telling examples of this are gene-editing techniques that aim to combat alien invasive species or to revive extinct species, and carbon dioxide removal technologies and techniques that aim to arrest or reverse climate change.[43] What role is left, then, for laws that

41. As Raz put it, 'observance of the rule of law is necessary if the law is to respect human dignity. Respecting human dignity entails treating humans as persons capable of planning and plotting their future. Thus, respecting people's dignity includes respecting their autonomy, their right to control their future'. J Raz, *The Authority of the Rule of Law* (Oxford University Press 1979) at 221. On formal and substantive theories of the rule of law, see B Tamanaha, *On the Rule of Law* (Cambridge University Press, 2004) 102–26. Formal notions of the rule of law demand respect for ('thin') rule *by* law, formal legality, or democracy ('thick'). Substantive notions would require individual rights ('thin'), the right of dignity and/or justice, or social welfare ('thick') to be respected.

42. E Cartlidge, 'Why Italian Earthquake Scientists were Exonerated' (10 February 2015) at <www.sciencemag.org/news/2015/02/why-italian-earthquake-scientists-were-exonerated>.

43. On gene-editing to combat threats posed to biodiversity loss see, eg, T Harvey-Samuel, T Ant and L Alphey. 'Towards the Genetic Control of Invasive Species' (2017) 19 Biol Invasions 1683–703. On carbon dioxide removal techniques to combat climate change, see, eg, MJ Mace, CL Fyson, M Schaeffer and WL Hare, 'Large-Scale Carbon Dioxide Removal to Meet the 1.5°C Limit: Key Governance Gaps, Challenges and Priority Responses' (2021) 12 Global Policy 67–81. On the restoration of fisheries resources, see PD Tran, TV Pham, LT Nguyen, H Van Tran and KQ Nguyen, 'Artificial Coral Reefs Restore Coastal Natural Resources' (2019) 7:3 International Journal of Fisheries and Aquatic Studies 128–33. On posthuman legalities, see, eg, the Special Issue on 'Posthuman Legalities: New Materialism and Law Beyond the Human', supra (n 18); and J Norman,

primarily target human agency and that seek to change human behaviours in order to protect 'nature' through its preservation and restoration when such technologies are evidently recreating 'nature' anew? How can one make sense of this as happening within or among more-than-human collectives? How, in other words, can law be understood to operate with such technologically mediated, post-'natural' and post-'human' reconfigurations when both the 'natural' and the 'human' categories that were taken as 'given' throughout modernity are reconstrued? Consider, for example, the traditional, conservation-focused paradigm of environmental laws that target harmful consequences of human agency and operate on a problematic assumption of a stable, 'pristine' environmental 'state of nature'. The process of confronting the lengthy history of human-driven adaptation and change to human-nonhuman landscapes also demands a search for new and transcendent modes of human-technology-nature regulatory cooperation that are capable of 'becoming-with' their ever-evolving relations. Likewise, law's role and utility needs to be reimagined, with a focus on how it can mediate the interrelationships and interdependencies between human interests and rights – with the assumed stability, predictability and certainty they currently require – and the vagaries of Earth system forces, especially since technologies are so often deployed as barriers between human and nonhuman forces.

Such questions might prompt objections to law exercising final authority when sanctioning or conditioning 'natural' events.[44] Legal scholars may also insist, however, that law has been shown to be capable of addressing seemingly insurmountable challenges, and that it possesses a dynamic quality that can allow it to reconnect with 'nature' and technology after such connection had been lost.[45] Surely, rather than monomaniacally trumpeting the virtues of 'rule by design', there is every reason to resist global attempts by oligopolies of powerful and unaccountable private developers of technologies to capture regulatory modalities that parasitize the 'rule of law'.

Posthuman Legal Subjectivity: Reimagining the Human in the Anthropocene (Routledge 2021). On legal personhood beyond the 'human' subject, see M de Leeuw and S Van Wichelen (eds), *Personhood in the Age of Biolegality: Brave New Law* (Palgrave Macmillan 2020); VAJ Kurki and T Pietrzykowski (eds), *Legal Personhood: Animals, Artificial Intelligence and the Unborn* (Springer 2017); and the Special Issue on 'Tradition, Myths and Utopias of Personhood' (2017) 18:5 German Law Journal.

44. See, eg, the criminal convictions of Italian seismologists and government officials for failing to predict the L'Aquila earthquake; Cartlidge, supra (n 42).

45. The 'challenge of regulatory connection' is associated with law's difficulties in responding to newness and is extensively discussed in law and technology literature. Holocenic environmental laws (in the same way as laws regulating technologies) need frequent reconnection with the dynamic present that is the Anthropocene. This need arises because phenomena that appear as fundamentally 'new' (or the intensity and scale of which appear as such) encounter regulatory voids (such as the revival of species gone extinct), but also because existing phenomena have evolved in directions that push them outside the scope of existing regimes initially designed to regulate them (such as the tensions between the EU Habitats Directive and the emerging practice of reintroductions of species). See L Bennett Moses, 'How to Think about Law, Regulation and Technology: Problems with "Technology" as a Regulatory Target' (2013) 5 Law, Innovation and Technology 1–20; R Brownsword, *Rights, Regulation and the Technological Revolution* (Oxford University Press 2008); BR Allenby, 'Governance and Technology Systems: The Challenge of Emerging Technologies', in GE Marchant, BR Allenby and JR Herkert (eds), *The Growing Gap between Emerging Technologies and Legal-Ethical Oversight*, vol 7 (International Library of Ethics, Law and Technology, Springer 2011); D Collingridge, *The Social Control of Technology* (Pinter 1980).

Such objections are as important as they are persuasive, but they also invite counter-arguments insisting that law's authority and primacy have historically been grounded in a focus on the agency and dignity of human collectives – and of particular human collectives specifically – in ways that result all too often in exploitative and asymmetrical legal relations among and between humans and nonhumans. In the day-to-day experience of environmental activists, this asymmetry reveals itself in the skewing of burdens of proof in the regulation of environmental risks or in anthropocentric biases in proportionality tests, among other examples.[46] Yet, as discussed in the previous section, the limitations of anthropocentric legal ordering highlight the importance of reconceptualizing law and legal relations in ways that can recognize the shared yet differential vulnerabilities and response-abilities of both human and nonhuman actants.

Living in the Anthropocene therefore demands confronting the unsettling question of whether the primacy of the 'rule of law' can remain unaffected in the face of climatic and biodiversity catastrophes, as just some examples of Anthropocene symptoms. These regulatory modalities claim authority from, and revolve around, the paramountcy of human agency and dignity premised on law, market instruments and regulatory functions of social norms, in disregard of nonhuman agency and normativities. Beyond the unfolding of Anthropocenic disasters, this question also forces itself upon us by dint of emerging technologies that have the potential directly to alter the functioning of the Earth, thereby offering alternatives to 'rule of law' regulatory interventions. To what extent, then, do such regulatory technologies de-centre human agency, human dignity and law?

In one of the earliest articles on the 'Anthropocene' and its implications, Crutzen drew attention to such questions by holding that '[a] daunting task lies ahead for scientists and engineers to guide society towards environmentally sustainable management during the era of the Anthropocene [which] will require appropriate human behaviour at all scales, and may well involve internationally accepted, large-scale geo-engineering projects, for instance to "optimize" climate'.[47] In Crutzen's vision, 'appropriate human behaviour at all scales' and 'environmentally sustainable management' have become the preserve of 'scientists and engineers', rather than parliaments and legislators. Instead of the 'rule of law', Crutzen pinned his hopes on what we referred to as 'rule by design'. Crutzen's take on technology is a totalizing one, aimed at ruling nothing less than the Earth itself and, as such, equally affecting yet not necessarily benefiting all humans and nonhumans living within it. If the design remains a product of human agency, its effects might well reach beyond human control, agency and autonomy, as evidenced already with the rise of 'algorithmic governmentality'.[48]

46. As Winter puts it: 'As a requirement of the constitutionalisation of economic rights such political will must be justified by a public interest and abide by the principle of proportionality. In this way, public interests triggering restrictions on economic freedoms are in a defensive position from the outset. They are pressed in a higher-ranking constitutional and international legal framework and thereby become depoliticized, meaning that the political discretion of the regulator is not anymore solely based on the government's democratic basis but "conceded" by the now responsible courts. […] But in relation to health and environmental protection policy the general mood has been to ask for scientific proof of adverse effects or – where the precautionary approach is accepted – at least scientific indication of risk.' G. Winter, 'Cultivation Restrictions for Genetically Modified Plants' (2016) European Journal of Risk Regulation 120–43, at 123.

47. PJ Crutzen, 'Geology of Mankind' (2002) 415 Nature 23, at 23.

48. A Rouvroy and B Stiegler, 'The Digital Regime of Truth: From the Algorithmic Governmentality to a New Rule of Law' (2016) 3 La Deleuziana 6; Amoore, supra (n 36).

Technologies might increasingly connect and affect humans and nonhumans by regulating both, at once, in pursuit of an Earth that remains habitable into the future. Such ideals highlight how possible techno-regulatory responses to threats to diverse forms of (non)human life on Earth clash with the formal and substantive pillars of the 'rule of law'.

Has it become inevitable today to accept transgressions of the 'rule of law' by the 'rule by design'? Will such developments be part of the 'new normal' in the Anthropocene, in the same manner as living conditions are being increasingly rhythmed by the 'rule of nature' in the form of pandemics, forest fires, droughts, floods, hurricanes, pests, crop failures and other anthropogenic calamities? What does this imply for the 'value' ascribed to the 'rule of law' and its presumed ability to regulate what is traditionally conceived as an externalized, passive and objectified 'nature'? Is it the case that the viability of future (non)human life itself is being risked in order to cling on to what is considered to be the essence of human dignity – namely human autonomy and agency? Can an ethics of care, or precautionary legal articulations of such ethics, offer any directions towards answering these questions, and do they incentivize or discourage recourse to technologies like solar radiation management and gene-editing? In other words, how can such ethics inform appropriate socio-political debates and decision-making towards developing non-totalizing 'technologies of humility', deployed with care, which attend to differential yet entangled response-(in)abilities of humans and nonhumans in more-than-human collectives, instead of pursuing totalizing 'technologies of hubris'?[49]

Asking these uncomfortable questions is key to a contemplation of the role, risks and potentials of emerging technologies such as de-extinction, climate engineering and gene-editing in the Anthropocene. Besides the fears of uncertain risks that such technologies pose to human and nonhuman life in the long run, and the expansion – instead of suspension – of modernist ideals of Promethean human potency and control over the nonhumans that is associated with them,[50] there might also be a lingering aversion to the idea of relinquishing human monopoly over agency itself, at the risk of letting techno-regulations intrude into anthropocentric notions of agency and regulation.[51] These questions and confrontations are daunting yet pressing,[52] given

49. S Jasanoff, 'Technologies of Humility' (2007) 450 Nature 33; and S Jasanoff, 'Humility in the Anthropocene' (2021) 18:6 Globalizations 839–53.

50. On how such technological ideals of mastery are embedded in imperial, colonial and racial legacies, see TJ Demos, 'To Save a World: Geoengineering, Conflictual Futurisms, and the Unthinkable' (e-flux journal, October 2018). Demos critically analyses geoengineering's techno-utopianism in relation to Arthur Jafa's 2016 video-installation 'Love is the Message, the Message is Death', which Demos sees as foregrounding Indigenous and anticolonial futurisms that are diametrically opposed to the 'future' of a geoengineered planet. On this dissonance with geo-technology, see also F Neyrat (trans. D Ross), 'The Black Angel of History: Afrofuturism's Cosmic Techniques' in Y Hui and P Lemmens (eds), *Cosmotechnics: For a Renewed Concept of Technology in the Anthropocene* (Routledge 2021) 119–33; and A Mitchell and A Chaudhury, 'Worlding Beyond "the" "End" of "the World": White Apocalyptic Visions and BIPOC Futurisms' (2020) 34:3 International Relations 309.

51. On geo-constructivism and ecomodernism as 'Promethean politics', see also F Neyrat, *The Unconstructable Earth: An Ecology of Separation* (Fordham University Press 2018).

52. On the emergent debate about geoengineering and its politics from within a radical left tradition, see also HJ Buck, *After Geoengineering: Climate Tragedy, Repair, and Restoration* (Verso 2019). But see also the call for an International Non-Use Agreement on Solar Geoengineering issued on 17 January 2022, at <https://www.solargeoeng.org/>.

the (in)ability of the 'rule of law' – and 'human' agency alone – to offer a 'safe operating space' in the Anthropocene.[53]

4 INSTITUTIONAL ARCHITECTURES AND COMPLEXITY

The Anthropocene, whether viewed temporally as an enduring and unfolding 'event',[54] a 'rupture' in Earth and life science paradigms,[55] or a historical 'epoch',[56] presents far-reaching conceptual and normative challenges for understanding the scope and scale of what it represents and portends for the institutions of law and governance. In this context, the institutional aspect of law refers to the actual and regular legal practices that are organized, authorized and routinely implemented and enforced, whether one is speaking about domestic, international, regional or non-state, transnational systems.[57] As indicated in the first section above, it is still unclear at a fundamental normative level how intra-active, more-than-human collectives do or could manifest in reconfigured notions of legal and political spatiality, temporality and subjectivity or personhood. Beyond this, however, different sorts of questions abound about law's role in creating and perpetuating the destructive conditions of the Anthropocene, as well as how law should anticipate and respond to what present indicators augur for possible worlds to come. Such questions are driven by an awareness that more and greater transformations are on the horizon, but also that it is unknown what shapes these transformations will take and how their significance for law and governance should be understood, including what law's role is or should be in anticipating, triggering or responding to them. The CitA project treats these as new lines of inquiry about past, present and (im)possible future roles of law, along with explorations of the interpretive and prescriptive challenges that are posed by complex institutional and administrative structural responses to change, uncertainty and unpredictability. Trust in law's potential for transformative change in governance must be tempered by acknowledgement of its exploitive past and present, as well as of the architectural limitations its current structures impose on possibilities for radical transformations to come.

Forward-looking visions of the Anthropocene as an 'emerging crisis', or a moment of 'rupture',[58] can obscure or deflect attention away from the historically contingent and contributory role that law has played in the development of the structures, institutions, processes and paradigms of thought that have enabled the

53. Rockström et al., supra (n 3).
54. Bonneuil and Fressoz, supra (n 7). Environmental scientists recently suggested viewing the Anthropocene as an 'ongoing geological event'. AM Bauer, 'Anthropocene: Event or Epoch?' (2021) 597 Nature 332.
55. C Hamilton, 'The Anthropocene as Rupture' (2016) 3 The Anthropoene Review 93.
56. SL Lewis and MA Maslin, 'Defining the Anthropocene' (2015) 519 Nature 171.
57. Here, we seek to distinguish institutional aspects of law from ideational, cultural, and formal-doctrinal considerations. According to pragmatist John Dewey, for a set of phenomena to be institutionalized is to say that it 'involves a tough body of customs, ingrained habits of action, organized and authorized standards and methods of procedure'. JA Boydston (ed), *The Later Works of John Dewey, 1925–1953: Volume III 1927–1928* (Southern Illinois University Press 2008) at 153. See also N MacCormick, 'Law as Institutional Fact' in N MacCormick and O Weinberger (eds), *An Institutional Theory of Law: New Approaches to Legal Positivism* (Springer 1986) at 49.
58. Hamilton, supra (n 55).

Anthropocene's emergence.[59] Analyses that disregard law's deep historical roots implicitly situate law and its institutions in a position of innocence and invite overly-quick assumptions of its suitability as a powerful, objective and neutral forum for reacting and adapting to the uncertainties and challenges associated with the Anthropocene. Instead, legal analysis must ask how and why certain human societies and ways of worlding have constructed their legal frameworks so as to facilitate and promote subjugative and exploitative relations within more-than-human worlds. It must also account for the problematic treatment of Indigenous peoples and other communities whose knowledges have long identified and critiqued unsustainable and exploitative relationships.[60] Inquiring into the historical contingency of the present 'capitalist world-ecology'[61] opens up critical questions about the sacrosanctity, inevitability and permanence of law, as well as the asymmetrical distribution of the consequences of environmental degradation that it enacts.[62]

To take one example, sovereignty is an established, but historically contingent, legal principle whose sacrosanctity as an elemental principle of both domestic and international public law is worth re-evaluating in light of the Anthropocene.[63] Built into its membranes is a depiction of the Earth as a collection of territorial bundles of natural resources to be exploited by each respective state.[64] It has been relied upon as justification for past colonial projects of 'natural' and '(in)human' resource extraction around the 'Globe', as well as for present extractivist projects within national territories.[65] Law's role in instituting such exploitations must therefore be unpacked, in particular the relations that it enacts between humans and nonhumans in pursuit of paradigms of 'eternal growth'.[66] Law's complicity invites questions about which of its properties are salvageable for enabling caring relations in more-than-human worlds, while law's historical contingency invites other questions about which conditions are changeable or necessarily permanent and inherent to law.

From a future-oriented perspective, law's capacity to change and to respond to planetary transitions is also worth evaluating. These considerations relate to long-lasting debates about how law intra-acts with other non-legal and more-than-human

59. Bonneuil and Fressoz, supra (n 7).
60. For an appeal to the value of Indigenous peoples' knowledges in understanding human-nature relations in the Anthropocene, see C Yumie, A Inoue and P Franco Moreira, 'Many Worlds, Many Nature(s), One Planet: Indigenous Knowledge in the Anthropocene' (2016) 59:2 Revista Brasileira de Política Internacional.
61. Moore, supra (n 14); and E DeLoughrey, J Didur and A Carrigan (eds), *Global Ecologies and the Environmental Humanities: Postcolonial Approaches* (Routledge 2015).
62. Yusoff, supra (n 8); AP Harris, 'The Treadmill and the Contract: A Classcrits Guide to the Anthropocene' (2016) 5 Tennessee Journal of Race, Gender & Social Justice 1; R Nixon, *Slow Violence and the Environmentalism of the Poor* (Harvard University Press 2013).
63. K Bosselmann, 'Environmental Trusteeship and State Sovereignty: Can They Be Reconciled?' (2020) 11 Transnational Legal Theory 47; D Matthews, 'Reframing Sovereignty for the Anthropocene' (2021) 12:1 Transnational Legal Theory 44–77.
64. V De Lucia, 'Rethinking the Encounter Between Law and Nature in the Anthropocene: From Biopolitical Sovereignty to Wonder' (2020) 31 Law and Critique 329.
65. A Anghie, *Imperialism, Sovereignty and the Making of International Law* (Cambridge University Press 2004). For a critique of the category of the 'Globe', see D Chakrabarty, *The Climate of History in a Planetary Age* (University of Chicago Press 2021); and B Latour, '*Onus Orbis Terrarum*: About a Possible Shift in the Definition of Sovereignty' (2016) 44:3 Millennium: Journal of International Studies 305.
66. Moore, supra (n 14).

phenomena often framed as 'systems'. To what extent, if at all, can systemic understandings of law, viewed as a structural and normative systemic ordering, help in reconfiguring how law relates to other non- or more-than-legal 'systems'?[67] How can actual institutional designs constrain or facilitate transformative changes in response to disruptions to Earth processes? Claims that law must become more 'adaptive' to match its increasingly unstable 'externalities'[68] struggle with accounting for and reconciling law's constitutive role in creating and fostering these instabilities in the first place. Moreover, further challenges arise with the need to combine multiple and contradictory scalar lenses, be they planetary, global, international, transnational, regional, local or individual, when reconfiguring collective governance responses to attend to more-than-human concerns.[69] Nor is it clear how, if at all, 'planetary' responses could unfold from better and closer integration and alignment of these multiple and overlapping scalar lenses, or whether institutional changes may instead evolve on more organic, ungoverned and chaotic lines. Questions of degree are also prescient for critically examining the extent to which the instruments and institutions of domestic, international and transnational legal orderings are capable of overcoming their origins as tools of exploitation and dominance over 'nature'.[70] Is the degree of transformation a matter of architecture and technique, such as by giving 'voice' to the 'voiceless',[71] or is it something more fundamental, a complete transformation away from the legal form and political economy of natural resource exploitation?[72] How do increasingly

67. See, eg, J Dryzek, 'Institutions for the Anthropocene: Governance in a Changing Earth System' (2014) 46 British Journal of Political Science 937; R Ison, 'Governing in the Anthropocene: What Future Systems Thinking in Practice?' (2016) 33 Systems Research and Behavioural Science 595; F Berkes, 'Environmental Governance for the Anthropocene? Social-Ecological Systems, Resilience, and Collaborative Learning' (2017) 9 Sustainability 1232; J Donges et al., 'Closing the Loop: Reconnecting Human Dynamics to Earth System Science' (2017) 4:2 The Anthropocene Review 151; G Garver, 'A Systems-based Tool for Transitioning to Law for a Mutually Enhancing Human-Earth Relationship' (2019) 157 Ecological Economics 165.

68. J Viñuales, *The Organisation of the Anthropocene: In Our Hands?* (Brill 2018) at 66.

69. On the complexity of 'scale' in the Anthropocene, see G Dürbeck and P. Hüpkes (eds), *Narratives of Scale in the Anthropocene: Imagining Human Responsibility in an Age of Scalar Complexity* (Routledge 2022). See, eg, the contrasting local and global approaches in S Pincetl, 'Cities in the Age of the Anthropocene: Climate Change Agents and the Potential for Mitigation' (2017) 20 Anthropocene 74; L Karaliotas and G Bettini, 'Urban Resilience, the Local and the Politics of the Anthropocene: Reflections on the Future of the Urban Environment' in K Archer and K Bezdecny (eds), *Handbook of Cities and the Environment* (Edward Elgar 2016); LJ Kotzé, *Global Environmental Constitutionalism in the Anthropocene* (Hart 2016). See also the contrasting planetary and global approaches in Chakrabarty, supra (n 65); and N Clark and B Szerszynski, *Planetary Social Thought: The Anthropocene Challenge to the Social Sciences* (Polity 2020). On the reconfiguration of an 'individual' perspective, see SF Gilbert, J Sapp and AI Tauber, 'A Symbiotic View of Life: We Have Never Been Individuals' (2012) 87 The Quarterly Review of Biology 325; and ZI Jackson, *Becoming Human: Matter and Meaning in an Antiblack World* (New York University Press 2020).

70. For an example in the context of the ecosystem approach in international environmental law, see V De Lucia, 'Bare Nature: The Biopolitical Logic of the International Regulation of Invasive Alien Species' (2019) 31 Journal of Environmental Law 109.

71. RS Abate, *Climate Change and the Voiceless: Protecting Future Generations, Wildlife, and Natural Resources* (Cambridge University Press 2020).

72. I Feichtner, 'Law of Natural Resource Extraction and Money as Key to Understanding Global Political Economy and Potential for Its Transformation', in PF Kjaer (ed), *The Law of Political Economy: Transformation in the Function of Law* (Cambridge University Press 2020); I Feichtner

popular calls for reform, such as for law to recognize the legal personhood of 'nature' and ecosystems, interact with the deep grains of its exploitative structures that maintain and preserve personhood as a privileged instrument by which human and corporate actors assert mastery over and dispossess human and nonhuman others through property relations?[73] Are market-oriented governance interventions, such as the channelling of capitalist tools and finance to prevent deforestation under the REDD+ framework, adequate institutional frameworks for moving beyond capitalizing relations within more-than-human worlds and towards a relationality premised on differential (in)abilities to act in response to shared vulnerabilities?[74]

These avenues of research only begin to partially lay out the terrain of issues that is stimulated by the Anthropocene's encounter with law, but they constitute pivotal questions for understanding the governance and institutional character of what the Anthropocene condition poses for the study of law. It is far from obvious what kind and degree of transformation is required of existing and future legal and institutional frameworks and arrangements, nor how hobbled they are and will be by their historical legacies. Nor is it easily discernible exactly how interests will conflict in ways that facilitate or impede alternative modes of relating in more-than-human worlds. It is by exploring these questions that we hope to take stock of reconfigurations in legal thought and practice that might potentially enhance law's ability to navigate radical socio-ecological transformations for the Anthropocene.

5 CONCLUSION

The Anthropocene, and the radically reconfigured depiction of human-nonhuman relations which it entails, provokes a fundamental reconceptualization of constitutionalizing modalities, processes and institutions. The 'Constitutionalizing in the Anthropocene' project questions how it is possible to constitutionalize living within more-than-human collectives with distinct, distributed and differential agencies and vulnerabilities. It lays out a far-reaching research agenda for rethinking the constitutive role of law along three dimensions.

First, the recharacterization of relations between humans and nonhumans as being premised on caring and differentiated response-(in)abilities requires a reconceptualization of the legal nature of these relationships, including a re-evaluation of freedom as consistent with entangled relations, rather than individual autonomy and separation. Reconceptualizing legal relations along such lines will likewise impact the

and S Ranganathan (eds), 'Symposium: International Law and Economic Exploitation in the Global Commons' (2019) 30 European Journal of International Law 541. See also G Kallis et al., *The Case for Degrowth* (Wiley 2020); JB Schor and AK Jorgenson, 'Is It Too Late for Growth?' (2019) 51 Review of Radical Political Economics 320.

73. J Bennett, *Being Property Once Myself: Blackness and the End of Man* (Harvard University Press 2020); R Nichols, *Theft Is Property! Dispossession and Critical Theory* (Duke University Press 2019); and E Blanco and A Grear, 'Personhood, Jurisdiction and Injustice: Law, Colonialities and the Global Order' (2019) 10 Journal of Human Rights and the Environment 86.

74. It is also noteworthy how REDD+ is disciplining Indigenous peoples as stewards of a global 'green economy'. See J Dehm, *Reconsidering REDD+: Authority, Power and Law in the Green Economy* (Cambridge University Press 2021); J Dehm, 'Indigenous Peoples and REDD+ Safeguards: Rights as Resistance or as Disciplinary Inclusion in the Green Economy?' (2016) 7 Journal of Human Rights and the Environment 170.

conceptual understanding of legal and political representational practices, including the struggles that amount to the constitution of collective selfhood. How can such practices involve the participation of nonhumans as not only the 'we who matter' but also the 'we authors' of collective law-making?

Second, accompanying the Anthropocene is the transcendence of the two traditional modes of regulation: the so-called 'human' and 'natural' regulatory systems. With the development of technologies capable of directly intervening and disrupting Earth processes (such as de-extinction, geoengineering and genetic modification), and the corresponding ability to intentionally alter Earth processes for regulatory effects, we identify the challenges that lie in re-evaluating the role that law does and ought to serve in facilitating or restraining such technological modes of regulatory intervention. The prospect of these emerging regulatory activities dramatically expands the scope of contemporary regulatory discourses, bringing into question the longstanding importance of human agency and dignity in legal and regulatory frameworks.

Third, the Anthropocene calls into question the institutional character of law and its relationship – historic, present and future – with the exploitation of life. Assessments of law's role in ushering structural transformations towards non-exploitative relations with human and nonhuman life must consider how much and which properties of law are salvageable. Likewise, we question whether the reconceptualized relations of the Anthropocene require new architectures or techniques of representation and collective decision-making – giving nonhuman lifeforms 'personhood' – or whether they demand a more fundamental transformation away from the historic and enduring co-constituted legal-economic systems of exploitation.

In sum, this intervention amounts to the establishment of a research agenda for working through the possibilities for Constitutionalizing in the Anthropocene. Rather than identifying how law can 'save the planet', we aim to untangle the more fundamental questions as to how law shapes the possibility and conditions of life, and which shifts in legal thought and practice would allow for and enact forms of living that embody the entangled, differentiated and vulnerable collectives that characterize human-nonhuman relations in the Anthropocene.