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# FOREWORD—ANTHROPOCENIC DISRUPTION, COMMUNITY RESILIENCE AND LAW

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# FOREWORD—ANTHROPOCENIC DISRUPTION, COMMUNITY RESILIENCE AND LAW

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*"It would be . . . foolish for an individual to give up living upon learning he is mortal, or to refuse medicine early in the course of a dangerous illness."*[1]

*–Benjamin H. Strauss, Scott Kulp & Anders Levermann*

Since the First Agricultural (or Neolithic) Revolution, humans have been the primary agents of both biospheric and sociospheric change. Modern human societies evolved in an ecosystem of abundance in which human agency and consumption could conveniently ignore the problem

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1. Benjamin H. Strauss et al., *Reply to Boyd et al.: Large Long-Term Sea Level Projections Do Not Mean Giving Up on Coastal Cities*, 113 PROC. NAT'L ACAD. SCI. E1330, E1330 (2016); *see also* Ezra Boyd et al., *Although Critical, Carbon Choices Alone Do Not Determine the Fate of Coastal Cities*, 113 PROC. NAT'L ACAD. SCI. E1329, E1329 (2016) (responding to Benjamin H. Strauss et al., *Carbon Choices Determine US Cities Committed to Futures Below Sea Level*, 112 PROC. NAT'L ACAD. SCI. 13508 (2015), https://www.pnas.org/content/pnas/112/44/13508.full.pdf [hereinafter *Carbon Choices*]).

of natural capital.[2] At today's peak of humanity, first-world humans personally produce virtually nothing to sustain their respective individual lives.[3] Instead, distant agro-industrial systems and global economies of scale mass-produce the resources that modern humans *simply* acquire through, often anonymous, exchange transactions in order to satisfy their survival and welfare needs. By the second half of the twenty-first century, the Anthropocene is expected to fundamentally disrupt complex human networks of resource extraction, labor division, and market exchange.[4] Energy will become scarce,[5] climate change will make weather and water hostile,[6] and large-scale digital and industrial technologies will outgrow

2. *See infra* note 44 and accompanying text.

3. Even though all "humans depend on a non-negotiable biophysical substrate for their existence." Benjamin Cooke et al., *Dwelling in the Biosphere: Exploring an Embodied Human-Environment Connection in Resilience Thinking*, 11 SUSTAINABLE SCI. 831, 832 (2016); *see also* PAUL HAWKEN ET AL., NATURAL CAPITALISM: THE NEXT INDUSTRIAL REVOLUTION 149 (Earthscan 10th ed. 2010) ("[I]t is ultimately the capacity of the photosynthetic world and its nutrient flows that determine the quality and the quantity of life on earth.").

4. For a detailed discussion, see *infra* Sections I.B–C. *Cf.* James Ming Chen, *Anthropocene Agricultural Law*, 3 TEX. A&M L. REV. 745, 770 (2016) ("The prosperity that marks humanity's rise during the Anthropocene masks an abiding menace of extinction."); Joshua Farley, *Law for the Anthropocene*, 64 BIOSCIENCE 1188, 1188 (2014) (reviewing SOCIAL-ECOLOGICAL RESILIENCE AND LAW (Ahjond S. Garmenstani & Craig R. Allen eds., Columbia Univ. Press 2014)) ("The challenge of the Anthropocene is to build social-ecological systems resilient to profound anthropogenic changes, therefore avoiding the collapse of civilization."); Will Steffen et al., *The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?*, 36 AMBIO 614, 619 (2007) ("Collapse of modern, globalized society under uncontrollable environmental change is one possible outcome.").

5. *See* Louis J. Kotzé, *Human Rights and the Environment in the Anthropocene*, 1 ANTHROPOCENE REV. 252, 269 (2014) ("Scientific predictions . . . are more or less in agreement that anthropogenic ecological disasters will increase in frequency and severity, and it is therefore likely that the intra- and intergenerational divide between rich and poor people will only deepen as ecological disasters and food and energy scarcity in the Anthropocene intensify."). *See generally* Shane Mulligan, *Energy, Environment, and Security: Critical Links in a Post-Peak World*, GLOBAL ENVTL. POL. Nov. 2010, at 79 (discussing energy scarcity and its impacts globally).

6. *See*, *e.g.*, Kristina A. Dahl et al., *Effective Inundation of Continental United States Communities with 21st Century Sea Level Rise*, ELEMENTA (July 12, 2017), https://www.elementascience.org/articles/10.1525/elementa.234/ (discussing how tidally-driven coastal flooding caused by sea-level rise has the potential to "alter[] the landscape and livability of coastal communities decades before sea level rise causes coastal land to be permanently inundated," and identifying U.S. communities that "will face effective inundation . . . within the next 30 years"); *Carbon Choices*, *supra* note 1 (modelling the effect of anthropogenic carbon emissions on long-term sea-level rise and computing the current U.S. "population living on [inundation-]endangered land at municipal, state, and national levels). For a discussion of the domino effects of large-scale human migration of hundreds of millions of people from heavily-populated coastal communities to landlocked communities forced by sea-level rise, see generally Charles Geisler & Ben Currens, *Impediments to Inland Resettlement Under Conditions of Accelerated Sea Level Rise*, 66 LAND USE POL'Y 322 (2017); Mathew E.

their supportability.[7] All human systems for "wealth" generation and attendant "progress"[8] created since the Second Industrial Revolution will become disrupted, unstable, and often non-resilient, and will encounter drastic corrections in overall sustainability and scale.[9] Humans will

Hauer, *Migration Induced by Sea Level Rise Could Reshape the U.S. Population Landscape*, 7 NATURE CLIMATE CHANGE 321 (2017). For a concrete case study that models the imminent and increasing risks and the domino effects of tidal and storm-surge flooding in Miami-Dade County, Florida, see Steven A. McAlpine & Jeremy R. Porter, *Estimating Recent Local Impacts of Sea-Level Rise on Current Real-Estate Losses: A Housing Market Case Study in Miami-Dade, Florida*, 37 POPULATION RES. & POL'Y REV. 871, 871 (2018) ("[T]he accrued current cost, in terms of real-estate dollars lost, due to recurrent tidal flooding and projected increases of flooding in Miami-Dade County. . . . total[ed] over $465 million in lost real-estate market value between 2005 and 2016 [alone]."); *see also* Jesse M. Keenan et al., *Climate Gentrification: From Theory to Empiricism in Miami-Dade County, Florida*, ENVTL. RES. LETTERS (Apr. 23, 2018), https://iopscience.iop.org/article/10.1088/1748-9326/aabb32/meta (assessing "climate gentrification" in Miami-Dade County, that is, how climate change impacts affect the marketability and valuation of property with differing degrees of elevation, environmental exposure and resilience functionality).

7. *See* Michael R. Gillings & Elizabeth L. Hagan-Lawson, *The Cost of Living in the Anthropocene*, EARTH PERSP., 2014, art. 2, at 1, https://earth-perspectives.springeropen.com/articles/10.1186/2194-6434-1-2 ("Modern societies are highly dependent on the physical and electronic links between larger and larger regions, and especially upon the transport of matter and energy."); Andreas Malm & Alf Hornborg, *The Geology of Mankind? A Critique of the Anthropocene Narrative*, 1 ANTHROPOCENE REV. 62, 64 (2014) ("The affluence of high-tech modernity cannot possibly be universalized—become an asset of the species—because it is predicated on a global division of labour that is geared precisely to abysmal price and wage differences between populations."); *see also* Vincent Blok, *Earthing Technology: Towards an Eco-Centric Concept of Biomimetic Technologies in the Anthropocene*, 21 TECHNÉ 127, 130 (2017) ("[I]t is becoming increasingly clear . . . that humanity is using more natural resources than Earth can provide, and that we need two or more planets to support our modern way of living in the future . . . .").

It should be noted that "scarcity," "hostility," and "insupportability" are human constructs (or artifacts). Whether humans and, more to the point, our long-term ecosystem and biosphere can or cannot adapt to those evolving conditions of the Earth's future (as experienced and construed as external "limitations" or "restrictions" only by humans) is of concern to only humans and their utility-driven abstractions. *Cf.* SHELDON SOLOMON ET AL., THE WORM AT THE CORE: ON THE ROLE OF DEATH IN LIFE 66 (2015) ("[Modern humans'] capacity to strategize, to make decisions, to design and to plan based on an imagined future represented by words and symbols, is something no other creature on earth was then, or is now, able to do.").

8. For foundational criticism of the human artifacts of "wealth" (or "welfare") and "progress," see *infra* note 24 and accompanying text. For criticism of the "Eurocentric and techno-determinist vistas" of the Anthropocene, see Jeremy Baskin, *Paradigm Dressed as Epoch: The Ideology of the Anthropocene*, 24 ENVTL. VALUES 9 (2015); *see also* Jason W. Moore, *The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis*, 44 J. PEASANT STUD. 594, 596 (2017); Jason W. Moore, *The Capitalocene Part II: Accumulation by Appropriation and the Centrality of Unpaid Work/Energy*, 45 J. PEASANT STUD. 237 (2018).

9. *Cf.* Steffen et al., *supra* note 4, at 620 ("Enormous, immediate challenges confront humanity over the next few decades as it attempts to pass through a bottleneck of continued population growth, excessive resource use and environmental deterioration."); *see also* Andrew J. Hoffman & P. Devereaux Jennings, *Institutional Theory and the Natural Environment:*

relinquish their roles as primary sociospheric change agents, and the accelerating scarcity and redistribution of biospheric resources, caused by a multiplicity of disequilibria in the Earth system, will become the principal driver of social transformation and regression.[10]

By either choice or force, humanity will have to adapt and change[11]—both *rapidly* and *radically*.[12] Yet, it appears highly unlikely that change—and sufficient collective change *agency* in the first place—can be adequately built and established from the bottom up. Market and consumerist forces are too small, slow, narcissistically self-absorbed, denialist, and private-actor-centric to efficiently address the magnitude and acceleration of Anthropocenic problems faced.[13] Similarly, systemic course reversion will likely resist institution from the top down. Regulatory and governmental forces—and the processes of their corralling—are too large, rigid, uncompromisingly partisan, populist, and

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*Research in (and on) the Anthropocene*, 28 ORG. & ENV'T 8, 17 (2015) ("[T]he majority of the world's inhabitants in Anthropocene Society will lose."). "[S]ocietal transformation around the Anthropocene Era will include, by definition, disruptive forces and voices that challenge core institutions of the market society." *Id.* at 19.

10. *Cf.* Rory Rowan, *Notes on Politics After the Anthropocene*, *in After the Anthropocene: Politics and Geographic Inquiry for a New Epoch*, 38 PROGRESS HUM. GEOGRAPHY 439, 447 (2014) ("[T]he Anthropocene creates opportunities to cast the planet itself [as] a key player in the drama of human politics rather than simply its stage."). *See generally* Philip E. Slater, *On Social Regression*, 28 AM. SOC. REV. 339 (1963).

11. *See*, *e.g.*, Athena D. Mutua, *Framing Elite Consensus, Ideology and Theory & a Classcrits Response*, 44 SW. L. REV. 635, 650 (2015) (describing that, as a result of climate change, the United States and "world *will* adapt to the forthcoming changes either reactively or proactively").

12. *Cf.* Carl Folke et al., *Social-Ecological Resilience and Biosphere-Based Sustainability Science*, 21 ECOLOGY & SOC'Y, no. 3, art. 41, 2016, at 9 ("The Anthropocene calls for rapid transformations toward global sustainability."); Hoffman & Jennings, *supra* note 9, at 12 ("A response to the Anthropocene Era calls for a new and as yet undefined social order called 'Anthropocene Society,' which would transform many preexisting beliefs within multiple segments of society.").

13. When, among others, twenty-seven Nobel laureate economists come together as co-signors to endorse a statement on carbon dividends and to unanimously advocate governmental intervention in the marketplace in the form of a Pigouvian carbon tax aimed at "correcting a well-known market failure" and, thus, addressing global climate change, *see Economists' Statement on Carbon Dividends*, WALL ST. J.: OPINION (Jan. 16, 2019, 6:55 PM), made available at https://www.wsj.com/articles/economists-statement-on-carbon-dividends-11547682910 [https://perma.cc/4AJP-ZGB5], it appears abundantly clear that the market's ability to self-regulate anything (via exchange transactions, association, property rights and the profit motive) of a more polycentric, multiplex, multimodal and multiscalar, thus, dynamic and *communal* dimension is limited to nonexistent. *Cf.* R.H. TAWNEY, THE ACQUISITIVE SOCIETY 6 (1920) ("Yet all the time the principles upon which industry should be based are simple, however difficult it may be to apply them; and if they are overlooked it is not because they are difficult, but because they are elementary. They are simple because industry is simple.").

public-system-centric to bring about the tailored efficiency of resilience solutions needed.[14] Arguably then, a third-order, hybrid path for transformation must rather be built from within—namely, the *middle out*. "Middle-out social engineering," as conceptualized herein, both fosters and requires resilience and adaptability at the meso-level—the community level—of sociopolitical and socioeconomic organization and governance. Cooperative-community resilience, in turn, both fosters and requires "smart communities," namely, those with semi-closed, self-supporting economies; sustainable, self-defensible forms of governance and government; inclusive, self-referential social norms and social routines; and well-grounded, well-scaled legal supports and regulatory practices.

The present, at best, is at the early-ideation stage for socioeconomic and sociolegal transformation in the accelerating Anthropocene.[15] Accordingly, this Foreword aims first to conceptualize the larger and, to date, mostly muted conversation of how more self-reliant, shock-resistant, and sustainable community may be built efficiently at the advent of "Anthropocenic disruption."[16] Second, this Foreword posits that the conversation on middle-out social engineering should be situated more broadly in the context of law and its social function and, thus, more than just reflexively, also in the context of the (legal) education of future-generation social engineers and "resilience producers." The Foreword, therefore, also attempts a brief cross-cutting inquiry into the *precepts* of genuine cooperative-community innovation and intrapreneurship in the context of "resilience production" and "law learning."[17]

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14. *Cf.* Folke et al., *supra* note 12 ("[I]mproved biosphere stewardship in the Anthropocene is not a top-down global approach enforced on people, nor solely a bottom-up approach. It is a process engaging people to collaborate across levels and scales . . . .").

15. *See* Gisli Palsson et al., *Reconceptualizing the 'Anthropos' in the Anthropocene: Integrating the Social Sciences and Humanities in Global Environmental Change Research*, 28 ENVTL. SCI. & POL'Y 3, 8 (2013) ("It is now time for us to articulate the culture of emerging Anthropocene societies by drawing upon natural scientists, humanities scholars, and social scientists, emphasizing the new fusion of the natural and the ideational.").

16. "Anthropocenic disruption," as a term of art coined herein, is discussed, *infra* Sections I.B–C.

17. Law learning is commonly known as "legal education." To "educate," from Latin *educare*, derivative of *educere*, means to "bring out," therefore, to "cultivate or train." WALTER W. SKEAT, AN ETYMOLOGICAL DICTIONARY OF THE ENGLISH LANGUAGE 185 (Oxford 1882). Accordingly, a (societal) purpose larger than the living being (not necessarily human) to be trained and cultivated controls education. Utility applies—and where there is utility, there is bargain, exchange, commoditization and value exploitation. Hierarchy also applies—and where there is hierarchy, there is control, subordination, institutionalization and value-exploitation coordination. In contrast, to "learn" derives from Moseo-Gothic *lis-nan* where the base *lis* probably meant to "find out" and the ending *nan* meant to "become," thus, in combination, to "become knowledgeable" and, literally, to "find one's way." From the same base *lis* also comes

## I. ANTHROPOCENIC DISRUPTION

*"At this stage . . . we are still largely treading on* terra incognita*."*[18]

*–Paul J. Crutzen*

Twenty-first-century humans are reaching planetary boundaries to sustain life.[19] Simultaneously, they are reaching their cooperative and organizational boundaries to absorb both the social costs and the "ecosystem costs"[20] of modern civilization and economies of scale. The core of this problem lies in an orthodox form of human delusionality (which is traceable to enlightenment thought aimed,[21] in its final though

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the Moseo-Gothic *laisjan*, to "make to know," thus, to "teach." *Id.* at 326. Learning and teaching are therefore an inseparably joint activity. A learner can only become knowledgeable by making himself to know. A teacher can only help the learner to become knowledgeable by finding her own way first. Simultaneously, learner and teacher each learn *and* teach—both, individually and symbiotically with each other. Accordingly, "law learning" is substituted herein as the preferred term to describe law school's core function and activity.

18. Paul J. Crutzen, *Geology of Mankind*, 415 NATURE 23, 23 (2002); *see also* Steffen et al., *supra* note 4, at 614 ("Human activities have become so pervasive and profound that they rival the great forces of Nature and are pushing the Earth into planetary *terra incognita*.").

19. That is, all life on Earth, not just human life and, accordingly, not merely carrying capacity for the human species. *See, e.g.*, HAWKEN, *supra* note 3, at 3 ("Humankind has inherited a 3.8-billion-year store of natural capital. At present rates of use and degradation, there will be little left by the end of the [twenty-first] century."); Steffen et al., *supra* note 4, at 614 ("The Great Acceleration," i.e., the sudden acceleration of the modern human enterprise after the end of the Second World War, "is reaching criticality," and noting that "[w]hatever unfolds, the next few decades will surely be a tipping point in the evolution of the Anthropocene"); Paul J. Crutzen & Eugene F. Stoermer, *The "Anthropocene"*, GLOBAL CHANGE NEWSL. (The Int'l Geosphere-Biosphere Programme), May 2000, at 17 ("In a few generations mankind is exhausting the fossil fuels that were generated over several hundred million years."); *see also* Kenneth E. Boulding, *The Economics of the Coming Spaceship Earth*, *in* 3 ENVIRONMENTAL QUALITY IN A GROWING ECONOMY: ESSAYS FROM THE SIXTH RFF FORUM 3, 3–5 (Henry Jarrett ed., RFF Press 2011) (1966) (discussing the transition of the Earth's carrying capacity from an open system to a closed system); Douglas A. Kysar, *Sustainability, Distribution, and the Macroeconomic Analysis of Law*, 43 B.C. L. REV. 1, 27 (2001).

> Ecological economists . . . believe that humanity has now moved to the 'spaceman economy' . . . in which human productive capacity has outstripped the carrying capacity of the earth; that is, the binding constraint on material throughput is no longer our capacity to produce, but the earth's capacity to generate resource inputs and absorb waste outputs.

*Id.* "Economists in particular . . . have failed to come to grips with the ultimate consequences of the transition from the open to the closed earth." Boulding, *supra*.

20. Or "natural costs," namely, the externalities of human productivity and consumption imposed on Earth's natural capital.

21. *Cf.* THEODOR W. ADORNO, *Culture Industry Reconsidered*, *in* THE CULTURE INDUSTRY: SELECTED ESSAYS ON MASS CULTURE 106 (J.M. Bernstein ed., 1991) ("The total effect of the culture industry is one of anti-enlightenment, in which . . . enlightenment, that is the progressive technical domination of nature, becomes mass deception and is turned into a

futile consequence, at transcending, through reason, the closedness of the human biological system known as mortality): contrary to indoctrinated belief, human (economic) welfare production in modern "acquisitive societies"[22] is never the production of genuine welfare[23] in an ecosystemic, *planet-Earth-wholistic* sense. Rather, it is the frivolous consumption, and therefore the irreversible destruction, of finite high-grade and low-entropy energy and material resources extracted, and then irreplaceably lost, from the Earth's one-and-only biosphere.[24]

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means for fettering consciousness."); TAWNEY, *supra* note 13, at 18–19 ("The magnificent formulæ in which a society of farmers and master craftsmen enshrined its philosophy of freedom . . . [have become] fetters used by an Anglo-Saxon business aristocracy to bind insurgent movements on the part of an immigrant and semi-servile proletariat."); *see also* Anna Grear, *Deconstructing* Anthropos*: A Critical Legal Reflection on 'Anthropocentric' Law and Anthropocene 'Humanity'*, 26 L. & CRITIQUE 225, 234 (2015) ("Western rational agency—including that of law—relies upon a profound separation between rationality and nature and a universalising body transcendence.").

22. TAWNEY, *supra* note 13, at 29.

> But to say that the end of social institutions is happiness, is to say that they have no common end at all. For happiness is individual, and to make happiness the object of society is to resolve society itself into the ambitions of numberless individuals, each directed towards the attainment of some personal purpose.
>
> Such societies may be called Acquisitive Societies, because their whole tendency and interest and preoccupation is to promote the acquisition of wealth.

*Id.*

23. "Welfare" is merely another artifact based on human utility judgments. *See supra* note 7.

24. *See* René Reich-Graefe, *Deconstructing Corporate Governance: Director Primacy Without Principle?*, 16 FORDHAM J. CORP. & FIN. L. 465, 498–99 (2011); *see also* NICHOLAS GEORGESCU-ROEGEN, THE ENTROPY LAW AND THE ECONOMIC PROBLEM, *reprinted in* VALUING THE EARTH: ECONOMICS, ECOLOGY, ETHICS 75, 85 (Herman E. Daly & Kenneth N. Townsend eds., 1993).

> Every time we produce a Cadillac, we irrevocably destroy an amount of low entropy that could otherwise be used for producing a plow or a spade. In other words, every time we produce a Cadillac, we do it at the cost of decreasing the number of human lives in the future. Economic development through industrial abundance may be a blessing for us now and for those who will be able to enjoy it in the near future, but it is definitely against the interest of the human species as a whole, if its interest is to have a lifespan as long as is compatible with its dowry of low entropy.

*Id.*; William Rees, *in* E.F. SCHUMACHER, SMALL IS BEAUTIFUL: ECONOMICS AS IF PEOPLE MATTERED 7 (Hartley & Marks 1999) (1973) [hereinafter SMALL IS BEAUTIFUL].

> All our toys and tools, factories, and infrastructure (our exosomatic organs) require continuous flows of energy and material from and to nature for their production, maintenance, and operation. Economists talk about increasing output, of maximizing resources or labor productivity, but the reality is that no matter how efficient the economy becomes, economic production requires material consumption.

*Id.*

### A. *The Anthropocene as Paradigm Change*

As, to date, an unofficial geological time unit in the Earth's history, following either the present interglacial[25] Holocene Epoch or the Meghalayan Age (i.e., the most recent formal subdivision of the Holocene Epoch),[26] the Anthropocene, however defined[27] or

25. For a general discussion of interglacials in the Quaternary Period (i.e., the current geological period), see Jan Zalasiewicz et al., *Are We Now Living in the Anthropocene?*, GSA TODAY, Feb. 2008, at 4, 4–5 [hereinafter *Living in the Anthropocene?*].

26. The International Commission on Stratigraphy (ICS), a constituent scientific body in the International Union of Geological Sciences (IUGS), currently operates an Anthropocene Working Group (AWG) through the ICS's Subcommission on Quaternary Stratigraphy (SQS). The AWG's "remit . . . is to examine the status, hierarchical level and definition of the Anthropocene as a potential new formal division of the Geological Time Scale." *Newsletter 1* (Anthropocene Working Group of the Subcommission on Quaternary Stratigraphy/Int'l Comm'n on Stratigraphy), Dec. 2009, at 1, http://quaternary.stratigraphy.org/wp-content/uploads/2018/08/Anthropocene-Working-Group-Newsletter-No1-2009.pdf [https://perma.cc/64ZW-P9TA]. In recent years, the AWG has considered various recommendations and proposals to officially recognize and define the Anthropocene as a formal geological unit—either: (i) at the hierarchical level of a geological epoch as the current Holocene Epoch (with the result that, if the Anthropocene were to be recognized at such level, the Holocene would have terminated); (ii) at the lower hierarchical level of a geological age (in which case the Anthropocene would be a new, fourth subdivision of the Holocene Epoch and the current, most recent subdivision, the Meghalayan Age, would have terminated accordingly); or (iii) at the higher hierarchical level of a geological period (in which case the entire Quaternary Period would have ended). To date, none of the AWG's proposals have reached the stage of formal ratification by either the SQS/ICS or the IUGS. *Id.* at 4; Anthropocene Working Group, *Working Group on the 'Anthropocene'*, SUBCOMMISSION ON QUATERNARY STRATIGRAPHY, http://quaternary.stratigraphy.org/working-groups/anthropocene/ [https://perma.cc/864Z-RSJN]; *see also Living in the Anthropocene?*, *supra* note 25, at 7 ("Sufficient evidence has emerged of stratigraphically significant change (both elapsed and imminent) for recognition of the Anthropocene—currently a vivid yet informal metaphor of global environmental change—as a new geological epoch to be considered for formalization by international discussion."); Jan Zalasiewicz et al., *The Anthropocene: A New Epoch of Geological Time?*, 369 PHIL. TRANSACTIONS ROYAL SOC'Y A 835, 840 (2011) [hereinafter *A New Epoch*] ("The Anthropocene, on current evidence, seems to show global change consistent with the suggestion that an epoch-scale boundary has been crossed within the last two centuries."); Anthropocene Working Group, *supra*.

27. The AWG has referred to the Anthropocene as "a term widely used since its coining by Paul Crutzen and Eugene Stoermer in 2000 to denote the present time interval, in which many geologically significant conditions and processes are profoundly altered by human activities." Anthropocene Working Group, *supra* note 26. The AWG has enumerated those conditions and processes as follows:

> [A]n order-of-magnitude increase in erosion and sediment transport associated with urbanization and agriculture; marked and abrupt anthropogenic perturbations of the cycles of elements such as carbon, nitrogen, phosphorus and various metals together with new chemical compounds; environmental changes generated by these perturbations, including global warming, sea-level rise, ocean acidification and spreading oceanic 'dead zones'; rapid changes in the biosphere both on land and in the sea, as a result of habitat loss, predation, explosion of domestic animal

recognized,[28] is real and is principally caused by the rise of the human technosphere,[29] particularly, in the wake of the rapid population increases[30] and hydrocarbon-driven industrial revolutions beginning in Europe around 1800 CE.[31] The Anthropocene is also a genuine Kuhnian[32] paradigm shift[33] away from anything and everything encountered earlier

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> populations and species invasions; and the proliferation and global dispersion of many new 'minerals' and 'rocks' including concrete, fly ash and plastics, and the myriad 'technofossils' produced from these and other materials.

*Id.*; *see also* Crutzen & Stoermer, *supra* note 19, at 17 ("Considering [the] . . . major and still growing impacts of human activities on earth and atmosphere, . . . it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term 'anthropocene' for the current geological epoch."); Steffen et al., *supra* note 4, at 614. The causes of Anthropocenic change are the "human-driven alterations of *i)* the biological fabric of the Earth; *ii)* the stocks and flows of major elements in the planetary machinery such as nitrogen, carbon, phosphorus, and silicon; and *iii)* the energy balance at the Earth's surface." *Id.*

28. According to the AWG, in order "to be accepted as a formal term[,] the 'Anthropocene' needs to be (a) scientifically justified (i.e. the 'geological signal' currently being produced in strata now forming must be sufficiently large, clear and distinctive) and (b) useful as a formal term to the scientific community." Anthropocene Working Group, *supra* note 26 (emphasis omitted).

29. *See* Carsten Herrmann-Pillath, Economics of the Anthropocene 1–2 (Aug. 23, 2017) (unpublished manuscript), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3024511.

30. *See, e.g.*, Crutzen & Stoermer, *supra* note 19, at 17 (citations omitted) ("The expansion of mankind, both in numbers and per capita exploitation of Earth's resources has been astounding. . . . During the past 3 centuries human population increased tenfold to 6000 million . . . . Urbanisation has even increased tenfold in the past century.").

31. *See* Steffen et al., *supra* note 4, at 614 ("The Anthropocene began around 1800 with the onset of industrialization, the central feature of which was the enormous expansion in the use of fossil fuels."); *see also* Crutzen, *supra* note 18.

> The Anthropocene could be said to have started in the latter part of the eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane. This date also happens to coincide with James Watt's design of the steam engine in 1784.

*Id.*

32. *See generally* THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS (1962) (introducing the concept of paradigm shifts to describe scientific progress).

33. *See* Hoffman & Jennings, *supra* note 9, at 12 ("In social science and philosophical terms, the Anthropocene Era leads to a transformative cultural shift that is akin to the Enlightenment of the 17th and 18th centuries."); Steffen et al., *supra* note 4, at 614 ("The phenomenon of global change represents a profound shift in the relationship between humans and the rest of nature."); Will Steffen et al., *Planetary Boundaries: Guiding Human Development on a Changing Planet*, 347 SCI. 736, 736 (2015) ("There is an urgent need for a new paradigm that integrates the continued development of human societies and the maintenance of the Earth system . . . in a resilient and accommodating state."); *see also* Liesel Carlsson, 21 HUM. ECOLOGY REV., no. 2, 2015, at 167, 171 (reviewing ROBERT DYBALL & BARRY NEWELL, UNDERSTANDING HUMAN ECOLOGY: A SYSTEMS APPROACH TO SUSTAINABILITY (2014)) ("We are now sitting at a historical juncture where the feedback loop

in the world's history. Not only is there no *human* experiential record in the history of planet Earth,[34] there is no *planetary* experiential record[35] of how life systems on Earth will cope with the fact that "humankind ha[s] itself become an agent of geological change."[36] And not just *an* agent, but *the* agent.[37] Collective human agency is engaging all contemporary *and* future societies in the largest possible—thus, truly global—yet, "unintended experiment . . . on [their] own life support system."[38] Some

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coming from increasing damage to ecosystem and human health is forcing a new cultural paradigm."); Rowan, *supra* note 10.

> The Anthropocene is not a *problem* for which there can be a *solution*. Rather it names an emergent set of geo-social conditions that already fundamentally structure the horizon of human existence. It is thus not a new factor that can be accommodated within existing conceptual frameworks, . . . but signals a profound shift in the human relation to the planet that questions the very foundations of these frameworks themselves.

*Id.*

34. *Cf.* Nicholas A. Robinson, *Fundamental Principles of Law for the Anthropocene?*, 44 ENVTL. POL'Y & L. 13, 13 (2014) ("In the Anthropocene, every dimension of life is different from times past."); Zoltán Boldizsár Simon, *Why the Anthropocene Has No History: Facing the Unprecedented*, 4 ANTHROPOCENE REV. 239, 239 (2017) ("[T]he tendency to invoke modern historical thinking in trying to make sense of the Anthropocene amounts to an untenable, self-contradictory, and self-defeating enterprise.").

35. *See* Crutzen, *supra* note 18, at 23 ("At this stage, however, we are still largely treading on *terra incognita*."); Steffen et al., *supra* note 4, at 614; *cf. Living in the Anthropocene?*, *supra* note 25, at 6.

> The present interval might evolve into the "super-interglacial" envisaged by Broecker, with Earth reverting to climates and sea levels last seen in warmer phases of the Miocene or Pliocene, most likely achieved via a geologically abrupt rearrangement of the ocean-atmosphere system. Such a warm phase will likely last considerably longer than normal Quaternary interglacials. It is not clear that an equilibrium comparable to that of pre-industrial Quaternary time will eventually resume.

*Id.* (citations omitted).

36. Katrina Forrester, *The Anthropocene Truism*, NATION (May 12, 2016), https://www.thenation.com/article/the-anthropocene-truism/ [https://perma.cc/ZRC9-ZCX8].

37. *See, e.g.*, Herrmann-Pillath, *supra* note 29 (stating that the rapid growth of human-made material infrastructure "resulted into a reversal of the relationship between biosphere and techno-topes, ending up in the emergence of the 'technosphere' as now encompassing the biosphere"); Hoffman & Jennings, *supra* note 9, at 11.

> Rather than fitting environmental considerations into social systems, it is . . . social systems [that] are intruding on natural systems to the point that natural planetary systems may be seen as partly nested under the social ones . . . . We now have control over the biosphere and therefore, the human systems which depend on it, in ways that are monumental.

*Id.*

38. Steffen et al., *supra* note 4, at 614; *see also* Mark J. Hudson, *Placing Asia in the Anthropocene: Histories, Vulnerabilities, Responses*, 73 J. ASIAN STUD. 941, 941 (2014) (quoting Johan Rockström et al., *A Safe Operating Space for Humanity*, 461 NATURE 472

of the anthropogenic causes of Anthropocenic change during the most-recent Great-Acceleration stage have been summarized as follows:

> The human enterprise suddenly accelerated after the end of the Second World War. Population doubled in just 50 years, to over 6 billion by the end of the 20th century, but the global economy increased by more than 15-fold. Petroleum consumption has grown by a factor of 3.5 since 1960, and the number of motor vehicles increased dramatically from about 40 million at the end of the War to nearly 700 million by 1996. From 1950 to 2000 the percentage of the world's population living in urban areas grew from 30 to 50% and continues to grow strongly. The interconnectedness of cultures is increasing rapidly with the explosion in electronic communication, international travel and the globalization of economies.
>
> The pressure on the global environment from this burgeoning human enterprise is intensifying sharply. Over the past 50 years, humans have changed the world's ecosystems more rapidly and extensively than in any other comparable period in human history. The Earth is in its sixth great extinction event, with rates of species loss growing rapidly for both terrestrial and marine ecosystems. The atmospheric concentrations of several important greenhouse gases have increased substantially, and the Earth is warming rapidly. More nitrogen is now converted from the atmosphere into reactive forms by fertilizer production and fossil fuel combustion than by all of the natural processes in terrestrial ecosystems put together.[39]

## B. *The Anthropocene's Disruption*

"Anthropocenic Disruption,"[40] as conceived in this Foreword, has both *natural*-capital and *social*-capital dimensions.[41] In this sense, it is

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(2009)) ("[H]uman impact on the environment has resulted in changes that are dangerously eroding the basic life support systems for humans and for many other species, exceeding . . . the 'safe operating limits for humanity.'").

39. Steffen et al., *supra* note 4, at 617 (internal references omitted). *See generally* Erle C. Ellis, *Anthropogenic Transformation of the Terrestrial Biosphere*, 369 PHIL. TRANSACTIONS ROYAL SOC'Y A 1010 (2011) (analyzing the transformation of much of the terrestrial biosphere as part of Anthropocenic change); Will Steffen et al., *The Anthropocene: Conceptual and Historical Perspectives*, 369 PHIL. TRANSACTIONS ROYAL SOC'Y A 842 (2011) (examining the rapidly evolving and accelerating trends in many global environmental indicators of Anthropocenic change); Toby Tyrrell, *Anthropogenic Modification of the Oceans*, 369 PHIL. TRANSACTIONS ROYAL SOC'Y A 887 (2011) (discussing Anthropocenic change occurring in the Earth's maritime systems).

40. Similarly, the "Great Disruption" or the "disruption to end all (fossil-fueled technological and financial-engineering) disruptions."

41. *See* Steffen et al., *supra* note 4, at 615.

triggered by modern human activity in a dual, interdependent manner.[42] While "human activities are indeed affecting the structure and functioning of the Earth System as a whole,"[43] it is the Earth System—from which all human activities necessarily derive—that has now begun to systemically affect the structures and functioning of modern human activity. But to make matters worse (and much more immediately so), the same human activities that affect the Earth's natural capital also negatively affect humanity's own social capital—and at similar global and systemic "erosions of scale."

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> We use the term *global change* to mean both the biophysical and the socioeconomic changes that are altering the structure and the functioning of the Earth System. Global change includes alterations in a wide range of global-scale phenomena: land use and land cover, urbanisation, globalisation, coastal ecosystems, atmospheric composition, riverine flow, nitrogen cycle, carbon cycle, physical climate, marine food chains, biological diversity, population, economy, resource use, energy, transport, communication, and so on. Interactions and linkages between the various changes listed above are also part of global change and are just as important as the individual changes themselves. Many components of global change do not occur in linear fashion but rather show strong nonlinearities.

*Id.*

42. *Cf.* Rowan, *supra* note 10, at 448–49 ("[T]he Anthropocene . . . allows the distinction between the social and the natural, the human and the inhuman to be muddied by way of [the] mutually-constitutive intrusions [of social relations]."). *But see* Yadvinder Malhi, *The Concept of the Anthropocene*, 42 ANN. REV. ENV'T & RESOURCES 77, 83, 97 (2017) (discussing "Anthropocene disruption" merely in terms of "disrupting many aspects of planetary functions"); Marcello Di Paola & Dale Jamieson, *Climate Change and the Challenges to Democracy*, 72 U. MIAMI L. REV. 369, 419 (2018) (limiting the term "Anthropocene disruption" to the natural-capital disruption of the "earth's fundamental ecological systems, including those that govern climate").

43. Steffen et al., *supra* note 4, at 618.

In the natural-capital[44] dimension, modernity has been financed against a largely stable and plentiful Holocene biosphere[45] which, to date, has put up limited-to-no "resistance" to human resource extraction and resource destruction and, instead, has even "patiently" and "unwaveringly" afforded "a certain kind of irreplaceable capital asset, namely, the *tolerance margins* which benign nature always provides."[46] Now, with tolerance margins rapidly depleting, the overall natural capital of the Earth's biophysical system is in fast-track spending mode while, simultaneously, ecosystem costs are sky-rocketing.[47] Thus, diminishing natural capital, coupled with (still) mostly invisibly accelerating natural debt, is the first systemic challenge and "tipping domino" to a very different future of the future—or "future-future."[48] A spent-down, bankrupted planet cannot carry much, if any, life.

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44. *See generally* SMALL IS BEAUTIFUL, *supra* note 24, 5–8 (discussing natural capital).

> Schumacher defined natural capital both narrowly and amorphously: fossil fuels and the tolerance margins of nature and human subsistence. Today we understand natural capital as the sum total of renewable and non-renewable resources, including the ecological systems and services that support life. It is different from conventionally defined capital in that natural capital cannot be produced by human activity. What was unimaginable 25 years ago was the speed with which the loss of natural capital would affect humankind.

HAWKEN, *supra* note 3, at 5. For critical accounts of assigning standard neoclassical economic frameworks and terminology, as in natural "capital," to ecological systems, see, for example, Mark S. Goldberg & Geoffrey Garver, *Measurement of Essential Indicators in Ecological Economics*, *in* ECOLOGICAL ECONOMICS FOR THE ANTHROPOCENE: AN EMERGING PARADIGM 125, 130–35 (Peter G. Brown & Peter Timmerman eds., 2016) (pointing out the "incommensurability" and "absurdity of . . . any . . . monetized valuation of ecosystems or species"); *see also* PETER G. BROWN, ETHICS FOR ECONOMICS IN THE ANTHROPOCENE 18 (Kathleen Duffy et al., eds., 2012).

> We cannot rise to the challenge set out by ecological economics by simply extending vocabulary from the worldview we are trying to overturn, as for instance in the concepts of natural capital and ecosystem services. A rethink is required of the language, structures, practices, and guiding principles that inform our current system.

*Id.*

45. *See* Hudson, *supra* note 38, at 942.

46. SMALL IS BEAUTIFUL, *supra* note 24, at 8.

47. *Cf.* Crispin Tickell, *Societal Responses to the Anthropocene*, 369 PHIL. TRANSACTIONS ROYAL SOC'Y A 926, 927 (2011).

48. The "future-future" is the span of future time that only commences beyond the average (or individually-prognosticated) life expectancy of the person who thinks, forms expectations, and makes predictions about the future. Unlike the future, which the thinker expects to experience personally, the future-future is technically beyond the realm of expectations given that the thinker does not have to orient current decision-making for personal survival and prosperity vis-à-vis uncertain future outcomes that clearly go beyond her expected length of existence. Accordingly, thinking about the future-future can only be an intellectual exercise. Such exercise, however, is severely limited by a special form of bounded rationality, namely,

In the dimension of social capital, representing "the informal cooperative infrastructure of our societies,"[49] we have financed modernity against social mores, norms, customs, traditions and institutions that were built and transferred by human forebears from generation to generation "on the order of centuries or millennia."[50] Now, this massive store of accumulated and inherited social capital—constituting the very "bracings" that embed[51] human cooperation in modern societies which, as public-good "privileges," have been produced, maintained, and replenished, often at highest cost,[52] by generation after generation of human ancestors for the free, "taken as given,"[53] "plundering"[54] consumption by today's modern hominid population—this store is also starting to run empty. The enlightenment's assault on the collective—raising the individual and her rights and entitlements above everyone and everything else—is almost complete[55] due to, in large part, the mass-

humans' limited ability to appreciate system complexity and system interdependency in thinking about the future from a vantage point outside of the predictive system (similar to the limitations of visualizing and conceptualizing the Milky Way galaxy from its outside rather than from the midst of it while necessarily located on planet Earth or, at least, within the Earth's solar system). *Cf.* Hoffman & Jennings, *supra* note 9, at 12 ("[U]nlike in the Enlightenment, which celebrated the use of personal observation to make sense of the world, a person cannot really learn about the Anthropocene through such direct experience.").

49. Ernst Fehr & Simon Gächter, *Fairness and Retaliation: The Economics of Reciprocity*, 14 J. ECON. PERSP. 159, 167 (2000); *see also* Morten Hansen & Kate Roll, *Social Capital and Adoption of Agronomic Practices* 6 (Univ. of Oxford, Saïd Bus. Sch., Mutuality in Bus. Working Paper No. 2, 2016) (defining social capital as "productive social bonds and community norms"). It should be noted that, as used in this Foreword, the meaning and function of social capital is not limited to improving economic outcomes but, as all capital used in human cooperation (financial, social, natural, cultural, reputational, "human," etc.), to improving all aspects of socioeconomic and overall social welfare in terms of both personal and collective outcomes, including their respective accumulations, costs and distributions.

50. Oliver E. Williamson, *The New Institutional Economics: Taking Stock, Looking Ahead*, 38 J. ECON. LITERATURE 595, 596 (2000). "Be that as it may, the resulting institutions [on the social embeddedness level] have a lasting grip on the way a society conducts itself." *Id.* at 597; *see also* Gerd Gigerenzer & Ulrich Hoffrage, *How to Improve Bayesian Reasoning Without Instruction: Frequency Formats*, 102 PSYCHOL. REV. 684, 686 (1995) ("[P]robabilities and percentages took millennia of literacy and numeracy to evolve; organisms did not acquire information in terms of probabilities and percentages until very recently.").

51. *See* Mark Granovetter, *Economic Action and Social Structure: The Problem of Embeddedness*, 91 AM. J. SOC. 481, 481–83 (1985).

52. Including two world wars.

53. Williamson, *supra* note 50, at 596.

54. *See* Crutzen & Stoermer, *supra* note 19, at 18.

55. *Cf.* Hoffman & Jennings, *supra* note 9, at 21 ("Ironically, it was the Enlightenment that, following the work of Adam Smith, created the concept of the market. This concept and structure has served as the fundamental organizing principle of the neoliberal market for goods and services that encroaches on planetary boundaries today.").

consumptive and mass-communicative allure of modern (social) media and technology, and virtually constant technology-modulated human pseudo-interaction. Similar to a former open-system planet, a former open-system societal fabric, now characterized by progressive, irreversible social-capital deterioration and erosion, cannot continue to constantly feed on itself and still support human cooperative activity indefinitely.

Thus, while it is certainly the case that "[t]he biological and chemical signals left by humans—invisible, intangible in our day-to-day lives—may leave a [problem] more profound than the physical structures of the world's megacities,"[56] the more immediate problem—and second systemic challenge and "tipping domino" to the world as we know it—is evaporating social capital coupled with stealthily accelerating social debt. Social-capital erosion would seem an equally essential inquiry as to the very attainability of a future-future for the human race in an Anthropocene era. Surprisingly, however, it constitutes a gravely neglected inquiry[57] for purposes of explaining, evaluating, and predicting Anthropocenic change. When hundreds of millions of (additional) people worldwide are, *inter alia*, malnourished, without access to potable water, and displaced from

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56. *A New Epoch*, *supra* note 26, at 837.

57. *See, e.g.*, Frans Berkhout, *Anthropocene Futures*, 1 ANTHROPOCENE REV. 154, 154 (2014) ("[T]here is a need for a greater focus on Anthropocene Futures that are relevant to societal actors now and in the relatively near-term future."); Hoffman & Jennings, *supra* note 9, at 17 ("[I]t is evident that both constructs—Anthropocene Era and Anthropocene Society—are fundamentally under-developed."); Palsson et al., *supra* note 15, at 7 ("[I]t is remarkable how little . . . concepts [like the Great Acceleration] tell us about the process, the driving forces, and the social consequences of the changes they imply."). "[T]he social and political change that is needed for [Anthropocenic] sustainability is poorly understood." *Id.* at 9. To provide a concrete example in this regard: so-called "tipping elements" have been introduced in climate-change research and

> described as abrupt or irreversible changes in the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report[; they constitute] . . . elements (i.e., subsystems) within the earth's climate system that could pass critical thresholds, resulting in the destabilization, destruction, critical damage, or transmutation of the major subsystems of the climate system.

Yoshihiko Iseri et al., *Towards the Incorporation of Tipping Elements in Global Climate Risk Management: Probability and Potential Impacts of Passing a Threshold*, 13 SUSTAINABILITY SCI. 315, 315 (2018) (citations omitted). No such tipping elements (or similar concepts) appear to be systematically investigated, modelled, or otherwise discussed in the social-capital deterioration realm of the Anthropocene. *Cf.* Gillings & Hagan-Lawson, *supra* note 7, at 8 ("The planetary boundaries central to the Anthropocene concept imply social tipping points that accompany the planetary tipping points . . . ."); Herrmann-Pillath, *supra* note 29, at 2 ("What is needed is a science of the technosphere, part and parcel of the sciences of the Anthropocene. This cannot be only based on the sciences and engineering disciplines, but requires close cross-disciplinary integration, especially with the social sciences.").

their former habitats of (relative and numbing) comfort by the forces of nature,[58] no social norms, mores, customs, traditions, or institutions will have any bearing or constraint on their single-minded quest for survival and, at least, some temporary modicum of residual creature comforts (nutrition, shelter, other basic protections from "the elements," etc.).[59] Whatever social capital may then have survived, it will quickly turn brittle under these circumstances and conditions and yield to an Anthropocenic *bellum omnium contra omnes*.

### C. *Anthropocenic Vulnerability & "Early Twenty-First-Century Ostrich Syndrome"*

"In the face of th[e] relentless loss of living systems [and natural capital], fractious political conflicts over laws, regulations, and business economics [may] appear petty and small"[60]—but only when opportunely discounting Anthropocenic social-capital loss and assuming sociopolitical functionality levels still available in today's modern civilizations. Once those fractious conflicts reach post-political dimensions—that is, when they can no longer be (sufficiently) dealt with by re-incrementally achieving large-scale compromise of disparate and ultra-competitive factional interests through representation-legitimatized political systems of public governance—they are guaranteed to no longer appear petty and

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58. *See* Eric Biber, *Law in the Anthropocene Epoch*, 106 GEO. L.J. 1, 20 (2017).

> Displacement of tens or hundreds of millions of people as a result of climate change . . . will deprive those people of access to food, clean water, security, and health services. That deprivation, in turn, will increase the risk of disease and food insecurity, creating a vicious cycle that will further increase the human harms from climate change.

*Id.* (footnotes omitted).

> Do we think that the risk of political and legal disruption will be lower or higher if we wait until millions of climate refugees are fleeing sea level rise, if droughts and changes to precipitation and water storage systems are causing dramatic impacts on agricultural systems, and if our economic and physical infrastructure is under severe stress?

*Id.* at 67.

59. In the U.S., for example, many of these people will also be heavily armed. *See, e.g.*, AARON KARP, SMALL ARMS SURVEY, ESTIMATING GLOBAL CIVILIAN-HELD FIREARMS NUMBERS 4 (2018), http://www.smallarmssurvey.org/fileadmin/docs/T-Briefing-Papers/SAS-BP-Civilian-Firearms-Numbers.pdf [https://perma.cc/T3TG-XXBJ] (estimating a rate of civilian-held legal and illicit firearms in the U.S. in 2017 of 120.5 firearms per 100 residents—the highest per-capita rate in the world—followed by Yemen with the second-highest estimated rate of only 52.8 firearms per 100 residents).

60. HAWKEN, *supra* note 3.

small.[61] There will be nothing but post-political, even "post-societal" conflict; natural-capital preservation will be completely irrelevant to then-remaining human activity; and *après moi, le déluge* will remain the only common-denominator, survivalist behavioral mindset.

Unfortunately, this is no longer a distant dystopian scenario. Current generations of (law) students, during their own lifetimes, will encounter systemic, massive-scale and unprecedented disruption to the sociopolitical, socioeconomic, and sociolegal equilibrium that, on average, first-world humans still enjoy and take for granted today.[62] The Anthropocenic catastrophe will be real. It is already nascent today. And it is unavoidable under *all* circumstances—that is, it will occur irrespective of all human mitigation activity in both the present and the future. And, finally, it will disrupt the social-capital ordering of human societies *way before* the Anthropocene's natural-capital disruption will reach full swing. Anthropocenic disruption has long started and certain "tipping elements"[63] have already been established in this regard—they are *the* present, not *a* future reality, even if their full effect will only materialize later in the twenty-first and twenty-second centuries. Anthropogenic sea-level rise serves as an already well-researched example in this regard—an example that is "here," in both time and space, and that under no circumstances will ever "go away," or may simply be ignored.

When people think of Cambridge, Massachusetts, many will think of Harvard University and the Massachusetts Institute of Technology (MIT). Very few will think of climate change and that Cambridge, Massachusetts is highly vulnerable to climate-change-induced sea-level rise. According to a study published in the *Proceedings of the U.S. National Academy of Sciences* (PNAS) in 2015,[64] the then-already locked-in sea-level rise[65]—based entirely on historical, pre-2016 anthropogenic greenhouse-gas emissions—meant that land area in Cambridge which was home to at least

61. *Cf.* Palsson et al., *supra* note 15, at 8 ("This is a grave underestimation of the problem. Our suggestion is that . . . we should draw on the growing work in all fields of science that suggests the fundamentally disruptive and discontinuous character of our current phase of societal and planetary development.").

62. *Cf.* Hoffman & Jennings, *supra* note 9, at 12 ("A response to the Anthropocene Era calls for a new and as yet undefined social order called 'Anthropocene Society,' which would transform many preexisting beliefs within multiple segments of society.").

63. *See* Iseri et al., *supra* note 57, at 315–16.

64. *See Carbon Choices*, *supra* note 1.

65. The term "locked-in" here means that such long-term sea-level rise has not yet happened, but that it is projected to inevitably do so in the future. *See id.* at 13509.

twenty-five percent of its 2010 census-data population was already committed[66] in 2015 to fall below the future high-tide line.[67] Unfortunately for Cambridge, this was only the study's "baseline"-case[68] modelling scenario which made no assumptions as to the collapse of the West Antarctic Ice Sheet (WAIS). Recent climate research is finding "evidence that some degree of irreversible loss from the WAIS may have begun."[69] Thus, according to the study's "triggered" case,[70] which assumes WAIS collapse, resultant long-term sea-level rise will have catastrophic effects on coastal communities, including many of the largest metropolitan areas worldwide, among them, Boston and its immediate neighbor, Cambridge, Massachusetts. Without the expensive, coordination-intensive, and time-consuming construction of massive-scale sea defenses[71] against the Atlantic Ocean, land area in Cambridge inhabited by *at least half* of its 2010-census population was already committed in 2015 to become *permanently* submerged at some point in the future, arguably, within the next century, under the WAIS-collapse scenario.[72]

Permanent inundation, however, is not the only inundation problem caused by rising sea levels. By the time permanent inundation becomes reality, affected land will long have ceased to be inhabitable because of

66. Likewise, livable land area is "committed" when it is no longer avoidable for that particular land area to not fall below the high tide line—even if adaptive measures to reduce greenhouse gas emissions were taken post-2015, and even if such adaptive measures would reduce post-2015 greenhouse gas emissions completely to zero. *Id.* at 13508–09.

67. Benjamin H. Strauss et al., *Carbon Choices Determine US Cities Committed to Futures Below Sea Level: Supporting Information*, PROC. NAT'L ACAD. SCI., at 4 tbl.S3, https://www.pnas.org/content/pnas/suppl/2015/10/08/1511186112.DCSupplemental/pnas.201511186SI.pdf?targetid=nameddest%3DST1 [https://perma.cc/FNW5-T5HZ] [hereinafter *Carbon Choices Supporting Information*]; *cf.* Gillings & Hagan-Lawson, *supra* note 7, at 8 ("The time lag between cause and effect for complex earth systems mean[s] that likely effects are already mortgaged into the future, and preventing the causes now will not stop the changes that are already in train.").

68. *Carbon Choices*, *supra* note 1.

69. Peter Good et al., *Recent Progress in Understanding Climate Thresholds: Ice Sheets, the Atlantic Meridional Overturning Circulation, Tropical Forests and Responses to Ocean Acidification*, 42 PROGRESS PHYSICAL GEOGRAPHY 24, 32 (2018); *see also* Eric Rignot et al., *Four Decades of Antarctic Ice Sheet Mass Balance From 1979–2017*, 116 PROC. NAT'L ACAD. SCI. 1095, 1102 (2019) ("In sum, the northern sector of West Antarctica is losing mass rapidly and could entrain the progressive collapse of a large share of West Antarctica and its 5.1-[meter sea-level equivalent].").

70. *Carbon Choices*, *supra* note 1.

71. *See, e.g.*, Jochen Hinkel et al., *Coastal Flood Damage and Adaptation Costs Under 21st Century Sea-Level Rise*, 111 PROC. NAT'L ACAD. SCI. 3292 (2014).

72. *Carbon Choices Supporting Information*, *supra* note 67, at 6 tbl.S5.

"*effective* inundation—defined as having 10% or more of livable land area flooded at least 26 times per year" as a result of "tidal flooding—coastal flooding that is driven in large part by routine tidal fluctuations rather than precipitation or storm surge."[73] At current levels and estimates, growing portions of livable land area in Cambridge, Massachusetts are already on track to becoming effectively inundated—that is, on average, to experiencing *bi-weekly* tidal flooding—as early as 2060.[74] Cambridge is also vulnerable to periodic coastal storm-surge flooding when "[l]arge storms, such as hurricanes, . . . produce . . . higher than normal amounts of water generated and [being] pushed inland."[75] While "Cambridge is connected to Boston Harbor and the ocean by the Charles River and the Alewife Brook, a tributary to the Mystic River, the Charles River Dam and the Amelia Earhart Dam (on the Mystic River) have been able to block surges from coming up rivers."[76] Unfortunately, these dams are not protecting Cambridge from storm-surge flooding for much longer. "It is projected that the Amelia Earhart Dam will likely be bypassed around 2045 and the Charles River Dam around 2055."[77] These storm-surge flooding, effective flooding, and permanent flooding scenarios are not theoretical scenarios of *what if*—they are future projections of *when*. They pose very practical, very real questions of how much time is left and how quickly Cambridge must prepare. In other words, Harvard and MIT should plan now—comprehensively and as a *first and foremost* institutional priority—to either relocate completely to higher ground and properly decommission and leave behind all of their respective current "permanent" infrastructures, or to find feasible, fail-safe ways to flood-proof themselves, Cambridge, and the larger Boston area against

73. Dahl et al., *supra* note 6, at 1 (emphasis added).

74. *Id.* When "[m]apping the extent of effective inundation within the 23 coastal states of the continental US at a series of time steps between now and 2100 using tide gauge-specific sea level rise projections based on three global sea level rise scenarios published for the Third US National Climate Assessment (NCA hereafter)," *id.* at 3, livable land area in Cambridge, Massachusetts will encounter effective inundation (under either NCA's highest sea-level scenario (NCAH) or NCA's intermediate-high sea-level scenario (NCAI)) by the following percentages: 2060 (NCAH)—10.1%; 2070 (NCAH)—35.8%; 2080 (NCAH)—42%; 2080 (NCAI)—10.2%; 2090 (NCAH)—46.7%; 2100 (NCAH)—50.3%; 2100 (NCAI)—39.3%. *Id.* at 17 tbl.S3 (providing a supplemental table of the percentage of inundation within communities for all years and scenarios).

75. CITY OF CAMBRIDGE, MASS., CLIMATE CHANGE VULNERABILITY ASSESSMENT REPORT-PART 2 4 (2017), https://www.cambridgema.gov/CDD/Projects/Climate/~/media/F93208C3B12D4AACBD3E0F3A712F68C7.ashx [https://perma.cc/EFX8-2L74].

76. *Id.*

77. *Id.* at 5.

catastrophic *storm-surge*, then *effective*, then finally *permanent* inundation.

Lastly and again, unfortunately, Cambridge is in a lot of "not-so-good" company. According to the PNAS study discussed earlier, land area inhabited by close to twenty million people in U.S. coastal states (based on 2010 U.S. census population data) was already committed in 2015 to become permanently inundated under the WAIS-collapse modelling scenario.[78] Similarly, based on the NCA's intermediate-high and highest sea-level rise scenarios,[79] "489 and 668 communities [within the twenty-three coastal states of the continental United States], respectively, would face effective inundation by the year 2100."[80] Left unabated, that is, without the relatively swift construction of efficient sea defenses along large parts of the U.S. coastlines, people in all of these coastal communities will be forcefully displaced. They will lose their land and their homes; their property values will evaporate into thin air; and they will have to hunt for new permanent shelter and home. In addition, and probably more vexing in terms of overall "decommission costs" and "relocation costs," all major infrastructure in these coastal communities (e.g., all transportation infrastructure, warehouses, factories, industrial complexes, power plants, refineries, electrical and telecommunication grids, waste management systems, underground storage facilities, etc.) will have to be safely and securely built back, demolished, and its sites cleaned up. Furthermore, large-scale and completely unprecedented human migration away from oceanic and riparian shorelines to more scarce higher ground will have to be organized, and replacement settlements and support infrastructure will have to be found,[81] often requiring new construction or large-scale adaptation of existing

78. Including a minimum of twenty-five percent of inhabited land in large cities like Boston, Honolulu, and Long Beach; a minimum of fifty percent in cities like Miami, St. Petersburg, and Virginia Beach; and all one hundred percent of residential land in New Orleans and Hialeah. *Carbon Choices Supporting Information*, *supra* note 67, at 6–7 tbls.S5 & S6.

79. *See* Dahl et al., *supra* note 6, at 1, 17 tbl.S3.

80. *Id.* at 1.

81. *See, e.g.*, Geisler & Currens, *supra* note 6, at 322–23 (discussing coastal out-migrations and barriers to entry in noncoastal hinterlands); Hauer, *supra* note 6 (modelling the potential impacts in landlocked communities created by sea-level rise induced displacement); Robinson, *supra* note 34, at 16–17 ("No government . . . has enough money or personnel to restore communities disrupted by climate change events to their condition before the tragedy. It will not be possible to 'rebuild everywhere' to restore what was. The seas will reclaim coastal sites, and funds will be needed to resettle people inland . . . .").

infrastructure within acute and non-repeat "time scales beyond past experience."[82]

Accordingly, the central argument in terms of Anthropocenic disruption is that—long before, for example, anthropogenic sea-level rise will have fully materialized later in the twenty-first and twenty-second centuries—the original onslaught of disruption will systemically challenge the tangible and intangible social structures, social institutions, social habitats, and the very sociotopes of modern human civilization.[83] And it will do so globally and much sooner than expected, that is, over only a few next decades. In other words, the "tipping dominos" of Anthropocenic natural-capital disruption (for example, permanent sea-water inundation) are not only falling forward in time—that is, they only topple over as and when they will actually materialize, thus, affecting only their subsequent future and future-future. They also, *first and foremost*, already fall backward in time—that is, they already topple over and onto present societies, thus, way before they will actually materialize in the future. Accordingly, they are already affecting today's social systems and are triggering an unprecedented (and still largely unnoticed) accelerating cascade of Anthropocenic social-capital disruption.[84] Consequently, the

82. Gillings & Hagan-Lawson, *supra* note 7, at 7; *cf.* Palsson et al., *supra* note 15, at 3 ("There is growing recognition that humans are faced with a critical and narrowing window of opportunity to halt or reverse some of the key indicators involved in the environmental crisis.").

83. *See* Gillings & Hagan-Lawson, *supra* note 7, at 8 (mentioning, though only in passing, potential civilizational collapse); *cf.* Hoffman & Jennings, *supra* note 9, at 19 ("[O]ne challenge for the study of the Anthropocene Era is that no single event will create a disruption to a new institutional order.").

84. For example, Anthropocenic disruption is already causing new forms of socioeconomic vulnerability in coastal communities today, known as "climate gentrification." *See* Keenan et al., *supra* note 6. In this regard, Anthropocenic disruption has already had a measurable effect on real-estate valuations. *See, e.g.*, McAlpine & Porter, *supra* note 6. Accordingly, there will be two displacement waves in coastal communities: the first in time is *anticipatory* of future sea-level rise and storm-surge, effective and permanent flooding, and it is already occurring now (as *socioeconomic* displacement of lower-income people in higher-altitude coastal areas). The second in time will be *actual* as a result of occurring storm-surge and effective flooding in the future (as *biophysical* displacement of (remaining) people in lower-altitude coastal areas; note that actual, biophysical displacement will not wait until *permanent* flooding). Actual displacement already causes direct, primary Anthropocenic vulnerability (for example, on higher-income people in lower-altitude coastal areas). Anticipatory displacement already causes collateral, secondary Anthropocenic vulnerability (for example, on lower-income people in higher-altitude coastal areas). Thus, as part of climate gentrification, today's people with primary Anthropocenic vulnerability but more socioeconomic "wherewithal" are already financing their private Anthropocenic resilience by anticipatorily displacing (thus, increasing the secondary Anthropocenic vulnerability of) people with less socioeconomic "clout" and "resilience capital." Collateral, secondary Anthropocenic vulnerability is often systemic for affected populations and, in terms of both its earlier timing and its social-capital

more immediate and disruptive character of what may be termed "Anthropocenic vulnerability" is its constituent social vulnerability (not its more protracted, though significantly larger, ecological-vulnerability component)[85]—namely, an accelerating social-capital susceptibility and defenselessness to the coming "hyper-inflation" of sociopolitical stability and to the "devaluation" and erosion of social norms, mores, customs, traditions, and institutions in the wake of everyday Anthropocenic disruptive chaos and system-wide failure. Whereas the natural-capital dimension of Anthropocenic disruption will bring unprecedented natural-system destabilization and disequilibrium, including (and discussed most prominently today) climate-system destabilization, the social-capital realm of Anthropocenic disruption will witness a profound social-system destabilization and disequilibrium, including (though rarely discussed today) an institutional, macro-system destabilization,[86] that—as is posited and predicted here—will also force humankind to drastically "rightsize" socioeconomic cooperation and to radically de-grow and decarbonize modern production and consumption systems. Today's modern socioeconomic systems are aggressively corporatized, financialized, and globalized. They are *deemed* too big to fail. In reality, particularly under Anthropocenic disruptive conditions, they are wholistically insupportable, inevitably prone to systemic failure, and thus, too big to *not* fail.

disruption, more important to address immediately. However, it is also harder to notice and, therefore, is much more neglected in terms of resilience planning and resilience governance. *See generally* J. Julius Graefe, Climate Justice: An Assessment of Gentrification and the Disparate Displacement of Marginalized Groups in U.S. Coastal Communities (2018) (unpublished manuscript) (on file with the Western New England Law Review) (discussing the displacement of residents in American coastal communities through climate gentrification, and offering climate justice solutions to protect local residents against climate gentrification and displacement).

85. *See generally* Angela P. Harris, *Vulnerability and Power in the Age of the Anthropocene*, 6 WASH. & LEE J. ENERGY CLIMATE & ENV'T 98, 109–27 (2014) (developing a theory of ecological vulnerability premised on Martha Fineman's vulnerability paradigm).

86. *See* Jorge E. Viñuales, *Law and the Anthropocene* 48 (Cambridge Ctr. for Env't, Energy and Nat. Res. Governance, Working Paper No. 2016-5, 2016) ("[T]he institutional changes that will need to be phased-in and those that will be phased-out are of gargantuan dimensions."); *cf.* Hoffman & Jennings, *supra* note 9, at 15 ("In a world with increasing periods of scarcity and calamity, . . . institutional systems might break down or fragment.").

## II. COMMUNITY RESILIENCE

> *"The need for long-term planning . . . is hard to overestimate, but democratic systems offer few incentives to cultivate expectations of a future of scarcity and sacrifice."*[87]
>
> *–Shane Mulligan*

The only "right size" of human cooperation and cooperative organization in the face of Anthropocenic disruption that first-world, modern humans still have residual experience with is *community*.[88] A "New" or "Second Renaissance," as a concerted social-capital response to Anthropocenic disruption, will necessitate severely-downscaling institutional and social-system changes and, as is argued here, a corresponding rediscovery of the middle, communal realm in all of its organizational and normative dimensions.[89] Consequently, putting one's head in the sand in order to wait out one's remaining lifetime and to protect one's ignorance, or merely deciding to react to, and massage the margins of, the Anthropocene's disruptive impact as and when it materializes later in plain, unignorable sight, or otherwise subscribing to the neoliberal business-as-usual complacency approach as a coping strategy[90] due to either rational inertia or even stronger denialist proclivities, are all not responsible or even viable options remaining to humanity today.[91] Our[92] world will not become a better place by insisting

87. Mulligan, *supra* note 5, at 92.

88. "Community" is used herein in a functional and organizational sense, thus, as the meso-realm of human cooperation in-between micro-levels (relational/group) and macro-levels (institutional/social). Therefore, it is not limited to only spatial forms of meso-organization (for example, the so-called "local communities" we live in) but includes all forms of *cooperative* community.

89. *Cf.* Hoffman & Jennings, *supra* note 9, at 18 ("How will society resist or transition to a new set of social values in Anthropocene Society . . . ?").

90. *See, e.g.*, Steffen et al., *supra* note 4 ("[Among] three broad philosophical approaches . . . in the growing debate about dealing with the changing global environment[,] . . . . [t]he business-as-usual approach appears, on the surface, to be a safe and conservative way forward."); Christopher Wright et al., Editorial Introduction, *Organizing in the Anthropocene*, 25 ORG. 455, 459–60 (2018) ("[I]n corporate boardrooms, political offices and mainstream media there is little if any acknowledgement of the huge ecological transformations humanity and other species face due in large part to the 'business as usual' trajectory.").

91. *Cf.* Shalanda H. Baker, *Adaptive Law in the Anthropocene*, 90 CHI.-KENT L. REV. 563, 564 (2015) ("[R]eliance on neoliberal economic development institutions and methodologies to engage in the climate change adaptation project will render states in the Global South even more vulnerable and less resilient in the face of climate change.").

92. After diagnosing the Anthropocenic disruptive dilemma for humankind in somewhat detached, third-person terms in Part I, the remaining discussion of action in the face of

that others do a better job or that we somehow magically put better governments and more responsible corporations in place in order to take care of things. Such a purely reflexive and placative approach is exactly how we, individually and collectively, make our social-capital world worse every day. We are all dependent on public goods, we are always willing to declare our support of the common welfare, but then we condition such support, in actual deeds, not merely words, routinely on everyone else pulling their respective weight—thus, opportunistically and self-deceptively pacifying our conscience by trusting an elusive "infallibility of the alchemy by which the pursuit of private ends is transmuted into the attainment of public good."[93] As a result of such "reciprocity of hesitation" and "mutuality of inaction," we are all freeriding and conveniently rationalizing why we should pull less because others are not pulling as hard as we think they should. Social entrenchment, stifling communal innovation and suppressing justice in our collective realms, inevitably ensues—with no top-down hierarchy-centered or bottom-up contracting-based solution available to break this persistent, noxious default mode.

### A. *The Absence of Resilience in the Absence of Community*

Resilience is both an inversion and a consequence of vulnerability.[94] All systems—whether open or closed, natural or social—are vulnerable at all times.[95] The Earth system[96] is vulnerable, *inter alia*, to anthropogenic natural-resource destruction and resultant climate change. Humanity is vulnerable, *inter alia*, because it is rapidly losing both the natural and social bracings that sustain modern human civilization. Particularly,

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Anthropocenic social-capital deterioration is quintessentially personal. Accordingly, changing similarly to first-person plural forms appears appropriate, if not, necessary.

93. TAWNEY, *supra* note 13, at 14–15.

94. *See, e.g.*, C.S. Holling, *Resilience and Stability of Ecological Systems*, 4 ANN. REV. ECOLOGY & SYSTEMATICS 1, 17 (1973).

> Resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist. In this definition resilience is the property of the system and persistence or probability of extinction is the result.

*Id.*

95. For a detailed discussion of the potential pitfalls of resilience planning, aimed at minimizing climate disruption at the community level, and of the vulnerabilities *created* by such resilience planning because of the general neglect of pervasive ecosystem service trade-offs analyses, see Keith H. Hirokawa & David Dickinson, *The Costs of Climate Disruption in the Trade-Offs of Community Resilience*, 41 W. NEW ENG. L. REV. 455 (2019).

96. For a definition of "Earth system," see Steffen et al., *supra* note 4, at 615.

modern human *community* is largely non-resilient to non-existent.[97] Modern first-world societies are designed and built to separate and isolate their human constituents from each other. In terms of day-to-day activity, humans share virtually nothing with others on a genuine communal level. The moment reliable access[98] (i.e., far from *all* access) to, *inter alia*, readily-available electricity, gasoline, heating, and cooling sources is removed from modern urban, suburban, and exurban lifestyles, the illusion of community (if not, of society) quickly collapses, and the communal vacuity of all modern mass-communicative, mass-consumptive, and mass-migratory human activity is fully exposed. Modern humans live disconnected, lonely lives in constant transition—isolated from nature, from (most) family, from neighbors, even from themselves. Their being *among* (rather than *with*) others happens[99] mostly when there is either a commonality of productive purpose (mainly, income-generating work), a parallelity of consumptive purpose (for example, eating out in restaurants or attending entertainment events), or an accidentally-conjoining transition from one to the other of such purposes (for example, while generating road traffic or riding on public transportation). Neither purpose creates communality but only temporarily and spatially relieves atomistic separation and isolation. Either purpose is also premised on economic exchange and, thus, has a built-in, bargained-for utility that dictates both the individual activity and, worse, the resultant relationship(s) of labor division and commercial reciprocity. Accordingly, resultant relationships of being among others (or in the mere presence of others) are inescapably "stunted" by consumptive personal-utility maximization and, thus, can never transmute into, or otherwise become part of, genuine community.[100] On average, post-postmodern civilizations evidence the wrong housing patterns, transportation systems, food and water supplies, as well as energy infrastructures in order to muster sufficient amounts of resilience, communal or otherwise, so as to confidently face Anthropocenic

97. *See* Herrmann-Pillath, *supra* note 29, at 1 (stating that because of the growth of the human network of interactions over time, "independent human communities became extremely rare").

98. Of course, "access," in terms of passive receipt of energy as an instant consumption good, conceals the absurd amounts of capital investment, labor and regulation necessary for purposes of coordinating the complex active endeavors involved in the long-distance production, distribution, and delivery of energy.

99. Often unavoidably, not necessarily intentionally.

100. For a brief and incomplete approximation of "genuine community," see *infra* note 103 and accompanying text.

disruption.[101] The moment we (can) no longer participate in the above three realms of bargaining activity (for individual utility maximization with only collateral benefits to some secondary and subordinated collective welfare), the pseudo-community of modern life comes to a crushing end and with no real community to replace it. Real community is now rarely practiced, and little-to-no real community structures have been arranged (or have survived) in a resilient and sustainable manner.[102] Half a century ago, Philip Slater suggested as "three human desires that [were already then] deeply and uniquely frustrated by American culture":

> (1) The desire for *community*—the wish to live in trust and fraternal cooperation with one's fellows in a total and visible collective entity.
> (2) The desire for *engagement*—the wish to come directly to grips with social and interpersonal problems and to confront on equal terms an environment which is not composed of ego-extensions.
> (3) The desire for *dependence*—the wish to share responsibility for the control of one's impulses and the direction of one's life.[103]

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101. For example, according to the March 2018 report by the national transportation research group TRIP, "[s]eventy percent of Americans over fifty live where [public] transit does not exist or serves the area very poorly." TRIP, PRESERVING THE MOBILITY AND SAFETY OF OLDER AMERICANS 7 (2018), http://www.tripnet.org/docs/Older_Americans_Mobility_TRIP_Report_2018.pdf. A significant "majority of older Americans—79 percent—tend to live in car-dependent suburban and rural communities, which typically require frequent, longer distance trips by automobile." *Id.* at 5. As a result, for Americans "65 and older, 90 percent of travel takes place in a private vehicle, and for Americans 85 and older, 80 percent of travel occurs in a private vehicle," *id.*, while "public transit accounts for just two percent of trips." *Id.* at 7. Today, the illusion of private autonomy and self-mobility (i.e., auto-mobility), on average, always ends for personal reasons: physical and mental frailty and deteriorating health means that "[m]en typically outlive their driving days by seven years and women by ten years." *Id.* at 6.

102. For a detailed discussion of the dynamic, multinodal, thus, rich and *complex* reciprocity that undergirds a genuine community infrastructure in the context of community-supported agriculture and locally-based community economic development, see Sarah Waring, *Complex Reciprocity in a Local Food System*, 41 W. NEW ENG. L. REV. 543 (2019).

103. PHILIP E. SLATER, THE PURSUIT OF LONELINESS: AMERICAN CULTURE AT THE BREAKING POINT 5 (Beacon Press 1970). It should be noted that these three human desires are not meant herein as either absolute or the only goals of communal innovation, etc. Rather, they merely (but pervasively) signal, as *frustrated* desires, the *ambivalence* that (most) people encounter as "individuals in chosen isolation" in their modern societies, as well as the *lack of agency* by those same people to develop principled and co-existent notions of community *and* individuality that could be lived and experienced *in synthesis* (i.e., not in opposition, thus, not in competition) with each other. As proposed herein, our community ecology has to reach a realm of both individuality and community that transcends utility- and exchange-based notions of reciprocity/mutuality, and in which their currently prevailing mutual exclusivity (i.e., more of one inevitably means less of the other in our modern individuality-community equilibrium) no longer applies. *See infra* note 153 and accompanying text.

## B. *Community Resilience & Community Intrapreneurship*

Accordingly, how can we, the "common people of the Anthropocene,"[104] innovate our neglected and contracting "community ecology" from the middle-out, foster pervasive socioeconomic innovation in anticipation of accelerating Anthropocenic disruption and, thus, intermediate the structures, institutions and practices needed for long-term, small-to-medium-scale "social-engineering resilience,"[105] sustainability, and equity? We *desperately* need advanced—that is, more radical, more egalitarian, more hybridized, more modular and decoupled,[106] better researched and understood, better intermediated and coordinated, and more widely adopted—structures, institutions and practices of mid-level socioeconomic organization and governance.[107] How do we teach individual, and design institutional, present-day and next-generation "resilience producers" to develop necessary research and practice tools for "synecology innovation"[108] and cooperative-community resilience?

One systemic, cross-cutting and common-denominator response in this regard is to right-level cooperative-community resilience,[109] therefore, to foster what could be termed "community-level intrapreneurship" (or "community intrapreneurship" for short).[110] Intrapreneurship—particularly, in the forms of "internal corporate

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104. *See infra* note 155 and accompanying text.

105. *See* Ahjond S. Garmestani et al., *Introduction: Social-Ecological Resilience and Law*, *in* SOCIAL-ECOLOGICAL RESILIENCE AND LAW 1, 5–6 (Ahjond S. Garmestani & Craig R. Allen eds., Columbia Univ. Press 2014) ("Ecological resilience is the amount of disturbance required to flip the system into an alternative state, whereas engineering resilience is the capacity of a system to absorb a disturbance and return to a stable equilibrium state."); *cf.* C.S. Holling, *Engineering Resilience Versus Ecological Resilience*, *in* ENGINEERING WITHIN ECOLOGICAL CONSTRAINTS 31, 31 (Peter Schulze ed., 1996) (distinguishing engineering resilience from ecological resilience).

106. *See* Hoffman & Jennings, *supra* note 9, at 12.

107. *Cf.* Martha T. McCluskey et al., *Law and Economics: Contemporary Approaches*, 35 YALE L. & POL'Y REV. 297, 300 (2016) ("[W]e need more, not fewer, accounts of how law can improve economic justice and economic policy.").

108. *See infra* note 118 and accompanying text.

109. For a detailed discussion of the myriad practical, policy and regulatory challenges in right-leveling cooperative-community resilience, using the example of local currencies (i.e., community-based currency systems) as a key tool in building local monetary resilience, see Rohan Grey, *Monetary Resilience*, 41 W. NEW ENG. L. REV. 505 (2019).

110. *See* KENNETH E. PIGG, N. CENT. REG'L CTR. FOR RURAL DEV., RURAL ECONOMIC REVITALIZATION: THE COOPERATIVE EXTENSION CHALLENGE IN THE NORTH CENTRAL REGION 9 (1986) (using the term "community intrapreneurship" in order to discuss internal development or intrapreneurship strategies for community economic development in local communities).

entrepreneurship" and "social intrapreneurship"—is generally defined as entrepreneurship *within* an already established collective (group, organization, etc.).[111] In its Old-French etymology ("entreprendre," to "undertake"), entrepreneuring, that is, undertaking an enterprise, means to "take [matters] in hand," often with a "spirit of daring."[112] Today, entrepreneurship (including so-called "social entrepreneurship"[113] within the purportedly "new," "sharing," "platform," or "sustainable economy"[114]) perennially overemphasizes the individual as the crucial driver of social change and progress—a visionary, risk-embracing, disruptive islander, surrounded by a sea of faceless and feckless wealth-production drudgery, who ingeniously can hack the outdated and outmoded production systems and shift low-yielding productive resources into innovative, higher-productivity applications with greater yields, greater-concentrated private wealth, but also with the professed collateral benefit of greater welfare for all.[115] What banal (and also dangerous) hogwash! Humans are always "change agents," hence, entrepreneurs and intrapreneurs all of the time. We constantly have to be entrepreneurial, that is, creative, risk-taking and disruptive (if not, daring) in our personal lives and reinvent and redefine the boundaries and resource usage of our most precious "capital"—namely, our own limited life that with every passing day is a day further away from its alpha and a day closer to its omega.

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111. Olivier Basso, *'Intrapreneurship': Corporate Entrepreneurship Developing an Entrepreneurial Dynamic Within Large Businesses*, *in* HANDBOOK OF TOP MANAGEMENT TEAMS 460, 460–61 (Frank Bournois et al. eds., 2010) ("[Intrapreneurship is referred to as] corporate venturing, corporate entrepreneurship or internal corporate entrepreneurship."); Darian M. Ibrahim, *Intrapreneurship*, 73 WASH. & LEE L. REV. 1741, 1750 (2016) (discussing intrapreneurship generally); Paul Tracey & Neil Stott, *Social Innovation: A Window on Alternative Ways of Organizing and Innovating*, 19 INNOVATION 51, 53–54 (2017) (defining "social intrapreneurship").

112. *Enterprise (n.)*, ONLINE ETYMOLOGY DICTIONARY, https://www.etymonline.com/word/enterprise (last visited Apr. 12, 2019); *Entrepreneur (n.)*, ONLINE ETYMOLOGY DICTIONARY, https://www.etymonline.com/word/entrepreneur (last visited Apr. 12, 2019).

113. Tracey & Stott, *supra* note 111, at 52–54.

114. For general criticism of these rather delusional and misleading labels and their underlying commercial practices and realities, see generally Frank Pasquale, *Two Narratives of Platform Capitalism*, 35 YALE L. & POL'Y REV. 309 (2016). For a critical account of entrepreneurship in the realm of community economic development, see Rashmi Dyal-Chand & James V. Rowan, *Developing Capabilities, Not Entrepreneurs: A New Theory for Community Economic Development*, 42 HOFSTRA L. REV. 839, 839 (2014).

115. *Cf.* Joel Mokyr, *Bottom-Up or Top-Down? The Origins of the Industrial Revolution*, 14 J. INST. ECON. 1003, 1003 (2018) (discussing how "small elites of intellectuals and craftsmen, what are rapidly becoming known as 'upper-tail human capital'" were the principal drivers of "technological progress during and after the Industrial Revolution").

Similarly, as intrapreneurs, we also constantly reinvent and redefine the boundaries and resource usage of human cooperation in our collectivized and organizationally-situated interactions with others—namely, family, co-workers, neighbors, etc.—constantly "spot[ting] gaps between intra-[organizational] capabilities and extra-[organizational] societal needs."[116] Our ability to reinvent and innovate our cooperative-collaborative world with others is dependent on the relational, communal, and institutional embeddedness of our personal action, thus, on our "intrapreneurial organizational ecosystem." Such ecosystem, however, has always been, at best, pedestrian. We are mostly fortuitous intrapreneurs—reacting merely to external pressures. We usually take the relative openness of our intrapreneurial ecosystem for granted and, essentially, deem it impervious to deliberate change.[117] Accordingly, we rarely consciously cultivate our "synecology"—that is, our *community* ecology[118]—through systematic and properly scaled sociopolitical and socioeconomic innovation. We rarely purposefully disrupt and (re)design the communal and institutional ground-level realms in which we try to better the aggregate welfare of our lives. We rather leave it (indeed, delegate it) to distant, disconnected and anonymous others—usually, non-profit governments distributing public goods and accumulations of private financial capital seeking profits—to provide for our collective welfare infrastructure and to distribute, inefficiently and inequitably, the benefits as well as the massive present and future costs of our common welfare production.[119]

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116. Tamara C. Belinfanti, *Contemplating the Gap-Filling Role of Social Intrapreneurship*, 94 OR. L. REV. 67, 69 (2015).

117. *Cf.* Danielle Kie Hart, *Cross Purposes & Unintended Consequences: Karl Llewellyn, Article 2, and the Limits of Social Transformation*, 12 NEV. L.J. 54, 77 (2011) (footnotes omitted) ("[S]ymbolic violence . . . results when actors *misrecognize as natural* the hierarchies and systems of domination produced through the struggle within fields to determine legitimacy, and agree to play by the rules of the game as laid out for them."); Athena D. Mutua, *Introducing ClassCrits: From Class Blindness to a Critical Legal Analysis of Economic Inequality*, 56 BUFF. L. REV. 859, 861–62 (2008) (footnote omitted) ("Th[e] 'market,' a complex system involving millions of participants . . . is . . . discussed as if it is a naturally occurring phenomenon, like water, or oil, or trees, one that is outside the control, creation, purview, activity, and even influence of human agency.").

118. *See, e.g.*, EUGENE P. ODUM, FUNDAMENTALS OF ECOLOGY 8, 145–48 (W.B. Saunders Co., 2d ed. 1959) (distinguishing concepts of "autecology," "synecology," and within the latter, "community ecology," and further discussing community ecology).

119. *Cf.* Eileen Crist, *Beyond the Climate Crisis: A Critique of Climate Change Discourse*, 141 TELOS 29, 55 (2007) ("*The real problem*—the industrial-consumer complex that is overhauling the world in an orgy of exploitation, overproduction, and waste—is treated with kid gloves, taken as given, and regarded as beyond the reaches of effective challenge.").

So, one may posit that we have to put more emphasis on innovating our "social-capital synecology" and foster contrarian (if not, subversive), non-mainstream intrapreneurship *from the middle-out*—through personal efforts, within our own individual lives, and together with those whom we interact with directly and non-anonymously day after day.[120] Much of social-capital research is concerned with micro-to-meso-to-macro transitions.[121] In contrast, the "right-leveling" concern and focus here is with micro-to-meso and macro-to-meso transitions. It is the meso-level—the communal level of social capital—that bonds, braces, bridges, thus, organizes and embeds micro-levels (i.e., relational/group) and macro-levels (i.e., institutional/social) of human cooperation. Thus, assuming—for the sake of this Foreword—that middle-out social engineering is a suitable way forward, how can we make more of it happen together?[122] Obviously, middle-out starts with every one of us. We always create the small-scale differences in how we live out every one of our limited days and persevere in implementing small steps one step at a time. Middle-out social engineering also requires smart tools and focused experimentation.[123] Here, we are, at best, at the ideation stage.[124]

## III. LAW (AND LAW LEARNING)

> *"We must . . . revisit law in its entirety to understand its role in the Anthropocene. We must look at how our new condition is to be read into the very DNA of law."*[125]

120. Thus, in starkest-possible contrast to mainstream "social intrapreneurship," the middle-out cooperative-community intrapreneurship conceptualized here never "emphasize[s] [any] notion that [we] should treat social problems as commercial opportunities." Tracey & Stott, *supra* note 111, at 54. For a detailed discussion of the role of consumer advocacy in addressing climate change and, therefore, as a means for affecting top-down social engineering in the regulatory space, see Elizabeth A. Stanton, *Kitchen Tables, Board Rooms, and Other Potentially Disruptive Locales: The Role of Consumer Action in Carbon Emission Reduction*, 41 W. NEW ENG. L. REV. 553 (2019).

121. *See, e.g.*, James S. Coleman, *Social Capital in the Creation of Human Capital*, 94 AM. J. SOC. S95, S98 (Supp. 1988) ("[T]he principal virtue of economic theory . . . [is] its ability to make the micro-macro transition from pair relations to system.").

122. *See* Rowan, *supra* note 10, at 449 ("The question of *what* [*is to be done?*] then is coupled with its more difficult, demanding twin: *how is it to be done?*").

123. *Cf.* Cooke et al., *supra* note 3, at 832 ("[D]iversity of social theory engagement is in many respects a strong point of resilience thinking, encouraging experimentation and avoiding dogma"); Hoffman & Jennings, *supra* note 9, at 24 (mentioning, only in passing, "consortia of organizations that can broker local experiments").

124. *See* Palsson et al., *supra* note 15, at 11.

125. Viñuales, *supra* note 86, at 9.

*–Jorge E. Viñuales*

Economic and political realms are characterized by power, scale and majorities, and efficiency and compromise. Only the social realm introduces positioning[126] (or social function or status), resultant moral and legal rights and responsibilities and, with it, authority, law and (in)justice. Political-economic governance is merely the means by which a human society constantly provides and replenishes a common good—for both its current and future generations. In this regard, law is a fundamental example and element of the social. *A priori* and teleologically, it is accepted as a necessary behavioral constraint to direct and engineer political and economic systems and the governance of social-capital organization. Thus, law is a public good and a special form of social capital: it constitutes the *formal* bracings in the "cooperative infrastructure of our societies."[127] Law "bridges" the normative distance between our personal, social and political-economic spheres. Law is also "one of the major technologies accounting for the Anthropocene; a 'soft' technology alongside the 'hard' technologies relating to energy, agriculture, chemicals, building, transportation, and others that seem to have captured most of the attention."[128] Accordingly, how can, should, and will law change in times of Anthropocenic disruption?[129] Arguably, this is the

126. *See* Tony Lawson, *Social Positioning and the Nature of Money*, 40 CAMBRIDGE J. ECON. 961, 963–65 (2016).

127. Fehr & Gächter, *supra* note 49, at 167; *see also* Bruce Miller, *The Place of Law in Ivan Illich's Vision of Social Transformation*, 34 W. NEW ENG. L. REV. 507, 517 (2012) (quoting IVAN ILLICH, TOOLS FOR CONVIVIALITY 95 (1973)) ("The continuity of legal norms allows, even obligates, the participants in adjudication—the parties, the lawyers, the judges—constantly to adapt these norms, or what Illich called the 'social experience' of our legal forebears, to our deepest present controversies."); Robinson, *supra* note 34 ("When law has integrity, it is because it reflects profound social norms, shared in a society . . . .").

128. Viñuales, *supra* note 86, at 8; *see also* Grear, *supra* note 21, at 241 ("[L]aw in general . . . [is] *unresponsive—at a fundamental level*—to the ethical implications of the vulnerable embodied biomateriality of the living order."); Robinson, *supra* note 34, at 13 ("The discipline of the law is deeply implicated in the systems that have caused the end to the Holocene . . . .").

129. Changes in legal social-capital norms often happen much faster than changes in non-legal social-capital norms. Unlike social mores, norms, customs, traditions, and institutions, most legal norms rarely "display a great deal of inertia," Williamson, *supra* note 50, at 597, but are rather subject to constant metamorphosis—if only incrementally, yet, on a manifold daily basis. Nonetheless, changes of legal norms, in general, have to be "officiated" in some manner or form in order to be socially accepted as legitimate and binding. Accordingly, "th[is] rigidity of our current legal framework is not well-suited to [efficiently respond to] the complexity of social-ecological systems" and their disruption and transformation in the Anthropocene. Garmestani et al., *supra* note 105, at 11; *see also* Baker, *supra* note 91, at 582 ("Legal scholars can and must map new adaptive legal pathways to help aid the transition from an economic

largest, most-pressing question facing the entire legal profession today. But, unfortunately, legal science (as one of the social sciences) and legal practice think and discuss little to nothing in this regard. Notwithstanding law's special status and core functionality within social capital, any current academic or applied inquiry into legal implications of, legal responses to, and, in particular, legal social-capital erosion due to, Anthropocenic disruption is still, at best, nascent and timid.[130]

### A. *Community Resilience & Law*

Today, for example, good business law advice becomes increasingly more specialized, thus, higher-priced and exclusive. As any other social-capital resource, business law advice is scarcity-manipulated and, preferably, sold to the highest bidder—usually for purposes of further maximizing already existing concentrations of private wealth. Resultant profits then become used, among other things, for the future bidding and access to additional high-octane legal advice, geared, at all times, at minimizing private responsibility for an efficient distribution of the social benefits and costs generated—all justified by supposedly rational social choice, driven by an invisible-hand price mechanism, and resulting in a social meritocracy of entitlements without attendant duties. The intellectual drivers behind this universal wealth-maximization nonsense[131] are our utopian political traditions that emphasize individual freedom, individual choice, and the autonomy and independence of humans as first and foremost private subjects with an innate right to chart their own path through life in order to attain a fuzzy, inherently non-permanent state of so-called "happiness." Granted, when (certain) people wanted to secede

development paradigm rooted in neoliberalism, to a more dynamic law that recognizes the collective enterprise of existence in a destabilized world.").

130. *See* Viñuales, *supra* note 86, at 5–7. A *Google Scholar* title search for the last decade (2009-2019)—conducted on February 12, 2019, with the search term "allintitle: Anthropocene"—returned approximately 4,760 hits for such topic. Similar title searches on the same date and for the same time period (a) with the search term "allintitle: Anthropocene law" (i.e., both words in title but not exact phrase) returned only sixty-seven results, and (b) with the search term "allintitle: Anthropocene law -international -transnational -global -environmental -eco -ecological -ocean" (i.e., excluding international and environmental law dimensions) returned a mere twenty results.

131. When wealth maximization has become its own end and, therefore, as simultaneously a means and an end, has no longer any purpose or goal and, in principle, can only refer to and repeat itself and keep maximizing until all resources are perfectly maximized and, therefore, perfectly annihilated (because once all natural and social capital has been converted into financial capital, the total(itarian) value of all financial capital is zero), there is, accordingly, no sense to be found in maximizing wealth. *Cf.* Chen, *supra* note 4, at 754 ("The wealth of the Great Acceleration, as it happens, may be illusory.").

from the British crown, they, of course, had to emphasize this irrational nonsense of militant individualism for the (paradoxical) purpose of building a collective political platform. However, each of us, having been fortunate enough to live into adulthood, can easily attest that we all existentially depend on the kindness of both loved ones and complete strangers in *everything* we do every day. We all live on borrowed time, borrowed beneficence and benevolence, and, most existentially, borrowed Earth.[132] Accordingly, one could posit that a crucial objective in this realm for intrapreneurial law and law learning in the accelerating Anthropocene is to support both our "absorptive capacity"[133] *and* our "adaptive capacity"[134] for socially innovative, non-utopian ideas and practices that go beyond those principally fueled by their profit-orientation, at all cost, and their accentuation of the perpetually competing and utility-scheming individual, over and above everyone else. Translated into the law-learning realm of business law and, in particular, of business organizations law, this requires a systematic shift of focus away from the protection of insatiable greed (euphemistically labelled "wealth maximization") and insatiable power (euphemistically sanitized as "control").[135] It requires a shift away from the reductionist, "decollectivizing" and disembodied treatment of business organizations as *lean*, *mean*, *money-making machines* for a chosen few whom we deem worthy enough to be recognized in, and matter for purposes of, business organizations law, namely, the receivers of maximized wealth (owners) and the wielders of control (managers). And it requires a marked shift and a lot of new focus, scholarly inquiry and, most importantly, teaching energy *towards* what I will call "focused protocommunal experimentation."[136]

Like wealth, law is a means, not an end in itself. Its purpose is to enable people to organize their cooperation in ways deemed beneficial on both individual and collective levels of welfare organization and

132. *Cf.* Hudson, *supra* note 38, at 942 ("[Humans] have known for some time that we are living on borrowed Earth—using more planet than we actually have available.").

133. *See* Wesley M. Cohen & Daniel A. Levinthal, *Absorptive Capacity: A New Perspective on Learning and Innovation*, 35 ADMIN. SCI. Q. 128, 128 (1990).

134. *See, e.g.*, J.B. Ruhl, *General Design Principles for Resilience and Adaptive Capacity in Legal Systems—with Applications to Climate Change Adaptation*, 89 N.C. L. REV. 1373, 1388–89 (2011).

135. *Cf.* Reich-Graefe, *supra* note 24, at 505 n.185.

136. The qualifier, "focused," is meant to signal that we have neither the natural nor the time resources for infinite, ever-spontaneous, uncoordinated, highly-replicative, trial-and-error experimentation. We have to critically undertake legal and non-legal social-capital experiments "off mainstream," but do so in "smart" (i.e., concerted, sophisticated and nonreplenishable-resources-preserving) ways.

production. Thus, business organizations law needs to resurrect and (re)adapt simple, balanced, and resilience-efficient tools—which have been almost lost in today's specialized and "exclusified" realms of (business) law advice[137]—in order to enable and support middle-out social engineering and community intrapreneurship with as much organizational self-regulation and as little need for pre-association bargaining and governance customization as possible. Here are three categories of "arable land" in this regard that have been left "fallow" in the business law orthodoxy for somewhere between five decades and more than a century: "new-old" *forms* of middle-out organization, particularly, cooperatives;[138] "new-old" *theories* of middle-out organization, particularly, the ontological and philosophical foundations of associations and organizations of human (economic) cooperation;[139] and "new-old" *techniques* of middle-out organization,[140] particularly, as regards its

137. *See* Baker, *supra* note 91, at 582 ("[A] radical break from modern law requires reviving legal precepts long buried under the weight of the neoliberal economic development project . . . .").

138. *See generally* Elaine Waterhouse Wilson, *Cooperatives: The First Social Enterprise*, 66 DEPAUL L. REV. 1013 (2017) (providing an overview of the nature, governance and function of cooperatives). The standard treatise on the law of cooperatives ceased publication after its fourth edition in 1970. ISRAEL PACKEL, THE ORGANIZATION AND OPERATION OF COOPERATIVES (4th ed., ALI-ABA 1970). As a parallel development, "it is particularly revealing that the emergence of a fully capitalistic legal subject in the form of the corporation was pivotal to the colonial development of the international legal order and remains a core—if not the central—feature of the contemporary global order." Grear, *supra* note 21, at 238 (emphasis omitted).

139. *See generally* Joshua Getzler, *Frederic William Maitland—Trust and Corporation*, 34 U. QUEENSLAND L.J. 171 (2016) (exploring Maitland's ontological, philosophical and legal comparison of the nature and history of corporations under English and German law). The United Kingdom's Partnership Act 1890—largely declaratory of existing British partnership case law at the time, the world's first partnership statute, and the blueprint for the Uniform Partnership Act of 1914 in the United States—was based on a legislative bill drafted by Sir Frederick Pollock in 1879 and "has remained virtually unscathed through over a century of change" in the United Kingdom. GEOFFREY MORSE, PARTNERSHIP LAW 10–11 (Oxford Univ. Press, 7th ed. 2010); *cf.* Viñuales, *supra* note 86, at 8.

> [T]o understand the role of law in the Anthropocene, lawyers would do well to look more widely at the laws shaping industrial organisation . . . . [and] should even go further and revisit fundamental legal categories, such as . . . 'responsibility/liability', 'legal personality', [and] 'corporation' . . . to understand how they may have played (and may still play) a role in prompting and sustaining the Anthropocene as well as how they may be adjusted or perhaps replaced in the law of more resilient and more respectful human societies.

*Id.*

140. *See* Steven Ferrey, *Anthropocenic Disruption in World Energy: Response of International Law*, 41 W. NEW ENG. L. REV. 475 (2019) (providing a detailed discussion of a "new-old" technique and model of middle-out organization in the energy sector, utilizing small-

default "dissension management design."[141] To state the obvious here, focused protocommunal experimentation in (business organizations) law will only happen when law schools (re)start teaching (at least, some of the tools for) it.

### B. *Community Resilience & Law-Learning Intrapreneurship*

Our (law) students, by definition, are future social engineers and social-capital resilience producers. If we want them to engineer differently—namely, middle-out, not top-down, not bottom-up[142]—we have to teach them to engineer differently. Focused protocommunal experimentation in intrapreneurial law learning, therefore, requires us to radically "de-mainstream" and bypass our current conventions of higher education. The overall goal, here, is to create experimental, non-institutionalized educational realms dedicated to community-learning and community-building *for their own sakes*, thus, rejecting the narrow utilitarian and neoliberalist professional agendas that regularly and arrogantly aspire to turn students, as everyone else, into "productive

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scale power purchase agreements for renewable power to foster renewable energy development in developing countries).

141. U.S. partnership-law default rules provide for strong-form inter-partner and intra-partnership fiduciary loyalty and a unilateral dissolution right for every at-will partner in order to (indirectly) address dissension. The effect of such default dissension management design is that the partners have to keep everyone in their midst reasonably well-treated and sufficiently satisfied in order to continue the partnership. Thus, in principle, partnership law forces partners to manage dissension in a way that supports a continued common-interest equilibrium. In contrast, *traditional* U.S. corporate-law rules provide incentives to majority shareholders to opportunistically let dissension deteriorate and to benefit their personal interests at the expense of the minority. Whereas partnership law is designed to "prop up," stabilize, and protect the "common firm interest," the design of corporate law provides opportunistic incentive to "tear down," destabilize, and disregard the common firm interest post-investment and to expropriate economic rents from the minority. For middle-out, communal-level dissension management, the much older, quasi-ancient partnership-law design is much more effective and "right-leveled." *See* Baker, *supra* note 91, at 582–84 ("[There is] flexibility within contract law, [the] collective ownership of property[,] . . . [and the] develop[ment of] alternatives to limited liability forms and other business models that externalize the risks of their activities."). For a detailed discussion of why resilience frameworks and, in particular, their *design* are crucial in the context of effective regulation and sound regulatory policy (using the federal Farm Bill and the goal of nationwide sustainable agriculture as an example), see Laurie Ristino, *Surviving Climate Change in America: Toward a Rural Resilience Framework*, 41 W. NEW ENG. L. REV. 521 (2019).

142. *See* DAVID LONG & ZANE SCOTT, A PRIMER FOR MODEL-BASED SYSTEMS ENGINEERING 13 (2d ed. 2011) ("Systems engineering can be applied to three classes of problems: top-down or 'clean-sheet' problems, middle-out or system-improvement problems, and reverse-engineering or system-replacement problems."). "With suitable approach variations, the systems engineer can address reverse (or bottom-up) and middle-out systems engineering perspectives as well." *Id.* at 24.

members of society."[143] In law learning, we are all a generation of learner-teachers and current and future social engineers, who learn and teach, by either default or design—and who, therefore, can also be encouraged, *by design*, to cooperate and innovate from the middle-out and to systematically and prospectively help generate social-capital "meta-resilience" (i.e., social-capital resilience tools that coordinate and intermediate the creation and maintenance of cooperative-community resilience). There is no (nor can there ever be a) standardized, utility-driven, *a priori* script and how-to manual of "meta-resilience production." However, there appear to be certain cross-cutting *precepts*—moral and organizational principles[144] of no particular order or priority, but of general relevance and applicability—that should inform the current ideation stage of community intrapreneurship and the side-streaming of (law) learning so as to better bestow robust and resilient social-engineering forms, theories, and techniques of right-leveled law to our current and next generations of "law-tending" people at the dawn of Anthropocenic disruption.

1. Self-Government

Constituting communitarian forms of cooperation and collaboration in learning and lawyering, the power of learners here dictates, but rarely achieves, self-government.[145] Self-government includes the power to self-*regulate* ("by a 'jurisdiction' inherent in" the group of learners and by the group's "agency, in the broad philosophical sense of a capacity to act

143. From the "cozy" and "hard-earned" hegemonic midst and ideological hostility of such membership of self-proclaimed producers, its eternal deviant and subversive nemesis has long "been classified by the law as 'a sturdy rogue,' or perhaps, 'an idle vagabond.'" Bruce K. Miller, *A Sturdy Rogue*, 26 W. NEW ENG. L. REV. 109, 109–10 (2004) (citation omitted) (quoting JACOBUS TENBROEK, FAMILY LAW AND THE POOR 205 (Joel F. Handler ed., Greenwood Publishing Co. 1964)).

144. These principles are deemed necessary (in higher learning and elsewhere) in order to keep matters focused, balanced, consistent, honest, and immune to the many opportunities of corruptibility presented by the collective realm of human cooperation. *Cf.* TAWNEY, *supra* note 13, at 1 ("It is a commonplace that the characteristic virtue of [humans] is their power of sustained practical activity, and their characteristic vice a reluctance to test the quality of that activity by reference to principles.").

> [In order to obtain] a clear apprehension both of the deficiency of what is, and of the character of what ought to be. . . . [one] must appeal to some standard more stable than the momentary exigencies of . . . commerce or industry or social life, and judge them by it. [One] must, in short, have recourse to Principles.

*Id.* at 2–3. "[P]lenty depends upon co-operative effort, and co-operation upon moral principles." *Id.* at 5.

145. *Id.* at 7 ("[M]en should not be ruled by an authority which they cannot control.").

rationally and legally as a unified entity"[146]), the power to self-*govern* (i.e., "the autonomous power to broker and settle internal conflict"[147]), and the power to self-*enforce* (i.e., to control power not in "justiciable . . . form, but [by] the moral idea that the wielder of public power does so for the *Zweck* [purpose] of public welfare"[148]). The power and self-government of learners in "finding their own ways"[149] should, of course, be supported by law teaching and, particularly, law tutoring.[150] However, at its core, it must remain fundamentally unregulated by law schools and the "bean-counting," feudalizing corporatocracies of today's legal-education mainstream.[151] And it will require significantly more self-discipline of learner-teachers than currently prevails.[152] In other words, law learning, both free-form and institutionalized, has yet to deliver, in a practical, non-utopian manner, "the Holy Grail of political theory—how natural persons may create enforceable associations that guarantee cooperation and mutual help and do not become sources of coercion and oppression."[153]

2. Common Equity

As non-proprietary, non-possessory, common-interest-based learning endeavors, no personal profit maximands of any sort may attain—other than learning-teaching and creating indivisible common welfare. Thus,

146. Getzler, *supra* note 139, at 188.

147. *Id.*

148. *Id.* at 189.

149. *See supra* note 17.

150. The etymology of tutoring involves the "guard[ing]," "look[ing]" after, and protecting of learners. *See* WALTER W. SKEAT, AN ETYMOLOGICAL DICTIONARY OF THE ENGLISH LANGUAGE 669 (1882); *Tutor (n.)*, ONLINE ETYMOLOGY DICTIONARY, https://www.etymonline.com/word/tutor (last visited Apr. 12, 2019).

151. *See generally* Lucille A. Jewel, *Bourdieu and American Legal Education: How Law Schools Reproduce Social Stratification and Class Hierarchy*, 56 BUFF L. REV. 1155 (2008); Harold McDougall, *The Challenges of Legal Education in the Neoliberal University*, 72 NAT'L LAW. GUILD REV. 65 (2015); Frank Pasquale, *Synergy and Tradition: The Unity of Research, Service, and Teaching in Legal Education*, 40 J. LEGAL PROF. 25 (2015). As a result, intrapreneurial law learning in its communal application needs to follow a "de-mainstreaming principle." *Cf.* Hoffman & Jennings, *supra* note 9, at 19 ("Anthropocene studies must explore other, less prominent, voices, using means and channels that may lie outside the mainstream."); *see also* Belinfanti, *supra* note 116, at 83 ("[I]ntrapreneurship is a private ordering [communal] activity that takes place in the absence of regulation or other legal directive.").

152. *See, e.g.*, W. Barton Leach, *Property Law Taught in Two Packages*, 1 J. LEGAL EDUC. 28, 30–31 (1948) (describing various qualities that law schools should help instill in their learners, including, as the final one, "pervading all [other qualities], and possibly the only one that is really basic: *self-discipline in habits of thoroughness*, an abhorrence of superficiality and approximation").

153. Getzler, *supra* note 139, at 188–89.

there is no (extra) money to be made, no (extra) academic credit to be gained, no promotions to be had, no officious titles or recognitions to be awarded, and no other reputational income or distinguishing and validating conspicuity to be generated[154]—all of which, in today's consumption- and competition-oriented "educational markets," is usually associated with personal "success" and professional "recognition," and then inevitably touted in glossy-magazine law-school marketeering. Community is "everybody" together, constituting, *ipso facto*, the "common people."[155] And the essence of everybody's positioning (or social function or status) within a larger collective purpose is that of an agent of, and within, indivisible, inalienable, and "team-productive"[156] common equity. One "does not perform [the function] merely for personal gain or to gratify [one]self, but recognizes that [one] is responsible for its discharge to some higher authority."[157] Thus, "[i]n practice . . . , if [community] is to be healthy, [people] must regard themselves not as the owners of rights, but as trustees for the discharge of functions and the instruments of a [communal] purpose."[158]

3. Communality

The goal here is to completely sidestep non-aggregated, atomistic self-interest, and to constantly develop communality and collaboration over separation and competition. If we seek to encourage people to start changing their belief systems—in particular, to learn that we always have more in common with each other than whatever may separate us—we have to bring people together. Our constant (non-)Bayesian updating[159] of what we believe makes the future predicable requires this to be an

154. In other words, "resilience-engineering work" in Anthropocenic-disruptive times is work without external reward other than "maintenance welfare" (i.e., welfare that is the absence of current or future disequilibria changes).

155. *See Community (n).*, ONLINE ETYMOLOGY DICTIONARY, https://www.etymonline.com/word/community (last visited Apr. 12, 2019).

156. For a discussion of the team production model, see, for example, Brian R. Cheffins, *The Team Production Model as a Paradigm*, 38 SEATTLE U. L. REV. 397 (2015).

157. TAWNEY, *supra* note 13, at 8. In other words, serious "moral limitation[s] on the pursuit by individuals of their economic self-interest," financial, reputational or otherwise, need to apply. *Id.* at 14. Accordingly, "success" is neither to be declared in the first place nor granted "to those whose existence is a struggle for self-aggrandizement." *Id.* at 49.

158. *Id.* at 51.

159. *See, e.g.*, Benjamin E. Hermalin & Michael S. Weisbach, *Assessing Managerial Ability: Implications for Corporate Governance*, *in* 1 THE HANDBOOK OF THE ECONOMICS OF CORPORATE GOVERNANCE 93, 153–54 (Benjamin E. Hermalin & Michael S. Weisbach eds., 2017) (discussing Bayesian and non-Bayesian updating); Barbara A. Noah & René Reich-Graefe, *Rational Patient Apathy*, 49 SETON HALL L. REV. 535, 583–85 (2019) (same).

*experiential* exercise. For most people, it simply cannot be accomplished in a purely intellectual realm of abstract reasoning. We have to bring people and their beliefs and, in particular, their residual empathy and kindness together—to help them not only understand but, first, even (re)acquaint themselves with the *commonality* of their human existence, therefore, their *communality* as living beings, therefore, their indivisible *community* in the first place.[160] Communality and common equity in our communities also, by definition, create a *body politic*—not a *persona ficta* of legal organization—but a genuine realm of scaled-down political economy that we desperately need to stop neglecting.[161]

4. Sufficiency[162]

First-world modern humans are slowly witnessing the accelerating destruction of communal and social conventions from the very bottom up. In the past, we were still able to maintain open, empty, and thus, creative spaces of learning-teaching. For the first time in human history, those spaces disappear as they are preempted by one detaching smartphone, one inoculating wireless connection, one alienating social-media account, and one single-minded professional video-gamer or *YouTube*-influencer aspiration at a time. In our first world of technology dependency, everyone is now given license (indeed, is giving herself license) to act as a neoliberalist elitist and old-style capitalist—with an inalienable right, *qua* her existence, to exploit her community supports, and to treat her communal and social realms as both a cost-dumping ground on the one hand and a resource-pilfering ground on the other hand.[163] Everyone is given license to treat her fellow beings as mere commodities that, depending on the opportunistic calculation of the moment, are either assets, impediments, or surplus to requirement *en route* to personal wealth maximization and evermore competitive aggrandizement endeavors aimed at appeasing instincts and exploiting insecurities. In this shallow

160. Accordingly, an essential "principle of universal solidarity" (and its profound recognition and pervasive practice) also applies.

161. Of course, communality and common equity are part of a much larger "indivisibility principle" that recognizes not only the indivisibility of all humans, but also a planetary "indivisibility of humans and their environments." Angela P. Harris, *Vulnerability and Power in the Age of the Anthropocene*, 6 WASH. & LEE J. ENERGY CLIMATE & ENV'T 98, 108, 137–39 (2014).

162. *Cf.* Robinson, *supra* note 34, at 21–22.

163. *Cf.* Wright et al., *supra* note 90, at 460 ("For global business and political elites (and the economics, finance and management professions which underpin them), the Earth continues to be viewed as simply a source of natural resources and a sink for the disposal of our economies' waste.").

endgame, less is never enough. Of course, less is also never more. Even more is never more. There is only one commoditization axiom: more is never enough.[164] So, let less be ever enough. Correspondingly, practice sharing and distributing accumulations of all kinds.[165] Thereafter, keep practicing with "more of less."[166]

5. Subsidiarity

No one can do any of this alone. All cannot do any of this together.[167] Cooperative-communal space is innately of a non-centralized, non-teleological design. It is subsidiary to the particularizing causes, abilities, and needs of its specific participants and members—an organizational form that follows function. Its design must even make allowance[168] for "accidentality"—for the "blundering into wisdom"[169] that is also our English common-law heritage. Accordingly, there is no room for competition or selectivity (for purposes of access, inclusion, or the

164. EPICURUS, THE EPICURUS READER 39 (Brad Inwood & Lloyd P. Gerson eds., 1994) ("Nothing is enough to someone for whom enough is little."); TAWNEY, *supra* note 13, at 43 ("They are never satisfied, nor can they be satisfied[;] . . . nothing short of infinity [can] bring them satisfaction."); *see also* SMALL IS BEAUTIFUL, *supra* note 24, at 16–17 ("An attitude to life which seeks fulfillment in the single-minded pursuit of wealth—in short, materialism—does not fit into this world, because it contains within itself no limiting principle, while the environment in which it is placed is strictly limited."). Accordingly, the logical outcome is far from "pretty." *See, e.g.*, CHRISTOPHER HITCHENS, LETTERS TO A YOUNG CONTRARIAN 19 (2001) ("Aspiring toward a consistent perfection . . . [is] aspiring toward annihilation. . . . [T]he goal of . . . striving . . . is nothingness."); CYRIL NORTHCOTE PARKINSON, PARKINSON'S LAW OR THE PURSUIT OF PROGRESS 85 (1958) ("Perfection, we know, is finality; and finality is death.").

165. That is, instead of wealth maximization, a "wealth-distribution maximization principle" applies (which aims to generate community welfare for the most recipients). *Cf.* Thomas Kleven, *Federalizing Public Education*, 55 VILL. L. REV. 369, 369 (2010) ("[D]emocracy requires a principle of equitable sharing pursuant to which the goods and bads of social life must be fairly distributed among all society's members.").

166. In other words, instead of wealth maximization, a "cost-minimization principle" applies (which aims to generate community welfare with the least external resources). Accordingly, there is also a subsidiary principle to use presently existing resources, that are currently available to the actor, and to prioritize resource usage from replenishable resources first, then renewable, to finally non-renewable resources.

167. Accordingly, there are "de-concentration" and "de-centralization principles" at work. *Cf.* Farley, *supra* note 4, at 1189 ("As in ecosystems, resilience is enhanced via redundancy and via overlap at different scales of legal jurisdiction, with considerable decentralization that allows experimentation and failure at lower scales without undermining resilience at higher scales."); Hoffman & Jennings, *supra* note 9 ("[I]n Anthropocene Society, . . . there will be more fracturing of processes and diversity in their expression.").

168. *See supra* text accompanying note 136.

169. Frederick W. Maitland, *Outlines of English Legal History, 560–1600*, *in* 2 THE COLLECTED PAPERS OF FREDERIC WILLIAM MAITLAND 438–39 (H.A.L. Fisher ed., 1911).

ultimate "neoclassical carrot," leadership)—instead, everyone contributes based on ability.[170] Likewise, there is no space for accountability or the institutional enforcement of "promises"—again, everyone is competent to contribute irrespective of others and of their conditional coercion. What is the point of continuing to institutionalize distrust (also known as monitoring)?[171] People who create this kind of communal space by thinking, learning-teaching, living, and finding their own ways[172]—by collaborating, but without the need to create limiting "network-effects" or alienating "we-identities" and, thus, without the need to exploit "targets" or stigmatize "nemeses"—understand that, at birth, this individual "portion" and promise called a human life has been endowed to them (for a purpose), never granted (as a right). It has been placed in their care, never their receivership. Human life neither competes for price nor prize.

6. Omnicentricity

The middle is everywhere—wherever we find it. The possibility for middle-out social engineering is therefore everywhere. In an ever-expanding middle-out universe, everyone is a center. No one is ever a synallagma[173] of another. The calculative ethics of reciprocity and mutuality—the Golden Rule,[174] Kant's *kategorischer Imperativ* [categorical imperative],[175] Rawls's veil of ignorance,[176] or whatever their incarnation may be—always result in Hardin's tragedy of the commons.[177]

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170. *Cf.* James G. Wilson, *A Dearth of Kindness: Using Buddhist Psychology to Evaluate Rawls, Nozick, and Contemporary Corporate Ideology*, 39 W. NEW ENG. L. REV. 499, 533–34 (2017) ("[A] social system becomes unstable or profoundly immoral if it fails to institutionalize the entire range of human motivations and/or fails to provide opportunities for the wide range of personality types that provide necessary diversity within human tribes.").

171. *See* Susan Verducci & Andreas Schröer, *Social Trust*, *in* INTERNATIONAL ENCYCLOPEDIA FOR CIVIL SOCIETY 1453, 1457 (Helmut K. Anheier et al. eds., 2010).

172. *See supra* note 17.

173. A synallagma is a mutual, requiting obligation that is owed in return for an opposite synallagma. Once consummated, both synallagmas cancel each other out—they (re)quit each other's existence. Thus, the ultimate utility of a synallagma lies in its extinguishment, thus, its end. *See, e.g.*, Mariusz Jerzy Golecki, *Synallagma as a Paradigm of Exchange: Reciprocity of Contract in Aristotle and Game Theory*, *in* ARISTOTLE AND THE PHILOSOPHY OF LAW: THEORY, PRACTICE AND JUSTICE 249, 249–50 (Liesbeth Huppes-Cluysenaer & Nuno M.M.S. Coelho eds., 2013).

174. Marcus G. Singer, *Golden Rule*, *in* 1 ENCYCLOPEDIA OF ETHICS 614–19 (Lawrence C. Becker & Charlotte B. Becker eds., 2d ed. 2001), available at https://search.credoreference.com/content/entry/routethics/golden_rule/0?institutionId=5908.

175. IMMANUEL KANT, GRUNDLEGUNG ZUR METAPHYSIK DER SITTEN [FUNDAMENTAL PRINCIPLES OF THE METAPHYSICS OF ETHICS] (Riga, Johann Friedrich Hartknoch 1785).

176. JOHN RAWLS, A THEORY OF JUSTICE (1971); s*ee* Wilson *supra* note 170, at 506–07.

177. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1243 (1968).

Now, we have reached its final chapter—an "Anthropocenic tragedy of the commons." Humanity only continues to survive because humans are, notwithstanding their often prevalent, preferred, and chosen social interactivity, irreducible to either reciprocals[178] or mutuals[179]—*quid-pro-quos* or *quid-pro-quids* of each other's utility function of self-aggrandizement and related social-capital predation. Thus, the simple rule, neither "golden" nor otherwise precious or glittery, is that, instead of treating others the way we want to be treated, we need to treat each and every one better—consistently better and at every point of engagement—than we would ever expect or want to be treated.[180] This appears the only feasible way to compensate for the systemic freeriding that is our current post-postmodern state of "coopetition,"[181] and, thus, the only way to create, in small middle-out steps, a common surplus of, at least, beneficence, if not, ultimately, benevolence.

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> Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.

*Id.* at 1244; *cf.* DAVID HUME, A TREATISE OF HUMAN NATURE, bk. III, pt. II, § V, 520–21 (L.A. Selby-Bigge ed., 1896) (1739), made available at http://oll.libertyfund.org/titles/hume-a-treatise-of-human-nature.

> Your corn is ripe to-day; mine will be so to-morrow. 'Tis profitable for us both, that I shou'd labour with you to-day, and that you shou'd aid me to-morrow. I have no kindness for you, and know you have as little for me. I will not, therefore, take any pains upon your account; and should I labour with you upon my own account, in expectation of a return, I know I shou'd be disappointed, and that I shou'd in vain depend upon your gratitude. Here then I leave you to labour alone: You treat me in the same manner. The seasons change; and both of us lose our harvests for want of mutual confidence and security.

*Id.*

178. While the *homo economicus* of economic modelling is strictly driven by advancing her *material* self-interest, *homo reciprocans* is already placing "direct utility value . . . on rewarding or punishing," accordingly, also on being rewarded or punished. *See* Thomas Dohmen et al., *Homo Reciprocans: Survey Evidence on Behavioural Outcomes*, 119 ECON. J. 592, 592 (2009) (internal citations omitted).

179. In a related biological realm, mutualistic bacteria (engaging in symbiosis that is beneficial to both participating organisms) have been aptly described as "favor traders." Michael Pollan, *Some of My Best Friends Are Germs*, N.Y. TIMES: MAGAZINE (May 15, 2013), https://www.nytimes.com/2013/05/19/magazine/say-hello-to-the-100-trillion-bacteria-that-make-up-your-microbiome.html.

180. Fully collectivized, sociopolitical compromise in the common will now incrementally raise ceilings rather than continue to perpetually lower our social-capital floors.

181. *See generally* Maria Bengtsson & Sören Kock, *"Coopetition" in Business Networks—to Cooperate and Compete Simultaneously*, 29 INDUS. MARKETING MGMT. 411 (2000) (discussing the simultaneous practice of cooperation and competition in business relationships).

All of this, then, is a radical and urgent search for a "new middle," thus, also a search for a new idiom.[182] Anthropocenic disruption provides opportunity for a classic "third place." But it is an opportunity—or rather an inherited and daunting task—for only the "last generations of human modernity,"[183] namely, our (law) students of today and of the very few next decades. They *must* learn to "intrapreneur" and institute a resilient, "new-old" and "analog" bricolage for organizing, living, and maintaining pervasive forms, theories, and techniques of Anthropocenic community ecology[184]—and to, thereby, re-engineer, from the middle out, an overall sociosphere in which the "net return" of all human activity to social capital and to nature's ability to replenish (thus, to absorb anthropogenic ecosystem costs) will always exceed the overall rate of socioeconomic "growth."

182. *Cf.* Palsson et al., *supra* note 15, at 7–8 ("Perhaps the most pressing task involves addressing the short-term and medium-term question of how to navigate the transition to a fully Anthropocene society during a period in which the prevailing social values and institutions are still those of an earlier epoch."); Tickell, *supra* note 47, at 926.

> Little is more difficult than learning to think differently. Yet, it is hard even to define the principal problems without upsetting longstanding traditions, beliefs, attitudes and the often unspoken assumptions on which we build our lives. It took a long time for previous generations to accept the antiquity of the Earth, the mechanisms of evolution, the movement of tectonic plates, the shared genetic inheritance of all living organisms, and the symbiotic and to some extent self-regulating relationship between the physical, chemical, biological and human components of the Earth system. Some still reject the whole idea.

*Id.* (internal reference omitted).

183. *Cf.* Chen, *supra* note 4, at 770 (alteration in original) (emphasis added) (quoting Isaac Asimov, *Founding Father*, *in* THEMES IN SCIENCE FICTION: A JOURNEY INTO WONDER 76, 81 (Leo P. Kelley ed., 1972)) ("In humanity's new and *final* chapter, we may yet lie 'down to die in the midst of [our] victory.'").

184. *Cf.* Angela P. Harris, *The Treadmill and the Contract: A Classcrits Guide to the Anthropocene*, 5 TENN. J. RACE GENDER & SOC. JUST. 1, 35 (2016) ("The goal is to trouble and query the very terms in which we have been accustomed to think. . . . We need new metaphors, practices, and institutions if human life is to continue in the Anthropocene.").