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Why Aim Law Toward Human Survival

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Why Aim Law Toward Human Survival

John William Draper*

ABSTRACT

Our legal system is contributing to humanity's demise by failing to take account of our species' situation. For example, in some cases law works against life and supports interests such as liberty or profit maximization.

If we do not act, science tells us that humanity bears a significant (and growing) risk of catastrophic failure. The significant risk inherent in the status quo is unacceptable and requires a response. We must act. It is getting hotter. When we decide to act, we need to make the right choice.

There is no better choice. You and all your relatives have rights. The basic ones are life, liberty, and property. These secular rights apply to each of us and to all of us equally. At least they should. In any event, life comes first, both individually and collectively—for without life, we have no other rights. A collective life failure destroys all individual rights.

We need to re-aim our systems from profit and wealth maximization toward supporting a longer life for the human species. Here is why: We are killing our planetary life support system. System failure kills our unique species, life as we know it, and all other rights. We are well on our way.

This paper can neither begin to provide all the troubling details, nor should it. Looking down into the abyss of failure is unlikely to help. Instead of fighting a growing multiplicity of confusing and sometimes contradictory problems, we should aim ourselves in the opposite direction, away from failure and collapse—and toward the survival of our species.

One key means to do this is with law which provides systems of control and enforcement of limits. We need to use law to structure and control the human system toward success. Instead of attempting to avoid death and collapse, we need to aim humanity toward a longer duration. Doing so will help structure our thinking and our laws, better protecting the rights of all. We need to engineer and aim law toward the survival of the human species and the life support system upon which we depend.

* Reference Librarian (Retired), Biddle Law Library, University of Pennsylvania Carey Law School. I dedicate this article to my late friends, Eric Stiffler, Clyde Summers, Harry Reicher, and Howard Lesnick, for their inspiration and encouragement. Thanks to Dean Ted Ruger and Associate Dean Amanda Runyon for generously providing leave time for this project. Thanks also to Elizabeth Pollman, Jean Galbraith, J.B. Ruhl, Steve Ferrey, Mario Morelli, Tess Wilkinson-Ryan, and Mary Draper for review of earlier drafts and suggestions. The author is responsible for all errors.

Such complex global problems we as a species create and thus face cannot possibly have a one-person solution. The enormity of the situation requires that we work together. But if we structure our work, we stand a better chance of success. How can law help with the structure to support a human future? This is a question of philosophy and law.

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WHY AIM LAW TOWARD HUMAN SURVIVAL

When humanity dies off, we lose all our rights. We must protect from

all significant risks of human extinction. This is a case for using law to better protect our rights by focusing on risks and limits, needs and duties, and framing and aiming.

This article makes a case for building legal systems to protect humanity from significant risks. Survival of the species for a longer duration needs to be a priority, and it needs to be built into our legal systems. In the process of aiming systems to protect all people, we find that aiming is a unifying strategy. A new strategy and its systems could be designed to save billions of lives, build a tomorrow, and bring humanity together in a common interest. These are the potential contributions of this Article.

Part I provides an abridged description of several risks to the survival of the human species. Briefly, the risks represent too much consumption, too much pollution, or too large a human population—individually or in combination. A cursory examination reveals numerous significant risks to humanity, including insufficient food supply, fresh-water scarcity in a rising number of locales, pandemics, and massive die-offs of plant and animal populations. In addition to all other risks, we are subject to systemic risks.

Systemic risks include those emanating from our climate system. Climate change is a complicating and exacerbating factor, serving as a multiplier, adding periods of extreme heat, droughts, and wildfires; long-term sea-level rise; and enhanced dangerous storm activity; causing millions of humans now—and within the lives of today’s teens, billions—to seek safety from the effects of those changes. These risks to the survival of our species and its life support system are both foreseeable and significant.

Human civilization, another complex system, is a “house of cards”¹ perched atop an unstable biosystem.² Complex civilizations have failed throughout human history and continue to do so.³ Civilization relies on both the climate system and the planet’s life support system. Failure of either can take us down, especially if combined with other significant risks.

Part II is about global limits and how to respond to them. Humanity has exceeded some global limits for decades and shows no sign of a return. Exceeding the limits too long erodes our life support system. Worse, we lack global systems or laws to protect our species or its life support system.

Part III is risk analysis. To merit attention, risks must be foreseeable and significant. They must be foreseeable in that we can discuss them,

¹ See JOSEPH TAINTER, *THE COLLAPSE OF COMPLEX SOCIETIES* 60 (1988).

² See Hans-Peter Dürr, *Sustainable Use of Energy*, in *BALANCING NATURE AND CIVILIZATION—ALTERNATIVE SUSTAINABILITY PERSPECTIVES FROM PHILOSOPHY TO PRACTICE* 19, 23-24 (Yoshitsugu Hayashi et al. eds., 2020).

³ See JARED DIAMOND, *COLLAPSE: HOW SOCIETIES CHOOSE TO FAIL OR SUCCEED* 143, 149-50, 173-75, 516-17 (2005) (discussing societal failures from environmental problems).

understand them, and analyze them in advance. Risks must also be significant. To be significant, a risk must be both salient (separate and identifiable) and devastating (a risk that ripens into the kind of injury that seriously impairs ordinary life). Suppressing insignificant risks not only wastes precious time and resources, doing so unnecessarily impairs human liberty.

Part IV explores need and duty. What actions are needed? What laws and systems do we need to protect our species? By focusing on individual problems, we will find that some solutions work well until they conflict with solutions to other problems. Conflicting solutions will likely tie our hands by leaving us unable to prioritize our goals and methods. As more “one-off” risks line up around us, we will be unable to keep them all at bay; humanity will be able to peer into the abyss of failure. We must avoid this approach and take duty into account.

Relying on legal philosopher Ronald Dworkin and Austrian psychologist Viktor Frankl, we explore the duty to act. Who bears that legal and moral duty to act? We do. Each of us, no matter our creed, race, or means. We each bear the duty to protect human life. Humanity has created the risks to our species and the planet. It is frightening. We see no help on the way. Waiting makes matters worse. We have a legal duty not to take lives with our actions. We must change our behavior to respect the rights of others to life. Legally, we must act.

Part V discusses the need for a new vision, how to frame that vision, and what to aim for. Extinction is not the answer. Nor is doom something to focus on when trying to escape it. Better to frame a more-positive vision.

Instead of aiming to avoid loss, we need a positive goal. The opposite of extinction is survival. Instead of seeking to avoid death, we need to aim for life. Not just the life of one but the life of all. We need to aim for the survival of the human species and its life support system. We close discussion of re-aiming with a visit to concepts implicit in human survival.

We arrive at the Conclusion. It reveals both the trap for opponents of this theory and the strength of humanity’s unity of purpose and response.

We begin with an abridged review of current risks to human survival.

I. RISKS TO HUMAN SURVIVAL

Is it reasonable to believe that humanity is headed toward collapse? As observed by social and political philosopher, Jean-Pierre Dupuy, “We are living today in the shadow cast by the prospect of catastrophes that, separately or in combination, threaten to bring about the disappearance of

the human race from earth.”⁴ Briefly, the risks humanity faces are a combination of too much consumption, too much pollution, and too large a human population.⁵ Any one of these problems can be sufficient to be lethal to a large group of humans, even, ultimately, the largest group.

This Part is not background material but a statement of the scope and depth of humanity’s legal problem. We face many risks in many categories. Although we may not know all the significant risks or even all the categories, science provides easy windows into several, including insufficient food supply, fresh-water scarcity in a rising number of locales, pandemics, massive die-offs of other species upon which we depend, and the exacerbating factor of climate change. We begin with consumption.

A. Consumption

Madison Avenue’s marketers have long worked to create demand.⁶ As a consequence, we now consume too much.⁷ Our impact is measured by an ecological footprint, a calculation of our consumption.⁸ The Global Footprint Network’s website shows that the U.S. ecological footprint ranks seventh in the world (behind six tiny countries) at 8.1 hectares per person.⁹

⁴ JEAN-PIERRE DUPUY, A SHORT TREATISE ON THE METAPHYSICS OF TSUNAMIS 1 (M.B. DeBevoise, trans., 2015) (2005).

⁵ See DIAMOND, *supra* note 3, at 487-96; DONELLA MEADOWS ET AL., LIMITS TO GROWTH: THE 30-YEAR UPDATE 238-44 (2004) [hereinafter MEADOWS, ET AL., 30-YEAR UPDATE].

⁶ See Douglas B. Ward, *Capitalism, Early Market Research, and the Creation of the American Consumer*, 1 J. HIST. RES. MARKETING 200 (2009).

⁷ E.g., our diets. NYU nutrition professor Marion Nestle explains: “Since the [1970s], the calories in the food supply have gone from 3,200 per person per day to 4,000. That’s twice the amount needed by the average person.” Caitlin Dow, *Against the Odds: Why Our Food System Makes It Tough to Eat Healthy* (interview with Marion Nestle), NUTRITION ACTION HEALTH LETTER, Nov. 2020, at 10. As a result, “[o]besity rates in US adults are projected to increase nationwide by 2030, exceeding 50% in 39 states and adding up to \$66 billion to the price tag of treating obesity-related diseases.” Rebecca Voelker, *Escalating Obesity Rates Pose Health, Budget Threats*, 308(15) JAMA 1514, 1514 (Oct 17, 2012).

⁸ More precisely:

The Ecological Footprint per person is a nation's total Ecological Footprint divided by the total population of the nation. To live within the means of our planet's resources, the world's Ecological Footprint would have to equal the available biocapacity per person on our planet, which is currently 1.7 global hectares. So if a nation's Ecological Footprint per person is 6.8 global hectares, its citizens are demanding four times the resources and wastes that our planet can regenerate and absorb in the atmosphere.

Ecological Footprint per Person, GLOBAL FOOTPRINT NETWORK, <https://data.footprintnetwork.org/#/>.

⁹ For a graphical rendering of worldwide national data from 1961 to 2016, see *id.*

Per person, we use over 4.7 times the resources generated by the planet.¹⁰ We are good consumers. Madison Avenue has done its job well.

The 2020 Living Planet Report from WWF (formerly the World Wildlife Federation) and the Zoological Society of London tells the resulting story of a human footprint that has long outstripped the Earth's capacity for regeneration.¹¹ With a rapidly rising global population, humanity is in an increasing bind to produce enough food. We have two connected problems. First, “[b]iodiversity loss threatens food security and urgent action is needed to address the loss of the biodiversity that feeds the world.”¹² Secondly, “[W]here and how we produce food is one of the biggest human-caused threats to nature and our ecosystems, making the transformation of our global food system more important than ever.”¹³

Our increasing demand for food is merely one of the many problems of humanity's overconsumption.¹⁴ We abuse the land to create more food.¹⁵ We are wasteful.¹⁶ And we have modified our diets to use our supply of available vegetable oils and meat.¹⁷ Unfortunately, these actions cause additional greenhouse gas (GHG) emissions. Meanwhile, “[c]hanges in consumption patterns have contributed to about two billion adults now

¹⁰ For everyone on the planet to use resources at the U.S. level would require almost four more Planet Earths. Sadly, we have made no progress in 20 years. See EDWARD O. WILSON, *THE FUTURE OF LIFE* 23 (2002) [hereinafter WILSON, *FUTURE OF LIFE*].

¹¹ “Until 1970, humanity's Ecological Footprint was smaller than the Earth's rate of regeneration. To feed and fuel our 21st century lifestyles, we are overusing the Earth's biocapacity by at least 56%.” *Executive Summary*, in [WWF & ZSL] *LIVING PLANET REPORT 2020: BENDING THE CURVE OF BIODIVERSITY LOSS* 6 (R.E.A. Almond et al. eds., 2020).

¹² *Id.* at 7.

¹³ *Id.*

¹⁴ Examples of overconsumption include carbon-based fuels and overfishing. See J.R. Toggweiler, *Carbon overconsumption*, 363 *NATURE* 210 (May 20, 1993); Jeremy B. C. Jackson, *Historical Overfishing and the Recent Collapse of Coastal Ecosystems*, 293:5530 *SCIENCE* 629 (Jul. 27, 2001).

¹⁵ “About a quarter of the Earth's ice-free land area is subject to human-induced degradation. Soil erosion from agricultural fields is estimated to be currently 10 to 20 times (no tillage) to more than 100 times (conventional tillage) higher than the soil formation rate.” INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *CLIMATE CHANGE AND LAND: AN IPCC SPECIAL REPORT ON CLIMATE CHANGE, DESERTIFICATION, LAND DEGRADATION, SUSTAINABLE LAND MANAGEMENT, FOOD SECURITY, AND GREENHOUSE GAS FLUXES IN TERRESTRIAL ECOSYSTEMS: SUMMARY FOR POLICY MAKERS* 7 (2020) [hereinafter IPCC, *CLIMATE CHANGE AND LAND*].

¹⁶ “Currently, 25-30% of total food produced is lost or wasted.” *Id.*

¹⁷ “Data available since 1961 shows the per capita supply of vegetable oils and meat has more than doubled and the supply of food calories per capita has increased by about one third.” *Id.*

being overweight or obese.”¹⁸ Nevertheless, hunger remains widespread.¹⁹

At the same time, we must use less water to create food. To adapt, we need to change our food supply. For the unwilling, only failing to adapt could be worse. In a drought, crops can fail. When crops fail repeatedly, a civilization can collapse.²⁰ Like it or not, in this globalized world we are all part of one enormous human civilization. If we destabilize ourselves with extreme droughts, resultant migrations increase humanity’s risk of failure.

Excessive consumption can destroy resources rather than allow regeneration (of e.g., soils or fisheries) needed for the longer term. Our use of lands and waters destroys natural habitats,²¹ destroys wild food sources,²² harms biodiversity,²³ and causes soil damage and erosion.²⁴

Unfortunately, through neo-classical economic theory, consumption growth is viewed positively. Satisfaction is all about the money. Maximum profit or income is the goal, even a duty, without regard to externalities.²⁵ Some externalities then harm people with rights.²⁶ Materialism and

¹⁸ *Id.*

¹⁹ “[A]bout 2 billion people in the world experience moderate or severe food insecurity.” U.N. Food & Agric. Org., *The State of Food Security and Nutrition in the World: Safeguarding against Economic Slowdowns and Downturns* (2019), at vii, <http://www.fao.org/3/ca5162en/ca5162en.pdf>.

²⁰ See Nicholas P. Evans et al., *Quantification of Drought during the Collapse of the Classic Maya Civilization*, 361 *SCIENCE* 498 (2018).

²¹ See DIAMOND, *COLLAPSE*, *supra* note 3, at 487–88.

²² See *id.* at 488.

²³ See *id.* at 488–89.

²⁴ See *id.* at 489–90.

²⁵ *Externality*, defined: “the uncompensated impact on the well-being of a bystander.” N. GREGORY MANKEW, *PRINCIPLES OF ECONOMICS, Glossary*, 811, 813 (8th ed. 2018).

²⁶ Externalities can take statistical lives. “‘Cost-benefit’ analysis requires risks to be reduced to the point where the costs of further precautions exceed their benefits. If the marginal costs of eliminating significant risks exceed the marginal benefits, significant risks will continue to exist.” Gregory C. Keating, *Pressing Precaution beyond the Point of Cost-Justification*, 56 *VAND. L. REV.* 653, 684–85 (2003). To measure most accurately the costs and the benefits and arrive at the most efficient result, everything must be placed in dollar terms, even life and health. See FRANK ACKERMAN & LISA HEINZERLING, *PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING* 1-2, 8-9 (2004) [hereinafter ACKERMAN & HEINZERLING, *PRICELESS*]. The cost is calculated *before* early deaths occur; deaths will follow. John William Draper, *Why Law Now Needs to Control Rather than Follow Neo-Classical Economics*, 33 *PACE ENVTL. L. REV.* 157, 202 (2016) [hereinafter Draper, *Neo-Classical Economics*].

Originator of the term *externality*, A.C. Pigou, viewed externalities largely as market failures. CARL CIRCO, *Does Sustainability Require a New Theory of Property Rights?*, 58 *U. KAN. L. REV.* 91, 116 (2009). According to Pigou, externalities should be solved with “government intervention in the form of taxes, subsidies, and regulation.” STEVEN SHAVELL, *FOUNDATIONS OF ECONOMIC ANALYSIS OF LAW* 108 (2004). Those failures that

immorality are merely symptoms of self-interest²⁷ built into the system's structures, behavior, and training (i.e., advertising) to support it all by imploring us to use more and by measuring our behavior.

The result is our "throwaway society."²⁸ Why do we overconsume? John McCollough's empirical study points to convenience and conspicuous consumption,²⁹ interests that cannot possibly justify the taking of life.³⁰

Convenience means that it is often cheaper to replace something than to fix it. Time is money; environmental damage is a mere externality that either has not been factored into our economic decision-making (the problem of social cost) or is merely compensated with money.³¹

Conspicuous consumption includes fashion obsolescence.³² Selling more is more profitable, and together with planned obsolescence, profit maximization plays a role in our drive to consume. This choice has been encouraged by the short-term profit motive of the next quarterly report.³³

involve pollution often affect life and health. The resulting statistics are real people. See CARL F. CRANOR, *LEGALLY POISONED: HOW THE LAW PUTS US AT RISK FROM TOXICANTS* 47 (2011). As a result of an inversion of rights, profit and liberty have displaced the lives of some, say cancer and dementia victims. See John William Draper, *Preserving Life by Ranking Rights*, 82 ALB. L. REV. 157, 206 (2018/2019) [hereinafter, Draper, *Ranking Rights*]. Nonetheless, many externalities (e.g., pollution) seem unsolvable. See Cass R. Sunstein, *Incommensurability and Valuation in Law*, 92 MICH. L. REV. 779, 814 (1994).

²⁷ Self-interest is one of the two characteristics of the neoclassical model's theory of the person: (1) people are rational, and (2) people are self-interested. John Mixon, *Neoclassical Economics and the Erosion of Middle-Class Values: An Explanation for Economic Collapse*, 24 NOTRE DAME J.L. ETHICS & PUB. POL'Y 327, 328 (2011).

²⁸ "The term [throw-away society] describes a critical view of overconsumption and excessive production of short-lived or disposable items over durable goods that can be repaired." *Throwaway Society*, https://en.wikipedia.org/wiki/Throw-away_society (last visited July 11, 2021). Economist John McCollough distills the history for us:

America has been known as a throwaway society since the 1960's. In the 1920's America started to slowly transition into a throwaway society. At this time, many throwaway products, such as disposable paper towels, were marketed as having hygienic qualities. But over time, the disposable products were marketed also for their time saving, convenience qualities. Prior to that time, American households repaired and reused almost all household products.

John McCollough, *The Impact of Consumers' Time Constraint and Conspicuous Consumption Behaviour on the Throwaway Society*, 44 INT'L J. CONSUMER STUD. 33, 33 (2020).

²⁹ See McCollough, *supra* note 28, at 33-34.

³⁰ See Draper, *Ranking Rights*, *supra* note 26, at 173.

³¹ See A. W. Brian Simpson, *Coase v. Pigou Reexamined*, 25 J. LEGAL STUD. 53, 58 (1996); Gerard van der Laan & Nigel Moes, *Collective Decision Making in an International River Pollution Model*, 29 NAT. RES. MODELING 374, 376 (2016).

³² See McCollough, *supra* note 28, at 41.

³³ See Lynne Dallas, *Short-Termism, the Financial Crisis, and Corporate Governance*, 37 J. CORP. L. 264, 267, 277 (2011). But see Mark J. Roe, *Stock Market Short-Termism's*

We consume all kinds of things, even land. Consider agriculture. We have long transformed wild habitats to other uses. As our global population approaches 8 billion³⁴ and rises rapidly,³⁵ we have gone too far.

The resulting extinction crisis³⁶ affects the entirety of nature. All manner of bees, birds, trees, and other fauna and flora need a safe and healthy place to live and to support human life. But the biosphere of the Earth, within which humanity developed,³⁷ is dying. For example, species of amphibians, especially frogs — “nature’s canary in the mine”³⁸ — have long been dying off.³⁹ Not just a few. Species of mammals, birds, reptiles, fish, invertebrates, and plants are disappearing.⁴⁰ A recent UN report compiled by 145 expert authors from 50 countries stresses that natural resources are declining at rates unmatched in human history and that the rate of extinction is increasing.⁴¹ As extinctions multiply, humanity can foreseeably be caught in an extinction avalanche.⁴² We head toward failure.

The human activities at the root of this crisis are both direct and indirect. Direct activities include the clearing of forest and other wild lands for housing, roads, and food production.

Indirect habitat destruction occurs through climate change. Although we will revisit climate change, here we see its impact on habitats: “Global warming has led to shifts of climate zones in many world regions, including expansion of arid climate zones and contraction of polar climate zones. As a consequence, many plant and animal species have experienced changes in

Impact, 167 U. PA. L. REV. 71, 113-14 (2018).

³⁴ *Current World Population*, WORLDOMETER, <https://www.worldometers.info/world-population/>.

³⁵ In July 2021, our global ratio of births to deaths remained over two to one. *Id.*

³⁶ See ELIZABETH KOLBERT, *THE SIXTH EXTINCTION: AN UNNATURAL HISTORY* 268-69 (2014) (“Right now, in the amazing moment that to us counts as the present, we are deciding, without quite meaning to, which evolutionary pathways will remain open and which will forever be closed. No other creature has ever managed this, and it will, unfortunately, be our most enduring legacy.”).

³⁷ See *Humanity Needs a Biosphere*, in EDWARD O WILSON, *HALF-EARTH: OUR PLANET’S FIGHT FOR LIFE* 11-17 (2016) [hereinafter WILSON, *HALF-EARTH*].

³⁸ WILSON, *FUTURE OF LIFE*, *supra* note 10, at 56.

³⁹ See *id.* at 54-56.

⁴⁰ See Lorenzo Brenna, *Animal and plant species declared extinct between 2010 and 2019, the full list*, LIFEGATE (Feb. 11, 2020), <https://www.lifegate.com/extinct-species-list-decade-2010-2019>.

⁴¹ INTERGOVERNMENTAL SCIENCE-POLICY PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVICES, *GLOBAL ASSESSMENT REPORT ON BIODIVERSITY AND ECOSYSTEM SERVICES: SUMMARY FOR POLICYMAKERS* 11 (Sandra Diaz et al. eds., 2019).

⁴² Increasing instability leading to a systemic collapse can appear as an avalanche. See Draper, *Neo-Classical Economics*, *supra* note 26, at 165.

their ranges, abundances, and shifts in their seasonal activities.”⁴³ Changes in ranges and behavior may suffice for some species; others (e.g., trees) are unlikely to be able to migrate successfully.

As climate change increases deserts and non-arable lands,⁴⁴ humanity in turn clears forest to replace lost food production. Destruction of forests, especially rainforests, exacerbates climate change by reducing carbon sinks and oxygen production. Land degradation from climate change is part of a vicious circle.⁴⁵ Failure to modulate the impacts of climate change with careful land management will cause the impacts to spiral upward through a feedback loop of increasing erosion of our life support system.⁴⁶

Forests wither from extreme weather events,⁴⁷ from infestation of introduced species,⁴⁸ from acid rain,⁴⁹ and from land conversion to

⁴³ IPCC, CLIMATE CHANGE AND LAND, *supra* note 15, at 10.

⁴⁴ “In some dryland areas, increased land surface air temperature and evapotranspiration and decreased precipitation amount, in interaction with climate variability and human activities, have contributed to desertification. These areas include Sub-Saharan Africa, parts of East and Central Asia, and Australia.” *Id.* at 6. “Desertification amplifies global warming through the release of CO₂ linked with the decrease in vegetation cover.” *Id.* at 14.

⁴⁵ “Climate change can exacerbate land degradation processes including through increases in rainfall intensity, flooding, drought frequency and severity, heat stress, dry spells, wind, sea-level rise and wave action, and permafrost thaw....” *Id.* at 10.

⁴⁶ A feedback loop is a self-reinforcing aspect of a system. Meadows et al. explain: “When we, systems dynamicists, see a pattern persist in many parts of a system over long periods, we assume that it has causes embedded in the feedback loop structure of the system. Running the same system harder or faster will not change the pattern as long as the structure is not revised.” MEADOWS, ET AL., 30-YEAR UPDATE, *supra* note 5, at 43. They later explain the feedback loop structure. *See id.* at 141-145.

⁴⁷ “A hotter planet is, on net, bad for plant life, which means what is called ‘forest dieback’ ... which means a dramatic stripping-back of the planet’s natural ability to absorb carbon and turn it into oxygen, which means still hotter temperatures, which means more dieback and so on.” DAVID WALLACE-WELLS, THE UNINHABITABLE EARTH: LIFE AFTER WARMING 22 (2019). Wallace-Wells describes the operation of a feedback loop.

⁴⁸ E.g., the emerald ash borer and the spotted lanternfly: *Emerald Ash Borer*, https://en.wikipedia.org/wiki/Emerald_ash_borer (“The emerald ash borer ... is a green ... jewel beetle native to north-eastern Asia that feeds on ash species. ... Outside its native range, it is an invasive species and is highly destructive to ash trees native to Europe and North America.”); *Spotted Lanternfly*, https://en.wikipedia.org/wiki/Spotted_lanternfly (“The spotted lanternfly ... is a planthopper that is indigenous to parts of Southern China, Taiwan, and Vietnam, and has spread invasively to Japan, South Korea, and the United States.” It has “a wide host range of over 70 plant species, including grape vines, fruit trees, ornamental trees, and woody trees....”).

⁴⁹ Acid rain dissolves and releases aluminum and such important nutrients as calcium, potassium, and magnesium from forest soils. A “combination of reduced calcium and excessive aluminum can make forests more susceptible to pests, disease, and injury from freezing and drought, as a proper balance of these nutrients is vital to forest health.” *Acid*

agricultural and other uses.⁵⁰ In connection with this loss, biodiversity is plunging.⁵¹ As part of a larger statement on climate change, a group of over 11,000 scientists says, “We need to quickly curtail habitat and biodiversity loss . . . , protecting the remaining primary and intact forests, especially those with high carbon stores and other forests with the capacity to rapidly sequester carbon (proforestation), while increasing reforestation and afforestation where appropriate at enormous scales.”⁵²

As we develop or open human access to more lands, including forest lands, humanity is doing the opposite. Wild habitats and the species that live in them are on course to fall. We are destroying our commons.⁵³ According to Harvard’s Edward O. Wilson, “Unless humanity learns a great deal more about global biodiversity and moves quickly to protect it, we will soon lose most of the species composing life on Earth.”⁵⁴

Remember the clean water each of us needs to live. We memorialized that need with the Clean Water Act of 1972.⁵⁵ Use and efficiency vary by how much we pay.⁵⁶ We need clean water for more than drink. Food production uses most of our water.⁵⁷ But water shortages over vast areas of land make food production increasingly difficult.⁵⁸

Excessive consumption, encouraged by a variety of systems and incentives, can be proven rational,⁵⁹ but consumption itself is not the only problem. The inefficiencies of production, processing, and distribution,

Rain, USGS, <https://www.usgs.gov/mission-areas/water-resources/science/acid-rain> (last visited, July 11, 2021).

⁵⁰ See *Forest Conversion*, WWF, https://wwf.panda.org/discover/our_focus/forests_practice/deforestation_causes2/forest_conversion/ (last visited July 11, 2021). Loss of crucial forest resources is not limited to tiny developing countries. Consider Brazil.

⁵¹ “In 2020, the [Living Planet Index] shows an average rate of decline in [wildlife] population size of 68% between 1970 and 2016.” *Executive Summary*, in LIVING PLANET REPORT 2020, *supra* note 11, at 17.

⁵² William J. Ripple et al., *World Scientists’ Warning of a Climate Emergency*, 70 BIOSCIENCE 8, 11 (Jan. 2020), <https://doi.org/10.1093/biosci/biz088>.

⁵³ “The human species at the moment is destroying its own commons.” NOAM CHOMSKY (WITH DAVID BARSAMIAN), GLOBAL DISCONTENTS 28 (2017).

⁵⁴ WILSON, HALF-EARTH, *supra* note 37, at 3.

⁵⁵ The Clean Water Act of 1972 is also known as the Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816.

⁵⁶ See JOEL E. COHEN, HOW MANY PEOPLE CAN THE EARTH SUPPORT? 308 (1995).

⁵⁷ See *id.* at 308-09.

⁵⁸ “The world as a whole is already well into a water crisis. About eighteen countries, home to half the world’s population, are draining their aquifers.” WILSON, HALF-EARTH, *supra* note 37, at 171.

⁵⁹ See Richard E. Romano, *When Excessive Consumption Is Rational*, 81 AM. ECON. REV. 553 (1991).

some of them inherent, add to our waste.⁶⁰ What is thrown away is not “consumed” *per se*. Excessive consumption generates a lot of waste, all forms of gaseous, solid, and liquid waste.⁶¹ Our problem with too much consumption is tied to our problem with too much pollution, which we will discuss next. Fortunately, if we consume less, we will also pollute less.

B. Pollution

Pollution comes in many forms. We pollute our water and air. We will consider each briefly. Pollution sounds bad, but it is merely part of life as each of us generates pollution daily for Earth to absorb and process.⁶² Of course, the more of us there are, the more waste our planet must process.

Water pollution, long treated as a local matter,⁶³ is also a national problem.⁶⁴ It has become a global matter.⁶⁵ Our oceans are full of plastic which harms sea life and collects in massive garbage patches or gyres.⁶⁶

⁶⁰ A waste stream analysis of a community food system (40 % of waste) and its consumers (60 %) showed that production waste was 20 % of the total. Mary Griffin et al., *An Analysis of a Community Food Waste Stream*, 26 AGRIC. HUM. VALUES 67 (2009). Percentages vary by activity and by technology. For example, in 1997 the manufacture of the typical desktop computer (composed of 55 pounds of plastic, metal, glass, and silicon) generated 139 pounds of waste, 49 pounds of which was hazardous. JOHN C. RYAN & ALAN THEIN DURNING, *STUFF: THE SECRET LIVES OF EVERYDAY THINGS* 45-46 (1997).

⁶¹ See WASTE GAS TREATMENT FOR RESOURCE RECOVERY (Piet N.L. Lens et al., eds. 2006); SILPA KAZA, *DECISION MAKER'S GUIDES FOR SOLID WASTE MANAGEMENT TECHNOLOGIES* (WORLD BANK, 2019); ROBERT W. PIERSON, JR. & JOACHIM TOURBIER, *BIOLOGICAL CONTROL OF WATER POLLUTION* (2016). There is a literature on efforts to reduce and reuse that waste. See KATE O'NEILL, *WASTE* (2019).

⁶² See ROSE GEORGE, *THE BIG NECESSITY: THE UNMENTIONABLE WORLD OF HUMAN WASTE AND WHY IT MATTERS* (2008).

⁶³ News accounts often refer to the local nature of water pollution. See e.g., Justine McDaniel & Laura McCrystal, *A Dozen Homes in Bucks County are Confronting Their Own Water Contaminant Crisis. And not because of military bases*, PHILA. INQUIRER (July 14, 2019), <https://www.inquirer.com/news/pfas-dep-water-contamination-east-rockhill-west-bucks-county-20190714.html>. We have an evolutionary basis for an inherited preference for local risk. See Yuval Heller & Arthur Robson, *Evolution, Heritable Risk and Skewness Loving*, 16 THEORETICAL ECON. 403 (2021).

⁶⁴ See Charles Duhigg et al., *What's in Your Water*, N.Y. TIMES (May 16, 2012), <https://www.nytimes.com/interactive/projects/toxic-waters/contaminants/index.html>.

⁶⁵ The global nature of pollution is especially evident when we consider the air and the oceans. Even on land, water pollution can travel long distances via rivers, aquifers, and even in our seafood. The pollution of rivers creates international issues. See *Pollution in Chinese River Reaches Russian Territory*, VOICE OF AMERICA (October 30, 2009, 08:42 AM), <https://www.voanews.com/archive/pollution-chinese-river-reaches-russian-territory>.

⁶⁶ Ocean plastics harm sea life. HOWARD DRYDEN & DIANE DUNCAN, *PLASTIC AND CHEMICALS TOXIC TO PLANKTON WILL ACCELERATE OCEAN ACIDIFICATION WHICH COULD*

River deltas are dead zones from agricultural runoff.⁶⁷ Some dead zones are as large as a US state.⁶⁸ They have existed for decades as the EPA has not regulated agricultural pollution.⁶⁹ If humanity, through feeding itself or by any other endeavor, ruins its waters and the life that those waters support, how will we live?

The discharge of toxins can come from industrial activity. For example, the burning of coal releases significant amounts of mercury into the air.⁷⁰ Much of that mercury condenses into water, either directly into an ocean or by collecting there from freshwater runoff. Sea life absorbs it, and the toxin concentrates as it works its way up the food chain. Thus, Inuit, who live far from industrial pollution sources, suffer serious health effects.⁷¹

Ocean pollution ranges from barrels of toxic sludge⁷² to denim particles from washing machine discharges⁷³ to tiny plastic beads (nurdles).⁷⁴ More

DEVASTATE HUMANITY IN 25 YEARS UNLESS WE STOP THE POLLUTION (GOES Found., July 2021), <https://ssrn.com/abstract=3860950>; SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY AND THE SCIENTIFIC AND TECHNICAL ADVISORY PANEL—GEF, IMPACTS OF MARINE DEBRIS ON BIODIVERSITY: CURRENT STATUS AND POTENTIAL SOLUTIONS 9 (2012), <https://www.cbd.int/doc/publications/cbd-ts-67-en.pdf>. There are at least five garbage patches, gyres where objects reaching an ocean accumulate. Sarah Blumert, *Biggest Ocean Garbage Patches in the World*, RANKER (Sept. 10, 2018), <https://www.ranker.com/list/worlds-biggest-ocean-garbage-patches/sarah-blumert>.

⁶⁷ See Melanie J. Wender, *Goodbye Family Farms and Hello Agribusiness: The Story of How Agricultural Policy is Destroying the Family Farm and the Environment*, 22 VILL. ENVTL. L.J. 141, 156 (2011).

⁶⁸ The Mississippi River's dead zone, reduced in 2020 by about seventy percent due to storms, nevertheless is nearly the size of Delaware. La. St. Univ., *Gulf of Mexico 'Dead Zone' smaller-than-average this summer due to storms*, PHYS.ORG (Aug. 12, 2020), <https://phys.org/news/2020-08-gulf-mexico-dead-zone-smaller-than-average.html>.

⁶⁹ Failure to regulate nonpoint agricultural pollution threatens drinking water nationwide. See Margot J. Pollans, *Drinking Water Protection and Agricultural Exceptionalism*, 77 OHIO ST. L.J. 1195 1199 (2016).

⁷⁰ “Coal plants are responsible for 42 percent of US mercury emissions.” *Coal and Air Pollution*, UNION CONCERNED SCIENTISTS (Dec, 19, 2017), <https://www.ucsusa.org/resources/coal-and-air-pollution>. Mercury is “a toxic heavy metal that can damage the nervous, digestive, and immune systems, and is a serious threat to child development. Just 1/70th of a teaspoon of mercury deposited on a 25-acre lake can make the fish unsafe to eat.” *Id.*

⁷¹ Greenland and Siberian Inuit have world's highest blood levels of mercury and other toxic industrial chemicals. See DIAMOND, *supra* note 3, at 518. Eating high on the food chain concentrates toxins, a process called bioaccumulation. *Life on the Food Chain*, N. ARIZ. U., https://www2.nau.edu/lrm22/lessons/food_chain/food_chain.html (last viewed, July 11, 2021).

⁷² See Divina Ramirez, *Scientists Discover Massive Dumping Ground for Toxic DDT Pesticide Just Off LA Coast*, ECOLOGY NEWS (Nov. 11, 2020), <https://ecology.news/2020-11-11-la-coast-dumping-ground-for-pesticides.html>.

⁷³ See Samantha N. Athey et al., *The Widespread Environmental Footprint of Indigo*

insidiously, plastics, blowing into our lungs at the beach,⁷⁵ may threaten one of humanity's prime sources of oxygen.⁷⁶ All forms of freshwater pollution, from mine tailings⁷⁷ to agricultural runoff⁷⁸ to condensed mercury (from forest fires and air pollution)⁷⁹ to plastic bottles and other debris⁸⁰ find that oceans are inevitably downstream.

Entire books are written on aspects of water pollution. The same goes for air pollution. My point here is that it is all deadly, especially as it accumulates over increasing time frames, and the risks combine but also have synergies. Risk is not just a matter of potential. People are dying.⁸¹ We see this in rates of cancer,⁸² lung disease,⁸³ and neurological

Denim Microfibers from Blue Jeans, 7 ENV'T SCI. & TECH. LETTERS 840 (2020); Matt Simon, *Your Beloved Blue Jeans Are Polluting the Ocean—Big Time*, WIRED (Sept. 2, 2020, 08:00 AM), <https://www.wired.com/story/your-blue-jeans-are-polluting-the-ocean/>.

⁷⁴ “Nurdles can be so noxious that people cleaning beaches or recording pellets in scientific surveys are advised not to touch them with their bare skin – which makes sun bathing on many beaches in the summer an unattractive prospect.” Claire Gwinnett, *Our Oceans Are Full of Nurdles, And They're Not as Cute as They Sound*, SCIENCE ALERT (Feb. 15, 2019), <https://www.sciencealert.com/our-oceans-are-full-of-nurdles-and-they-re-not-as-cute-as-they-sound>. “It's estimated that up to 53 billion nurdles are released annually in the UK from the plastic industry.” *Id.*

⁷⁵ Matt Simon, *That Fresh Sea Breeze You Breathe May Be Laced With Microplastic*, WIRED (May 12, 2020, 02:00 PM), <https://www.wired.com/story/sea-breeze-microplastic/> (“Researchers have discovered that the ocean is burping tiny plastic particles, which then blow onto land—and potentially into your lungs.”).

⁷⁶ “The toxins the material leaches into seawater inhibit the growth and photosynthetic efficiency of the bacteria *Prochlorococcus*, which is responsible for producing an estimated 20 percent of the oxygen we breathe.” Matt Simon, *Now Ocean Plastics Could Be Killing Oxygen-Making Bacteria*, WIRED (May 17, 2019), <https://www.wired.com/story/ocean-plastics-bacteria/>. See Sasha G. Tetu et al., *Plastic leachates impair growth and oxygen production in *Prochlorococcus*, the ocean's most abundant photosynthetic bacteria*, 2 COMM. BIOLOGY 184 (2019).

⁷⁷ See David Kossoff et al., *Mine Tailings Dams: Characteristics, Failure, Environmental Impacts, and Remediation*, 51 APPLIED GEOCHEMISTRY 229 (2014).

⁷⁸ See Robert L. Kellogg et al., *Environmental Indicators of Pesticide Leaching and Runoff from Farm Fields*, NRCS, USDA (Feb. 2000), https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/?cid=nrcs143_014053.

⁷⁹ *Basic Information about Mercury*, EPA, <https://www.epa.gov/mercury/basic-information-about-mercury> (last visited July 11, 2021).

⁸⁰ Plastic debris accumulates quickly. Laurent Lebreton et al., *Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic*, 8 SCI. REPORTS, Art. No. 4666 (2018), <https://www.nature.com/articles/s41598-018-22939-w>.

⁸¹ See Keating, *supra* note 26, at 694–95.

⁸² See CDC: *U.S. Deaths from Heart Disease, Cancer on the Rise*, AM. HEART ASS'N (Aug. 4, 2016), <http://www.heart.org/en/news/2018/05/01/cdc-us-deaths-from-heart-disease-cancer-on-the-rise>.

⁸³ “While the risk [of chronic respiratory illness] was pegged at 41 deaths for every

disorders.⁸⁴

Air pollution is composed of particulates and gasses. Historically, government regulated particulates first,⁸⁵ probably because we could see them. Downwind was long the answer to emission problems. Building a taller smokestack moved smoke from the immediate area of the plant.⁸⁶

However, current technology allows us to trace plumes of smoke around the globe.⁸⁷ Pollution is now global. There is no escaping it. Even for particulates now, everyone is downwind. There is a clear linkage between pollution and child mortality.⁸⁸ Neither adulthood nor distance provide immunity.⁸⁹ Thus, we all bear some risk.

Gas pollution can come from toxic chemicals and even from inert gasses in quantities sufficient to overwhelm Earth's absorptive capacities. GHGs represent a global, not just local, challenge. We must stop them globally as well as locally. As we cannot see GHGs, it has been easier to ignore them.

Carbon dioxide and methane are the most pernicious GHGs; they cause climate change.⁹⁰ We will return to climate change shortly. Climate change is a damage multiplier, adding periods of increasingly extreme heat,

100,000 people back in 1980, it rose to nearly 53 out of every 100,000 by 2014, representing a nearly 31 percent spike over 35 years." Alan Mozes, *Respiratory Disease Death Rates Have Soared*, WEBMD (Sept. 29, 2017), <https://www.webmd.com/lung/copd/news/20170929/respiratory-disease-death-rates-have-soared>.

⁸⁴ See WORLD HEALTH ORG., NEUROLOGICAL DISORDERS: PUBLIC HEALTH CHALLENGES 35 tbl.2.7 (2006).

⁸⁵ See Meeting Notice, 32 Fed. Reg. 19,197 (Dec. 20, 1967). It would be 40 years before *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007) forced the EPA to regulate carbon dioxide and other GHGs as pollutants.

⁸⁶ See CONRAD L. STANITSKI, CHEMISTRY IN CONTEXT: APPLYING CHEMISTRY TO SOCIETY 256 (1999).

⁸⁷ "Smoke from the bushfires that ravaged Australia in December and January continues to circle the globe almost four months after it was formed." DPA, *Australian Bushfire Smoke Plume Still Drifting Around the World*, THE AGE (Apr. 23, 2020, 3:23pm), <https://www.theage.com.au/national/australian-bushfire-smoke-plume-still-drifting-around-the-world-20200423-p54mn1.html>. Chinese pollution has offset 43 percent of efforts to reduce ozone in the Western United States. See Willem W. Verstraeten et al., *Rapid Increases in Tropospheric Ozone Production and Export from China*, 8 NATURE GEOSCIENCE 690 (2015).

⁸⁸ See Brian Beach & W. Walker Hanlon, *Coal Smoke and Mortality in an Early Industrial Economy* 128:615 ECON. J. 2652 (2018).

⁸⁹ See *Adults and Lead Poisoning*, NYC HEALTH, <https://www1.nyc.gov/site/doh/health/health-topics/lead-poisoning-adults-and-lead-poisoning.page>; Tony Barboza, *Freeway Pollution Travels Farther Than We Thought. Here's How to Protect Yourself*, L.A. TIMES (Dec. 30, 2017), <https://www.latimes.com/local/california/la-me-freeway-pollution-what-you-can-do-20171230-htlmlstory.html>.

⁹⁰ See Steven Ferrey, *The Second Element, First Priority*, 24 B.U. J. SCI. & TECH. L. 41, 43 (2018).

leading to long-term sea-level rise, to enhanced dangerous storm activity, and to hundreds of millions of migrants seeking escape from the effects of those changes. This brings us to the matter of human population.

C. Population

Both consumption and pollution depend, to some degree, on population. Our global population is approaching 8 billion, but the long-term capacity of the planet has been estimated to be about five billion.⁹¹ As the seas rise and the climate scorches productive lands, one should expect the Earth's carrying capacity to drop by hundreds of millions.

Feeding eight billion is already damaging our remaining ecosystems.⁹² The biodiversity into which our species was born is disappearing.⁹³ Problematically, our food systems rely on that biodiversity.⁹⁴

With a rising population (fast in some places), we find ourselves in the uncomfortable position of needing to explore fair and equitable longer-term approaches to global population control and even reduction. At the same time, we need to protect the rights to life and health⁹⁵ for all. Humanity is in a bind, and the size of our population is a major part of the problem.

⁹¹ An expert assessment by Joel Cohen, professor of demography at Rockefeller and Columbia Universities, "estimates that if we want to support individuals indefinitely—allotting each person 3,500 calories per day from wheat and 247,000 gallons per year of fresh water—the planet has room for only about 5 billion people." Wired Staff, *Earth Hurtles toward 6.5 Billion*, WIRED (Feb. 21, 2006, 02:00 AM), <https://www.wired.com/2006/02/earth-hurtles-toward-6-5-billion/>. Although that may seem like quite a lot of water per person, remember that the greatest amount of water we use per person goes to food production. See COHEN, *supra* note 56, at 308.

⁹² For example, viewed since 1700, "[t]here has been a much (3.7 times) faster rate of wetland loss during the 20th and early 21st centuries, with a loss of 64–71% of wetlands since 1900 AD." Nick C. Davidson, *How much wetland has the world lost? Long-term and recent trends in global wetland area*, 65 MARINE & FRESHWATER RES. 934 (2014). I am aware that Malthus and Paul Ehrlich have warned about overtaxing food supplies and the ability to support the Planet, but this is not the same concern as from 40 or more years ago. It is not that the land and environment will not support that much food production, but that we are changing the land and environment to longer function in that mode.

⁹³ "The global Living Planet Index ... shows an average 68% decrease in population sizes of mammals, birds, amphibians, reptiles and fish between 1970 and 2016. A 94% decline in the LPI for the tropical subregions of the Americas is the largest fall observed in any part of the world." *Executive Summary*, in LIVING PLANET REPORT 2020, *supra* note 11, at 6.

⁹⁴ See text, *supra* at notes 12, 13.

⁹⁵ All too quickly, concerns about health equate to life and lives saved or lost. See Lawrence O. Gostin, *Global Health Security in an Era of Explosive Pandemic Potential*. 14 ASIAN J. WTO & INT'L HEALTH L. & POL'Y 267, 270-71 (2019).

Our procreational liberties and incentives, world-over, add to the risk of early collapse and death for all of us. As biologist Wilson puts it, “we must really slow down. Reproduction is obviously necessary, but it is a bad idea, as Pope Francis I has pointed out, to continue multiplying like rabbits.”⁹⁶ Wilson adds that demographic projections show the human population rising “to about eleven billion or slightly more before the end of the century, thereafter peak, and begin to subside.”⁹⁷ The impact of 11 billion humans on planet Earth is a frightening prospect. We lack natural resources to support the current population, let alone another three and a half billion.

Our population is already a major exacerbating factor in meeting our need to live on a healthy and relatively safe planet.⁹⁸ We should quantify our impact. In 2016, Edward O. Wilson reported, “The rate of extinction of species and races is conservatively estimated to be 877 times above that prevailing before the origin of humanity (the latter rate is one extinction every three million years).”⁹⁹ Extinctions from the dodo to the Tasmanian tiger to the Pyrean ibex relate to human activity.¹⁰⁰

Our impact on other species matters: If we kill all the main oxygen makers, what will we breathe? Other species include both plants and animals. Native plants and animals are often displaced by introduced¹⁰¹ species or as habitat gets put to “productive” use, whether that use be housing, agriculture, or industry. The pressures of an expanding human global population—and its footprint—are eliminating and overusing¹⁰² wild

⁹⁶ WILSON, HALF-EARTH, *supra* note 37, at 58.

⁹⁷ *Id.*

⁹⁸ Many cultural systems and economic policies support human population growth. The timing for planet Earth could not be more wrong. We must protect human life. To do so, we must find safe alternatives to the overpopulation of an impoverished planet.

⁹⁹ WILSON, HALF-EARTH, *supra* note 37, at 43.

¹⁰⁰ Wilson provides other examples of human causation:

From 1898 to 2006, according to Noel M. Burkhead of the American Fisheries Society, fifty-seven kinds of freshwater fish declined to extinction in North America. The causes included the damming of rivers and streams, the draining of ponds and lakes, the filling in of springheads, and pollution, all due to human activity.

Id.

¹⁰¹ Introduction may be by intent or by “accident.” See Karrigan Börk, *Guest Species: Rethinking Our Approach to Biodiversity in the Anthropocene*, 2018 UTAH L. REV. 169, 173 (“[M]any human precipitated introductions prove disastrous, and society should not condone most new introductions, intentional or otherwise.”). Accidentally introduced species are not accidents in the true sense; these introductions are entirely predictable. See Peter B. Moyle & Michael P. Marchetti, *Predicting Invasion Success: Freshwater Fishes in California as a Model*, 56 BIOSCIENCE 515, 516 (2006).

¹⁰² Even our national parks are not safe from overuse. Josh Hewitt, *What to do about Overcrowding at National Parks*, WANDERLUST TRAVEL & PHOTOS (Apr. 3, 2019),

spaces. This increases the risk that we may remove one species too many.

There are many “little” species that have been compared to the rivets holding together an airplane. No single rivet is crucial. One can remove a rivet. And another. But soon the airplane will not hold together.¹⁰³ The same goes for the huge collection of species on which we depend, from pollinators to fungi, or the species upon which *they* depend. We need crops to be pollinated, and we need compost to rot. The trouble here is that we have no idea of the damage we are doing to our very own life support system.¹⁰⁴ Growing extinctions represent an existential threat.¹⁰⁵

Human-caused habitat destruction is leading to mass extinctions that increase significant risk to humanity. According to Professor Wilson, there are almost countless ways we are unwittingly destroying the millions of species that benefit humanity directly or indirectly, regardless of “whatever might be their present or future beneficent roles. The human impact is largely due to the excess of the many quotidian activities we perform just to get on with our personal lives. Those activities have made us the most destructive species in the history of life.”¹⁰⁶ As a result, he says, “[A]ll available evidence points to the same two conclusions. First, the Sixth Extinction is underway; and second, human activity is its driving force.”¹⁰⁷ We are systematically exterminating the other species on this planet.

This concern for other species leads back to our own. In the process of completing our dominion over the planet, we are putting our own species at significant risk. As Ronald Dworkin put it,

Our concern for the preservation of animal species reaches its most dramatic and intense form, of course, in the case of one particular

<https://wanderlustphotosblog.com/2019/04/03/what-to-do-about-overcrowding-at-national-parks/> (“[O]vercrowding at the national parks is damaging our parks and leading to significant safety concerns.”).

¹⁰³ See PAUL R. EHRLICH & ANNE H. EHRLICH, *EXTINCTION: THE CAUSES AND CONSEQUENCES OF THE DISAPPEARANCE OF SPECIES*, at xii-xiii (1981).

¹⁰⁴ Wilson explains the deeper significance of the human actions leading to extinctions: There is a deeper meaning and long-term importance of extinction. When these and other species disappear at our hands, we throw away part of Earth’s history. We erase twigs and eventually whole branches of life’s family tree. Because each species is unique, we close the book on scientific knowledge that is important to an unknown degree but is now forever lost.

WILSON, *HALF-EARTH*, *supra* note 37, at 44.

¹⁰⁵ “The ongoing mass extinction of species, and with it the extinction of genes and ecosystems ranks with pandemics, world war, and climate change as among the deadliest threats that humanity has imposed on itself.” *Id.* at 187.

¹⁰⁶ *Id.* at 54.

¹⁰⁷ *Id.* at 55.

species: our own. It is an inarticulate, unchallenged, almost unnoticed, but nevertheless absolute premise of our political and economic planning that the human race must survive and prosper.¹⁰⁸

Our notions of prosperity threaten our survival. This comes into stark view when we consider our own globalization.

A vast and foundational part of global health security is global food security. Without food and the water upon which it depends, we have no way to provide for the hungry billions. Unfortunately, our actions are already placing humanity's food supply at risk.¹⁰⁹ Our ability to feed five billion, let alone the nearly eight billion already on Earth, is slipping away.

There is more to health security than food. COVID-19 makes that clear. Our global population is high, but it is also interconnected. We currently lack an effective system to control or limit global interconnections and the significant risks that go with them. This has special application with introduced species, whether plants, insects, mollusks, or viruses.

There are likely entire categories of risks which we have not yet identified, let alone studied and solved, both on paper and in the real world. The build-out of a system can enable success. The success of South Korea's response to COVID-19 in spring 2020 demonstrates the importance of a system of study, preparation, and cooperation.

We have discussed consumption, pollution, and population. Each or a combination bears risks to humanity, both foreseeable and significant. We move to another category of significant global risk, systemic risk.

D. Systemic Risks

Humanity builds systems ranging from systems of government to electrical systems to economic systems. As humanity has grown, so have

¹⁰⁸ RONALD DWORKIN, *LIFE'S DOMINION: AN ARGUMENT ABOUT ABORTION, EUTHANASIA, AND INDIVIDUAL FREEDOM* 76 (1993).

¹⁰⁹ Climate change has already affected food security due to warming, changing precipitation patterns, and greater frequency of some extreme events. Studies that separate out climate change from other factors affecting crop yields have shown that yields of some crops (e.g., maize and wheat) in many lower-latitude regions have been affected negatively by observed climate changes, while in many higher-latitude regions, yields of some crops (e.g., maize, wheat, and sugar beets) have been affected positively over recent decades. Climate change has resulted in lower animal growth rates and productivity in pastoral systems in Africa.

IPCC, *CLIMATE CHANGE AND LAND*, *supra* note 15, at 10.

our systems. As they become bigger, faster, more powerful and complex, systems are subject to bigger, faster, more powerful and complex failures.¹¹⁰ These risks are both foreseeable and significant.¹¹¹ As law professor J.B. Ruhl points out, “[A]lthough we often compartmentalize social, ecological, and technological systems as distinct, it is becoming difficult to disaggregate them in operation, as automated online systems increasingly run infrastructure systems, expanding infrastructure systems increasingly degrade ecological systems, and degraded ecological systems diminish the resilience of human social and economic systems.”¹¹² Thus, humanity is now subject to global systemic risk.¹¹³

Our civilizations and systems all rely on natural systems, including Earth’s biodiversity and its climate. Failure of such enormous and complex ecological systems can trigger cascade failure in human systems.¹¹⁴ This section examines natural systems at risk of cascade failure from excessive consumption, pollution, and population. They are quickly eroding.

Governing the risks of such failures is both a scientific and a policy challenge.¹¹⁵ Professor Ruhl explains: “The science of cascade failures in social, ecological, and technological systems seeks to understand their causes and behavior and is developing metrics and principles for describing systemic risk, failure propagation, and network resilience.”¹¹⁶ Governments can then “benefit from the techniques and strategies cascade failure science is exploring for modeling, monitoring, event prediction, and event prevention, response, and recovery.”¹¹⁷

Before one can solve a problem, one needs to identify it. The problem of systemic risk lies not in identifying initial triggers so much as locating the overall systemic or structural cause. While the trigger of an initial failure event may seem small and random in isolation,¹¹⁸ the exact elements vary with operating conditions, meaning that the same event in the same system will not always start a cascade failure.¹¹⁹ Earth has an

¹¹⁰ See J.B. Ruhl, *Governing Cascade Failures in Complex Social-Ecological-Technological Systems: Framing Context, Strategies, and Challenges*, 22 VAND. J. ENT. & TECH. L. 407, 439 (2020).

¹¹¹ See discussions *infra* §§ III.A, III.B.

¹¹² Ruhl *supra* note 110, at 411.

¹¹³ See Miguel A. Centeno et al., *The Emergence of Global Systemic Risk*, 41 ANN. REV. SOC. 65 (2015).

¹¹⁴ See Ruhl, *supra* note 110, at 439.

¹¹⁵ See *id.*

¹¹⁶ *Id.* at 439-40.

¹¹⁷ *Id.* at 440.

¹¹⁸ See Raissa M. D’Souza, *Curtailling Cascading Failures*, 358 SCIENCE 860, 860 (2017).

¹¹⁹ See *id.*

interdependent infrastructure,¹²⁰ and we need to beware foreseeable failures.

Next, we visit two categories of significant systemic risks, failure of the biodiversity of Earth's life support system and failure of our climate system.

1. Failure of Earth's Life Support System

The world that we grew up in is dying. Once it is gone, we are entirely on our own, without a life support system or a parachute.¹²¹

According to philosopher Jean-Pierre Dupuy, the systemic risks we face represent a kind of evil.¹²² We seem to be thoughtlessly wed to our own systemic destruction. But we cannot use self-interest as a tool to attack this systemic evil due to the political impotence of goodness.¹²³

Many of us want to believe that science and technology will bail us out of this "moral disaster,"¹²⁴ but this is a fatal error.¹²⁵ We are on a suicidal

¹²⁰ "Instead of thinking of infrastructure as purely technological artifacts, we instead propose considering infrastructure as linked social, ecological, and technological systems (SETS). Adopting a SETS lens can help identify vulnerabilities that develop within infrastructure systems over time." Samuel A. Markolf et al., *Interdependent Infrastructure as Linked Social, Ecological, and Technological Systems (SETSs) to Address Lock-in and Enhance Resilience*, 6 EARTH'S FUTURE 1638, 1638 (2018).

¹²¹ Harvard Biologist Edward O. Wilson addresses this risk:

A point of no return exists, but it only exists for humanity should we devote too much of the planet's environment to the needs and pleasures of our one species. An Earth packed wall-to-wall with people would be a planetary spaceship, dependent on humanity's future intellect and wisdom for the long-term survival of life. It would not only be disastrous for the rest of life but high risk for our own long-term survival.

WILSON, *HALF-EARTH*, *supra* note 37, at 133-34. Spacecraft have built-in redundancies to protect against total cascade failures of their life support systems. Earth is like a large spacecraft. We must protect its life support system for our own survival.

¹²² Like the great moral catastrophes of the twentieth century, the apocalypse that looms before us will be less the result of our malignity, or even of our stupidity, than of our thoughtlessness. If it has the appearance of something fixed and ineluctable, this is not because it is fated to occur; it is because a multitude of decisions of all kinds, the product more of myopia than of malice or selfishness, bring forth a whole lot that hangs over its parts, as it were, and whose menace is generated by a process of self-exteriorization and self-transcendence. This evil is neither moral nor natural. It is a third type, which I call systemic evil.

DUPUY, *supra* note 4, at 58.

¹²³ "Goodness can exist only when it is not perceived, not even by its author; whoever sees himself performing a good work is no longer good...." HANNAH ARENDT, *THE HUMAN CONDITION* 74 (2d ed., 1998).

¹²⁴ DUPUY, *supra* note 4, at 65.

¹²⁵ Dupuy explains:

Anyone who believes that humanity can continue to count on science and

path that will kill the biodiversity that supports life on this planet. We need to change the aim of our systems to achieve a different result.

If we can make the economic transition to a different worldview according to Professor Wilson, “[t]he biosphere and the ten million species that compose it will no longer be treated as a commodity, but as something vastly more important—a mysterious entity still beyond the boundaries of our imagination yet vital to long-term human existence.”¹²⁶

Wilson says Earth’s life support system remains at risk: “We and the rest of life with us are in the middle of a bottleneck of rising population, shrinking resources, and disappearing species. As its stewards, we need to think of our species as being in a race to save the living environment.”¹²⁷ The system can fail. Wilson suggests a way to avoid that risk: “The logical primary goal is to make it through the bottleneck to a better, less perilous existence while carrying through as much of the rest of life as possible.”¹²⁸

The collapse of Earth’s biodiversity is not the only global systemic risk humanity faces. We were already eradicating biodiversity, but now changes in climate systems are enhancing the eradication, risks, and probabilities.

2. Systemic Climate Risk

The Earth’s climate is an enormous natural system, a system of systems. The climate system directly affects our weather and our well-being. Our vision of the future seems obscured by the systemic changes we have already wrought. However, as we cannot know the future, we cannot know how much worse it will get. But we can extrapolate from the past, and we can see the trends. Day after day, year after year, Earth is warming. Many snow-capped mountains are now bare. Glaciers are receding or gone.

Climate change discussions are often about the number of degrees Celsius global mean surface (land and ocean) temperature (GMST) relative

technology to find the solutions to problems created by science and technology, as they have done up to now, does not really believe that the future is real. Because the future is thought to be something that we make ourselves, it is as indeterminate as our free will; and since we invent it, there can be no science of the future. ... The future that comes to pass is the outcome that we will have chosen. But denying that the future is real presents a potentially fatal metaphysical obstacle. For if the future is not real, a future catastrophe is not real either. Confident in our ability to avoid disaster, we do not consider it to be a threat.

Id. at 59. Dupuy argues that our ability to recognize systemic evil can help us break this “vicious circle.” *Id.* Similarly, a new aim or goal may help humanity avoid disaster.

¹²⁶ WILSON, *HALF-EARTH*, *supra* note 37, at 194.

¹²⁷ *Id.* at 205.

¹²⁸ *Id.* at 205-06.

to pre-industrial levels.¹²⁹ David Wallace-Wells notes how easy it is to trivialize the differences between such numbers as two, three, four, or five. We lack a frame of reference for risks with these kinds of thresholds, “but as with world wars or recurrences of cancer, you don’t want to see even one.”¹³⁰ We are already rising past 1.2 degrees GMST of warming.¹³¹

Climate change is another multiplier, beyond population, affecting both risk and damage. GHGs trap the planet’s heat which then affects weather patterns. No single storm can be attributed to global warming; according to Wallace-Wells, they all are.¹³² We have unleashed a growing global risk: “Climate change isn’t something happening here or there but everywhere, and all at once. And unless we choose to halt it, it will never stop.”¹³³

Such changes in weather patterns bring “climate cascades,” some of which are local, and some of which are global.¹³⁴ Climate cascades are especially likely to occur through the operation of “feedback loops,” which reinforce the operation, erosion, and destruction of climate change.¹³⁵

Those cascades have a multiplier effect. When polar icecaps melt, sea level rise will flood Miami, Dhaka, Shanghai, Hong Kong, and a hundred other cities around the world.¹³⁶ Many huge risks are well known.

What is the holdup? Why is humanity not reducing the risk? Many are caught by our innate self-interest enhanced by a neo-classical economic philosophy that is baked into the global market system. That philosophy espouses profit or wealth maximization as an ideal—on one side.

a. The Behavioral Challenge

An alternative view, on the other side, calls for system-level actions and changes to entrenched systems. Until systems change, some may have little reason to change behavior. When it comes to acting on climate change, we

¹²⁹ See IPCC, CLIMATE CHANGE AND LAND, *supra* note 15, at 9.

¹³⁰ WALLACE-WELLS, *supra* note 47, at 12.

¹³¹ See Andrew Freedman, *Pace of Climate Change Shown in New Report Has Humanity on ‘Suicidal’ Path, U.N. Leader Warns*, WASH. POST (Dec. 2, 2020), <https://www.washingtonpost.com/weather/2020/12/02/un-climate-report-2020-warmest-year/>.

¹³² “All hurricanes now unfold in the weather systems we have wrecked on their behalf, which is why there are more of them, and why they are stronger.” WALLACE-WELLS, *supra* note 47, at 20.

¹³³ *Id.*

¹³⁴ Wallace-Wells gives examples of “climate cascades.” *Id.* at 21-25. Here is one: “A warming planet will also melt Arctic permafrost, which contains 1.8 trillion tons of carbon, more than twice as much as is currently suspended in the earth’s atmosphere....” *Id.* at 22.

¹³⁵ *Id.* at 22, 46.

¹³⁶ See *id.* at 11.

are controlled by such near-term and normal concerns as jobs and health. Operating outside the system bears significant risks. Thus, while the climate situation deteriorates, many of us wait in hope of a systemic change.

The human system requires modification.¹³⁷ We know what to do, but lack the means. We face global problems requiring global changes in behavior. But governmental systems are not set up to deal with these kinds of problems. Nevertheless, we must change global behavior now. We have *one last chance* to avoid climate disaster.¹³⁸ That chance will require “unprecedented global cooperation.”¹³⁹ Like a pandemic, if climate change gets out of control, we are in big trouble.

How we treat climate change in the law depends on how we view its probabilistic causation.¹⁴⁰ If we see a probability that warming is a natural and random occurrence, we tend to favor inaction. While those who see the probability that climate change is anthropogenically-caused tend to want to treat that probabilistic causation as an urgent legal problem. By necessity we are using notions of probabilistic causation to call for law. Further, we will likely need to use calculations of probabilistic causation to build the law and the rules of a protective response.

Science has an answer about which view to take. It says that the odds are overwhelming that humanity has caused the warming of the Earth and the ensuing climate changes. We can only operate in this realm based on prediction of future classes of effects that fall more into the areas of social science and medical research.¹⁴¹ Failing to take the probabilities of

¹³⁷ Wallace-Wells captures climate change’s significant new challenge: “[C]limate change ... is not just the biggest threat human life on the planet has ever faced but a threat of an entirely different category and scale. That is, the scale of human life itself.” WALLACE-WELLS, *supra* note 47, at 7.

¹³⁸ Note the cover headline of a recent issue of Time Magazine: *One Last Chance*. TIME MAG., July 20/27, 2020.

¹³⁹ Marin Wolf, *Last Chance for the Climate Transition: Becoming a civilization that is no longer reliant on fossil fuels requires unprecedented global cooperation*, FIN. TIMES, Feb. 19, 2020, at 9.

¹⁴⁰ See Frederick Schauer & Barbara A. Spellman, *Probabilistic Causation in the Law*, 176 J. INSTITUTIONAL & THEORETICAL ECON. 4 (2020).

¹⁴¹ See *id.* at 8. The “standard story” is that “probabilistic causation is largely for scientific inquiry.” *Id.* at 9. However, by considering the effects of shaken baby syndrome or silicone gel breast implants, we see that “proof of probabilistic causation under the name of general causation is now a widespread phenomenon.” *Id.* at 10. Further, we see that “the increasing use of epidemiological and other general and probabilistic evidence, far from being alien to the idea of law, seems fully compatible with the pervasive and arguably essential generality of law itself and the legal systems that embody it.” *Id.* at 11. This holds true for regulatory law as well: “Underneath the typical regulatory rule, therefore, whether prohibitory or mandatory, is a causal conclusion based on a determination of probabilistic causation.” *Id.* at 12.

causation into account in law- and rule-making is “deeply problematic.”¹⁴²

Carbon is one of the primary causes of climate change. But climate change is caused by humans, and human activity on the ground has long released excessive amounts of carbon.¹⁴³

How we live makes a difference. We cook food. We heat and cool our homes. Most of us live in cities.¹⁴⁴ We travel by car and by airplane. Many of us consume meat and dairy. We see the result on land: “Since the pre-industrial period, the land surface air temperature has risen nearly twice as much as the global average temperature.”¹⁴⁵ Now let us return to food, this time to see how climate change affects what we eat.

b. Food

“Climate change exacerbates land degradation.”¹⁴⁶ Land degradation adversely affects production. As more land degrades, we get less food.

The carbon and its heat not only reduce food production, higher levels of CO₂ also harm food quality. Plants are bigger now but less nutritious.¹⁴⁷ As Wallace-Wells says, “Everything is becoming more like junk food.” Between 1950 and 2004, protein, calcium, iron, and vitamin C have declined in plants by as much as a third. “Even the protein content of bee pollen has dropped by a third.”¹⁴⁸ Researchers looking at the effect on one crop, rice, found that “carbon emissions could imperil the health of 600 million people.”¹⁴⁹ The bottom line for food: there will be more of us, there will be less food, the food will be less nutritious, and we will be hungrier.

Climate change impacts the land itself. Some areas will be more scorched.¹⁵⁰ Some are already affected; consider the Middle East.¹⁵¹

¹⁴² *Id.* at 15.

¹⁴³ See WALLACE-WELLS, *supra* note 47, at 3-4.

¹⁴⁴ Both global warming and urbanisation can enhance warming in cities and their surroundings (heat island effect), especially during heat related events, including heat waves. Night-time temperatures are more affected by this effect than daytime temperatures. Increased urbanisation can also intensify extreme rainfall events over the city or downwind of urban areas.

IPCC, CLIMATE CHANGE AND LAND, *supra* note 15, at 14.

¹⁴⁵ *Id.* at 9.

¹⁴⁶ *Id.* at 7.

¹⁴⁷ See Irakli Loladze, *Hidden Shift of the Ionome of Plants Exposed to Elevated CO₂ Depletes Minerals at the Base of Human Nutrition*, 2014 ELIFE 3:e02245 (May 7, 2014), DOI: 10.7554/eLife.02245.

¹⁴⁸ WALLACE-WELLS, *supra* note 47, at 57.

¹⁴⁹ *Id.* at 58.

¹⁵⁰ “Climate change exacerbates land degradation, particularly in low-lying coastal areas, river deltas, drylands, and in permafrost areas.” IPCC, CLIMATE CHANGE AND

This impact on land harms the inhabitants. Those living in degraded or desertified areas are increasingly impacted by climate change.¹⁵² When impacts worsen, billions will be forced to move in search of a new place to reside.¹⁵³ As the acreage of temperate land shrinks and the number of displaced people rises, another emergency looms.

c. Migration

The migration problem is far greater than several million Americans. In 2018, the World Bank offered a 2050 estimate of 143 million just in sub-Saharan Africa, South Asia, and Latin America.¹⁵⁴ “For every fraction of a degree that temperatures increase, these problems will worsen. This is not fearmongering; this is science.”¹⁵⁵ The UN’s International Organization for Migration has projected as many as a billion climate migrants by 2050.¹⁵⁶

What will it be like 50 years from now? What will our children face? By 2070, up to three billion humans will migrate due to extreme temperatures.¹⁵⁷ That does not count migration forced by sea level rise. Are we going to relocate New York City, most of Florida and much of New

LAND, *supra* note 15, at 3.

¹⁵¹ “Over the period 1961-2013, the annual area of drylands in drought has increased, on average by slightly more than 1% per year, with large inter-annual variability. In 2015, about 500 (380-620) million people lived within areas which experienced desertification between the 1980s and 2000s.” *Id.*

¹⁵² *See id.*

¹⁵³ While sea level rise may force 13 million Americans to relocate (*See Sea level rise could reshape the United States, trigger migration inland*, SCIENCE DAILY (Jan. 22, 2020), <https://www.sciencedaily.com/releases/2020/01/200122150021.htm>), food insecurity will force others to migrate. Depending on the pathway humanity chooses, a warming of 2.5°C GMST would bring food supply instabilities leading to sustained global food supply disruptions. *See* IPCC, CLIMATE CHANGE AND LAND, *supra* note 15, at 16 tbl. A (Risks to humans and ecosystems from changes in land-based processes due to climate change).

¹⁵⁴ *See* WORLD BANK, GROUNDSWELL: PREPARING FOR INTERNAL CLIMATE MIGRATION xix (2018), <https://openknowledge.worldbank.org/handle/10986/29461>.

¹⁵⁵ Charlotte Alter et al., *The Conscience [Greta Thunberg]*, TIME, Dec. 23-30, 2019, at 50, 50.

¹⁵⁶ *See* INT’L ORG. FOR MIGRATION, MIGRATION, ENVIRONMENT AND CLIMATE CHANGE: ASSESSING THE EVIDENCE 43 (2009), <https://environmentalmigration.iom.int/migration-environment-and-climate-change-assessing-evidence>. How come? “Losing productive land is driving people to make risky life choices, says UNCCD [[United Nations Convention to Combat Desertification](#)], adding that in rural areas where people depend on scarce productive land resources, land degradation is a driver of forced migration.” Baher Kamal, *Climate Migrants Might Reach One Billion by 2050*, RELIEFWEB, August 21, 2017, <https://reliefweb.int/report/world/climate-migrants-might-reach-one-billion-2050>.

¹⁵⁷ *See* Chi Xu et al., *Future of the Human Climate Niche*, 117(21) PROC. NAT’L ACAD. SCI. 11350-11355 (May 26, 2020).

Jersey? To where? With rising sea levels, there will be fewer and fewer “wheres” to go to and increasing demand for food supplies when there is less land to produce the food. Projections say these concerns will need to be addressed even if we make immediate significant climate progress.

Optimists look for better outcomes with fewer people affected. In the analysis of David Wallace-Wells, “the optimists have never, in the half-century of climate anxiety we’ve already endured, been right.”¹⁵⁸

d. Our Global Health Emergency

However, humanity itself is not the only system at risk. Our bodies are systems. For example, episodes of great rainfall, increasingly common with climate change, harm our health: “Historically, in the United States, more than two-thirds of outbreaks of waterborne disease—illnesses smuggled into humans through algae and bacteria that can produce gastro-intestinal problems—were preceded by unusually intense rainfall, disrupting local water supplies.”¹⁵⁹ Those impacts on our health go beyond the temporary to include lifetime lost earnings.¹⁶⁰ Lost earnings only begin to tell the story.

Even if, as neo-classical economists, we focus on the money, we still have a problem: “Global gross domestic product could plunge by nearly a quarter by the end of the century because of the effects of climate change.”¹⁶¹ That is mild compared to the physical emergency.

There is a physical emergency: “[O]ver 11,000 climate scientists recently warned, clearly and unequivocally that planet Earth is facing a climate emergency.”¹⁶²

¹⁵⁸ WALLACE-WELLS, *supra* note 47, at 8.

¹⁵⁹ *Id.* at 134.

¹⁶⁰ “The effects begin in the womb, and they are universal, with measurable declines in lifetime earnings for every day over 90 degrees during a baby’s nine months in utero.” *Id.*

¹⁶¹ Jack Ewing, *Climate Change Could Blow Up the Economy. Banks Aren’t Ready*, N.Y. TIMES, Jan. 23, 2020, <https://www.nytimes.com/2020/01/23/business/climate-change-central-banks.html>. See Marshall Burke et al., *Global Non-Linear Effect of Temperature on Economic Production*, 527 NATURE 235 (Nov. 12, 2015).

¹⁶² Ripple et al., *supra* note 52, at 8.

As the Alliance of World Scientists, we stand ready to assist decision-makers in a just transition to a sustainable and equitable future. We urge wide-spread use of vital signs, which will better allow policymakers, the private sector, and the public to understand the magnitude of this crisis, track progress, and realign priorities for alleviating climate change. The good news is that such transformative change, with social and economic justice for all, promises far greater human well-being than does business as usual. We believe that the prospects will be greatest if decision-makers and all of humanity promptly

We have known about warming for decades.¹⁶³ Yet suddenly we realize that not only is our only home on fire,¹⁶⁴ it is burning faster than we imagined. To save anything, now is the time. Humanity must act on this type and degree of risk now. We must address foreseeable and significant risks of systemic failure, whether concrete, diffuse,¹⁶⁵ or cascading.

We find ourselves frozen, able only to hope. We see the fires. And we know more warming is coming due to protracted global processes. But change is hard: “if the next 30 years of industrial activity trace the same arc upward as the last 30 years have, whole regions will become unlivable by any standard we have today as soon as the end of the century.”¹⁶⁶

According to Harvard’s Edward O. Wilson, our planet is in a fight for its life.¹⁶⁷ We have made the unthinkable the foreseeable,¹⁶⁸ then the probable. When warming reaches its full reality, we will likely be gone.

We would like to think that the problem will go away if we can only control our carbon emissions. If only climate change were so simple. Unfortunately, there are multiple climate emission gasses.

e. Methane

Consider another GHG: methane. In 2016, Harvard researchers discovered that methane represents a much greater percentage of warming gas than was previously calculated.¹⁶⁹ Hundred-year emissions were used

respond to this warning and declaration of a climate emergency and act to sustain life on planet Earth, our only home.

Id. at 11. “‘To put it simply,’ [U.N. Secretary-General António Guterres] said in a speech at Columbia University, ‘the state of the planet is broken.’” Adding, “[H]umanity is waging war on nature. This is suicidal.” U.N. Sec’y-Gen., *State of the Planet: Special Address by U.N. Secretary-General António Guterres*, YOUTUBE (Dec. 2, 2020), <https://www.youtube.com/watch?v=2BpFFeGK4jU&feature=youtu.be>.

¹⁶³ “[S]cientists from 50 nations met at the First World Climate Conference (in Geneva 1979) and agreed that alarming trends for climate change made it urgently necessary to act.” Ripple, et al., *supra* note 52, at 8.

¹⁶⁴ See Simon Dalby, “Our house is on fire!” *Why Greta Thunberg Infuriates Conservatives*, SALON (Oct. 6, 2019, 8:00 AM), <https://www.salon.com/2019/10/06/our-house-is-on-fire-why-greta-thunberg-infuriates-conservatives/>.

¹⁶⁵ E.g., risks of losing many individual species over time.

¹⁶⁶ WALLACE-WELLS, *supra* note 47, at 15.

¹⁶⁷ See subtitle (OUR PLANET’S FIGHT FOR LIFE) of WILSON, *HALF-EARTH*, *supra* note 37.

¹⁶⁸ “On longer time scales, an even-bleaker outcome is possible, too—the livable planet darkening as it approaches a human dusk.” WALLACE-WELLS, *supra* note 47, at 16.

¹⁶⁹ “Here’s the error: The EPA’s and UNFCCC’s calculation of chemical impact calculates all impacts over 100 years regardless of actual impact; for methane, this arbitrarily and inaccurately dilutes its actual impact in real time, and results

rather than measuring the accumulation of total warming gases over time in the atmosphere. According to law professor Steven Ferrey, “The impact of short-lived chemicals, particularly methane, the second element altering climate, has been miscalculated as if time and intensity do not matter.”¹⁷⁰ Methane traps three to four times as much heat as previously estimated.¹⁷¹ Recalculations¹⁷² provide one breathtaking conclusion: We are out of time.

We must act. Natural gas, the recent solution to our energy problems, is largely methane and natural gas leakage is a significant source of climate methane. A 50% global increase in natural gas demand by 2040 is predicted.¹⁷³ And even if (unrealistically) none of that methane leaks, a big problem remains: “The [International Energy Agency] forecasts that abundant use of gas could raise atmospheric concentrations of CO₂ to 650 parts per million causing temperature to rise 3.5 degrees Celsius, which is more than many experts believe is tolerable for the health of the Planet.”¹⁷⁴ Thus, even by solving our coal problem through conversion to natural gas, we will not have solved the carbon and methane problems.

Methane is far more dangerous to humanity than carbon.¹⁷⁵ We miscalculated and under-estimated the role of the second-most prevalent GHG in warming.¹⁷⁶ We leak more methane than ever,¹⁷⁷ and we continue to build out methane (and leakage) infrastructure.¹⁷⁸ Continued fracking

in assigning methane a heating value of only 28 to 36 times that of CO₂, rather than 70 times or more.”

Ferrey, *supra* note 90, at 47 (citing Bill McKibben, *Global Warming's Terrifying New Chemistry*, THE NATION (Mar. 23, 2016), <https://www.thenation.com/article/global-warming-terrifying-new-chemistry/>).

¹⁷⁰ Ferrey, *supra* note 90, at 43.

¹⁷¹ As of May, 24, 2020, the earlier calculations remained on the EPA website. See <https://www.epa.gov/ghgemissions/overview-greenhouse-gases> under the “Methane” tab.

¹⁷² Here is Professor Ferrey’s example of the methane recalculation:

[I]n real time methane is approximately eighty-six times more heat trapping than CO₂. EPA and UNFCCC calculations have not factored in time, and have underestimated the role of methane by a factor of approximately 300%-500%--not 25, but 86-105 times more heat retention than molecules of CO₂. This original analysis not factoring in time translates to a major policy miscalculation that jeopardizes the climate future of the fast-warming planet.

Ferrey, *supra* note 90, at 47.

¹⁷³ *See id.* at 85.

¹⁷⁴ *Id.*

¹⁷⁵ “[M]ethane is at least thirty times to one hundred times more damaging in terms of retaining heat in the atmosphere than is CO₂....” *Id.* at 94.

¹⁷⁶ *See id.* at 47, 56.

¹⁷⁷ *See id.* at 50.

¹⁷⁸ “[N]ew Harvard data, which comes on the heels of other aerial surveys showing big methane leakage, suggests that our new natural-gas infrastructure has been bleeding

will make it nearly impossible for the United States to reach its promised 26-28% reduction goal from 2005 levels.¹⁷⁹ We now share our extraction technology (fracking) with other countries.¹⁸⁰ Yet there is no U.S. or global legal structure or regulation to even encourage methane recovery.¹⁸¹

f. Global Problems and Law

Professor Ferrey observes the real global problem of carbon, methane and other GHGs: “Warming molecules released anywhere on the Planet, warm the entire world, not just the immediate space where they are released.”¹⁸² As methane warms the entire planet, we are all at risk from any methane emissions. With global warming, humanity has encountered local causes with lethal global effects. We need global law to protect us.

There have been efforts at international cooperation, but the results are thin: “The Kyoto Protocol achieved, practically, nothing; in the twenty years since, despite all of our climate advocacy and legislation and progress on green energy, we have produced more emissions than in twenty years before.”¹⁸³ The Paris Agreement was a wonderful step forward,¹⁸⁴ but there remains no legal or regulatory system to ensure that goals become reality.

A single-use piece of international law, like a climate treaty, works only for one problem and does not adapt well to changing conditions—as would be more likely for regulation. The fact that we were able to leave the Paris Accord¹⁸⁵ demonstrates the ineffectiveness of the limited approach.

We in the United States cannot stand alone,¹⁸⁶ particularly for an issue with this kind of risk to all our rights. The rest of our world has waited for us. We, humanity, must pull together to avoid a collapse of trust.¹⁸⁷

methane into the atmosphere in record quantities.” McKibben, *supra* note 169.

¹⁷⁹ Ferrey, *supra* note 90, at 92 (citing McKibben, *supra* note 169).

¹⁸⁰ *See id.* at 81.

¹⁸¹ *See id.* at 97.

¹⁸² *Id.* at 44.

¹⁸³ WALLACE-WELLS, *supra* note 47, at 9.

¹⁸⁴ *See* CHRISTIANA FIGUERES & TOM RIVETT-CARNAC, *THE FUTURE WE CHOOSE: SURVIVING THE CLIMATE CRISIS* (2020) (by the architects of the 2015 Paris Accord).

¹⁸⁵ *See* Remarks Announcing United States Withdrawal from the United Nations Framework Convention on Climate Change Paris Agreement, 2017 DAILY COMP. PRES. DOC. 1 (June 1, 2017).

¹⁸⁶ When Syria joined the Paris Climate Accord in late 2017, the United States remained as the only organized nation not in the Accord. *See* Brady Dennis, *As Syria Embraces Paris Climate Deal, It's the United States against the World*, WASH. POST (Nov. 7, 2017), <https://www.washingtonpost.com/news/energy-environment/wp/2017/11/07/as-syria-embraces-paris-climate-deal-its-the-united-states-against-the-world/?utm>.

¹⁸⁷ If you had to invent a threat grand enough, and global enough, to possibly

Worse than a collapse of trust is the collapse of life. A 2018 study estimated the effect of a half-degree more of warming: “150 million more people would die from air pollution alone in a 2-degree warmer world than in a 1.5 degree warmer one.”¹⁸⁸ Although the number has since been revised upward,¹⁸⁹ Wallace-Wells frames the lower number, 150 million, as he explains our “existential crisis” as “a drama we are now haphazardly improvising between two hellish poles, in which our best-case outcome is death and suffering at the scale of twenty-five Holocausts, and the worst-case outcome puts us on the brink of extinction.”¹⁹⁰ Disturbingly this represents an *annual* toll.¹⁹¹

We must realize that humanity lacks an adequate means of protection. We see what we are up against. We need to get together again soon—to figure out how to move faster, as a species, than we ever have. We need a vision and a goal as part of a plan to escape the looming fires and floods.

II. GLOBAL LIMITS AND RESPONSES

We are exceeding global limits for consumption, pollution, and human population. We are quickly eroding our biodiversity and our climate systems, and we must slow down. In the world of economics, growth has long been the answer.¹⁹² Growth is now the opposite of the answer.

Humanity has been exceeding some global limits for decades and yet we continue.¹⁹³ We show little or no sign of returning to those limits. In fact,

conjure into being a system of true international cooperation, climate change would be it—the threat everywhere, and overwhelming, and total. And yet now, just as the need for that kind of cooperation is paramount, indeed necessary for anything like the world we know to survive, we are only unbuilding those alliances—recoiling into nationalistic corners and retreating from collective responsibility and from each other. That collapse of trust is a cascade, too.

WALLACE-WELLS, *supra* note 47, at 25.

¹⁸⁸ *Id.* at 28.

¹⁸⁹ See IPCC, GLOBAL WARMING OF 1.5 °C: AN IPCC SPECIAL REPORT ON THE IMPACTS OF GLOBAL WARMING OF 1.5 °C ABOVE PRE-INDUSTRIAL LEVELS AND RELATED GLOBAL GREENHOUSE GAS EMISSION PATHWAYS, IN THE CONTEXT OF STRENGTHENING THE GLOBAL RESPONSE TO THE THREAT OF CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT, AND EFFORTS TO ERADICATE POVERTY 246 (2018), <https://www.ipcc.ch/sr15/>.

¹⁹⁰ WALLACE-WELLS, *supra* note 47, at 28-29.

¹⁹¹ See *id.* at 28.

¹⁹² See Mark Rogers, *A Survey of Economic Growth*, 79(244) ECON. REC. 112, 112 (2003) (“Understanding the process of economic growth has been called the ultimate objective of economics.”); Heller & Robson, *supra* note 63 (claiming an evolutionary basis for an inherited preference for growth).

¹⁹³ The phenomenon of limits to growth was explored originally from 1970 to 1972 in the System Dynamics Group of the Sloan School of Management at Massachusetts Institute

since the year 2000, humanity's impact has only increased.¹⁹⁴ “Until now, decades of words and warnings have not changed modern human society's business-as-usual trajectory.”¹⁹⁵ However, if we exceed the limits too long, we erode our life support system and increase our risk of collapse.¹⁹⁶ Instead, we need to shrink our environmental footprint—and fast.¹⁹⁷

We need to find the brakes on this economic vehicle before we crash it. Speeding up will not help. But that seems to be all we have learned to do.

Those economists who subscribe to neo-classical economics favor income, profit, or wealth maximization as a response to the theory's assumption of self-interest.¹⁹⁸ These experts tend to favor growth to meet the requirements of profit, income, or wealth maximization.¹⁹⁹ Philosopher

of Technology (MIT). Initially, the study led to the publication of *Donella Meadows et al., The Limits to Growth* (1972), with twelve internally consistent scenarios of world development reaching from 1900 to 2100, all based upon computer modeling. See generally Graham Turner, *A Comparison of the Limits to Growth with Thirty Years of Reality*, 18 GLOBAL ENVTL. CHANGE 397 (2008), for a nice description of that modeling.

In 1972, there was hope for a gradual downward adjustment in humanity's footprint. The 1992 update, with a slightly updated computer model (World3), yielded the second edition, Donella Meadows et al., *Beyond the Limits*. This update had a major new finding: humanity had already overshoot the limits of Earth's carrying capacity. See MEADOWS, ET AL., 30-YEAR UPDATE *supra* note 5, at ix-xii. The concept of planetary overshoot was introduced in the 1987 report of the U.N.-sanctioned Brundtland Commission, *Our Common Future*, that

popularized the idea of sustainability and a narrower concept, sustainable development . . . [T]he report described the extent of world poverty and global environmental calamity and articulated, for the first time, sustainability's “Three Es”—environment, economics and social equity—arguing how all three realms must be optimized, and how, over the long term, a just and truly sustainable world cannot have one without the other.

Robert Eagan, *Sense & Sustainability*, 133 LIBR. J. 40, 40 (2008).

¹⁹⁴ Since 2000, 1.9 million km², an area the size of Mexico of ecologically intact land—that is, ecosystems that remain free from significant direct human pressure—has been lost, with most losses occurring within the world's tropical and subtropical grasslands, savannah and scrubland ecosystems, and the rainforests of Southeast Asia.

James Watson & Oscar Venter, *Mapping the Last Wilderness Areas on Earth*, in LIVING PLANET REPORT 2020, *supra* note 11, at 66.

¹⁹⁵ *Executive Summary*, in LIVING PLANET REPORT 2020, *supra* note 11, at 8.

¹⁹⁶ See MEADOWS, ET AL., 30-YEAR UPDATE *supra* note 5, at 164-67.

¹⁹⁷ “[W]e are facing a severe environmental crisis. Every issue of a science journal that you read has more alarming discoveries about the threat confronting us and the imminence of it. It's not hundreds of years away; it's decades, maybe.” CHOMSKY, *supra* note 53, at 38.

¹⁹⁸ See Draper, *Ranking Rights*, *supra* note 26, at 184.

¹⁹⁹ See John William Draper, *Human Survival, Risk, and Law: Considering Risk Filters to Replace Cost-Benefit Analysis*, 33 FORDHAM ENVTL. L. REV. 301, 387 n.303 (2016) [hereinafter Draper, *Risk Filters*].

Jean-Pierre Dupuy describes the result:

The chief risk facing every nation and people today, these experts solemnly maintain, is of being denied a place in the worldwide competition for economic supremacy—as if the future of humanity has now been reduced to something like a Grand Prix motor racing event. It means nothing to them that at the finish line a cliff awaits the winner, who will then plunge over it at fantastic speed, headlong into the abyss.²⁰⁰

Our maximizing behavior has overused and overstressed the natural systems of Earth for decades. As a result, our life support system is now damaged. We must reject the principle of unlimited growth. Some growth, like the growth of economic brakes, may be wise. But we need to work to slow our global economic vehicle. Maybe we should employ precaution?

A. The Precautionary Principle

One major theory of precaution, the subject of many books,²⁰¹ is known as the precautionary principle (PP). The principle has no single definition or formulation.²⁰² Elsewhere I have compared the principle to a “black and white” view of risk, such as how we view children playing with guns.²⁰³ This view, the root of the precautionary principle, “has led to the ‘better safe than sorry’ argument that teenagers have heard for years.”²⁰⁴ By another take, the PP “is, essentially, a restatement of a popular rendition of

²⁰⁰ DUPUY, *supra* note 4, at 56-57.

²⁰¹ See EVELYN ALVAREZ ET AL., PRECAUTIONARY PRINCIPLE, DOI: [10.1093/obo/9780199756797-0046](https://doi.org/10.1093/obo/9780199756797-0046) (Oxford Bibliography, last updated Feb. 24, 2021); CAROLINE E. FOSTER, SCIENCE AND THE PRECAUTIONARY PRINCIPLE IN INTERNATIONAL COURTS AND TRIBUNALS: EXPERT EVIDENCE, BURDEN OF PROOF AND FINALITY (2011); JOAKIM ZANDER, THE APPLICATION OF THE PRECAUTIONARY PRINCIPLE IN PRACTICE: COMPARATIVE DIMENSIONS (2010); INDUR GOKLANY, THE PRECAUTIONARY PRINCIPLE: A CRITICAL APPRAISAL OF ENVIRONMENTAL RISK ASSESSMENT (2001).

²⁰² See ALVAREZ ET AL., *supra* note 201, at Definition. However, an oft-cited version of the principle from the Rio Declaration states: “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” U.N. CONF. ON ENV’T & DEV., RIO DE JANEIRO, BRAZ., JUNE 3-14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. No. A/CONF.151/26/Rev.1 (Vol. I), Annex I, princ. 15 (Aug. 12, 1992).

²⁰³ Draper, *Neo-Classical Economics*, *supra* note 26, at 243.

²⁰⁴ *Id.*

the Hippocratic oath, namely, ‘first do no harm.’”²⁰⁵

The PP is a risk management principle used in EU environmental legislation, in international environmental agreements, in health policy, and in the regulation of new technologies.²⁰⁶ Some see the PP as a “can’t lose” proposition, a free roll.²⁰⁷ Others interpret it as a “partial decision-rule,”²⁰⁸ a “property of a decision-rule,”²⁰⁹ or “a guiding perspective for risk handling.”²¹⁰ PP is not a “complete decision-rule.”²¹¹ The PP is a simplification dependent upon context and interpretation.

The PP is a more-general version of the safety standard, the safe level of risk imposition, a feature of some U.S. statutory law as described by law professor Gregory Keating.²¹² Either PP or the safety standard, by itself, imposes heavy limits on liberty. According to philosopher Orri Stefánsson, “to avoid the charge of absolutism, most defenders of the PP, as a decision-rule, (explicitly) accept some tradeoffs between catastrophic risks and chances for more ordinary goods.”²¹³ Exceptions should be dispensed through a system. This is the place for feasible risk reduction, a different but related risk reduction feature in U.S. statutory law.²¹⁴ Feasible risk reduction can couple with the safety standard as a kind of release valve for essential liberty.²¹⁵ Precautionary safety must at some point give way to feasible risk reduction, or humanity loses too much liberty.

Precaution seems like a good idea, but it does not help if we are already too late. Humanity does not know precisely where it stands in relation to significant risks, but the study of climate change helps us see better the enormity and the ripeness of the risks involved. We may catch up or restore some stability if we can regain some ground already lost to our own uses.²¹⁶

²⁰⁵ GOKLANY, *supra* note 201, at 1-2.

²⁰⁶ See Orri Stefánsson, *On the Limits of the Precautionary Principle*, 39 RISK ANALYSIS 1204, 1204 (2019) [hereinafter, Stefánsson, *Limits of PP*]

²⁰⁷ See Annie Duke & Cass R. Sunstein, *Freerolls* (July 22, 2020), <https://ssrn.com/abstract=3658663>.

²⁰⁸ Stefánsson, *Limits of PP*, *supra* note 206, at 1205.

²⁰⁹ Orri Stefánsson, *Reply*, 39 RISK ANALYSIS 1227, 1227 (2019).

²¹⁰ Terje Aven, *Comments on Orri Stefánsson’s Paper on the Precautionary Principle*, 39 RISK ANALYSIS 1223 (2019).

²¹¹ Stefánsson, *Reply*, *supra* note 209, at 1227.

²¹² See Keating, *supra* note 26, at 720-21 (citing 42 U.S.C. § 7412(f)(2)(A) (2000) from the Clean Air Act Amendments of 1990).

²¹³ Stefánsson, *Limits of PP*, *supra* note 206, at 1205.

²¹⁴ See Keating, *supra* note 26, at 687 (citing 29 U.S.C. § 651(b) (2000) from the Occupational Safety and Health Act of 1970).

²¹⁵ See Draper, *Ranking Rights*, *supra* note 26, at 233-34.

²¹⁶ Uses include destruction. See Lior Strahilevitz, *The Right to Destroy*, 114 YALE L.J. 781, 787-96 (2005).

The problem with limits is that we do not know them all,²¹⁷ and we would prefer not to find out with our own extinction. If we are going to figure this out as a species, we need to study moves to gain increasing safety from each and every possible angle, from any academic discipline. Those moves may or may not be moves of precaution.

Precaution alone may fail. Functionally, the PP has not worked. How come? According to Jean-Pierre Dupuy, the problem is the difference between believing and knowing: “[W]e do not believe what we know to be true, because we cannot bring ourselves to face up to the implications of what we know.”²¹⁸ Strategic ignorance can also interfere.²¹⁹

What’s more, the PP has no gauge for the degree or significance of risk. Thus, “the precautionary principle, in failing to grasp the true nature of the threats we face, in laying emphasis on our ignorance when it is our inability, or unwillingness, to believe what we do know that is at issue, is supremely unsuited to helping us in our struggle for survival.”²²⁰ By failing to take scientific realities into account, the PP has the potential to provide an endless repetition of potential destruction. We cannot rely upon the PP to help us deal with global limits. A more complex directive is needed.

B. Cost-Benefit Analysis

Can we instead use money for self-control? Can cost-benefit analysis (CBA), a child of neo-classical economics based on self-interest,²²¹ help?

CBA has been used by the government since the Reagan administration as the method of evaluating possible responses to risk. In order to place a value on deaths avoided, CBA uses the value of statistical life (VSL). In practice, VSL places a value of about \$10 million on a life,²²² *before* that life is placed at risk.²²³ When a CBA decision places lives at risk, the one

²¹⁷ We don’t know our limits if we don’t know them all. Respecting ten essential known limits and missing the unknown eleventh can still prove fatal.

²¹⁸ DUPUY, *supra*, note 4, at 10 (e.g., the failure of CIA personnel to believe certain intelligence (knowledge) of impending terrorist attacks before September 11, 2001).

²¹⁹ Strategic ignorance is a means to circumvent inner moral conflict while acting self-servingly. See Johannes Jarke-Neuert & Johannes Lohse, *I’m in a Hurry, I Don’t Want to Know! Strategic Ignorance under Time Pressure*, at 1 (Sept. 24, 2020), <https://ssrn.com/abstract=3699289>. “In a litigation context, if the degree of guilt due to a transgression of the law depends on premeditation, then there is incentive for ‘willful’ ignorance in the first place.” *Id.* at 2.

²²⁰ DUPUY, *supra*, note 4, at 10-11.

²²¹ See *supra* note 27.

²²² See Cass R. Sunstein, *The Real World of Cost-Benefit Analysis: Thirty-Six Questions (And Almost as Many Answers)*, 114 COLUM. L. REV. 167, 182 n.66, 188 (2014).

²²³ See Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit*

receiving the \$10 million benefit is seldom one whose life has been risked.

This analysis translates into everyday financial decision-making. The neoclassical response to the pandemic (e.g., Treasury Secretary Steve Mnuchin's response²²⁴) was to worry about economic effects of the public health response.²²⁵ Self-interest prevailed.²²⁶

The unfortunate result for many COVID patients was death at the hands of the dollar.²²⁷ This reinforces the notion that "greed kills."²²⁸ The moral problem is that greed claims the lives of the innocent and the unconsenting.

The greater problem is that most current economic philosophy is ill-suited to the human situation. As philosopher Dupuy observes, "[W]e have irreversibly entered into an era whose ultimate prospect is the self-destruction of the human race."²²⁹ But our specialists are not looking at what matters.²³⁰ The lives of all are at risk. Quantitative risk analysis fails

Analysis of Environmental Protection, 150 U. PA. L. REV. 1553, 1553-54 (2002).

²²⁴ Saleha Mohsin, *Mnuchin Says U.S. Can't Shut Economy Even If Virus Resurges*, BLOOMBERG (June 11, 2020, 10:04 AM), <https://www.bloomberg.com/news/articles/2020-06-11/mnuchin-says-u-s-can-t-shut-economy-even-if-virus-resurges>.

²²⁵ See Laura Oliver, *It Could Take Three Years for the US Economy to Recover From COVID-19*, WORLD ECON. F. (Mar. 30, 2020), <https://www.weforum.org/agenda/2020/03/economic-impact-covid-19/>.

²²⁶ We are all still too greedy, shortsighted, and divided into warring tribes to make wise long-term decisions. Much of the time we behave like a troop of apes quarreling over a fruit tree. As one consequence, we are changing the atmosphere and climate away from conditions best for our bodies and minds, making things a lot more difficult for our descendants.

WILSON, HALF-EARTH, *supra* note 37, at 49. Neo-classical economics contributes to this behavior. See Draper, *Neo-Classical Economics*, *supra* note 26, at 224-25.

²²⁷ Those who needed to work but could not do so remotely were more likely to be harmed by COVID-19. See Martha Ross & Nicole Bateman, *COVID-19 Puts America's Low-Wage Workforce in an Even Worse Position*, BROOKINGS: THE AVENUE (Mar. 19, 2020), <https://www.brookings.edu/blog/the-avenue/2020/03/19/covid-19-puts-americas-low-wage-workforce-in-an-even-worse-position/> ("Some of the most common low-wage jobs are inherently interpersonal in nature (think retail and food service) and are thus uniquely vulnerable to the spread of COVID-19, both as a health and economic matter.").

²²⁸ Draper, *Ranking Rights*, *supra* note 26, at 218.

²²⁹ DUPUY, *supra* note 4, at 56.

²³⁰ Our specialists don't accept the visible risks of self-destruction:

Specialists in what is known as disaster risk management—economists who devise methods for insuring companies against various kinds of catastrophe—are deaf to any suggestion that environmental pollution, a worsening climate, the exhaustion of fossil fuels, the dangers associated with advanced technologies, growing economic inequalities on a global scale, terrorism, war, and the spread of weapons of mass destruction might combine to bring about this unhappy result. Each problem must, they insist, be treated in isolation from the others, be analyzed on its own terms. So obsessed are they with weighing costs and benefits that they do not feel the ground giving way beneath their feet.

us when it comes to such extreme events.²³¹ The benefits of lives saved are infinite, but where benefits are infinite, CBA is impossible.²³² CBA will fail humanity, no matter how complex we make it.

Would some kind of optimal prevention be preferable?

C. Optimal Prevention

“Optimal prevention” sounds like an attempt at perfection. However, it is an economic theory in the fields of insurance,²³³ health,²³⁴ economics,²³⁵ risk management,²³⁶ and invasive species.²³⁷ The theory holds that there is an optimal use of money to prevent something, even death, from occurring.²³⁸

The survival of the human species—or for that matter any other species—is priceless.²³⁹ Survival decisions merit more care than a mere financial calculation.

We need systems to deal with risk, and those systems need to work well at reducing significant risk. But we do not need an optimal response to deal with one particular risk. In the process, we would pay less attention to other significant risks. Risk analysis should not be financially optimal. Instead, it should arrive at technologically and economically feasible results, but only for significant risks not subject to the safe level of risk imposition.²⁴⁰

Perfection is the enemy of the good. If we try to perfectly whack each mole in the game of whack-a-mole, we will be more likely to miss some moles. In the context of prevention of significant risk, the endless repetition of significant risks that we encountered earlier with the precautionary

Id.

²³¹ Draper, *Neo-Classical Economics*, *supra*, note 2625, at 211-12.

²³² *Id.* at 212-13.

²³³ See Romain Gauchon, et al., *Optimal Prevention Strategies in the Classical Risk Model*, 91 *INS.: MATHEMATICS & ECON.* 202 (2020).

²³⁴ See Marco Brianti, et al., *Optimal Choice of Prevention and Cure under Uncertainty on Disease Effect and Cure Effectiveness*, 72 *RSCH. ECON.* 327 (2018).

²³⁵ See Takumi Motoyama, *Optimal Disaster-Preventive Expenditure in a Dynamic and Stochastic Model*, 51 *J. MACROECONOMICS* (March 2017), at 28.

²³⁶ See Richard Peter, *Who Should Exert More Effort? Risk Aversion, Downside Risk Aversion and Optimal Prevention* (May 6, 2019), <https://ssrn.com/abstract=3383853>.

²³⁷ See Kimberly Burnett et al., *Species Invasion as Catastrophe: The Case of the Brown Tree Snake*, 51 *ENVTL. & RES. ECON.* 241 (2012).

²³⁸ See Marie-Louise Leroux & Grégory Ponthière, *Optimal Prevention When coexistence matters*, 26 *J POPULATION ECON.* 1095 (2013).

²³⁹ See ACKERMAN & HEINZERLING, *PRICELESS*, *supra* note 26, at 69-70, 160-63, 229-33.

²⁴⁰ See Draper, *Risk Filters*, *supra* note 199, at 344-47.

principle would be more likely to occur.²⁴¹

If we bar the door thoroughly from some risks, there will be very little room left for the very liberty that we need to survive. We need increasing doses of both liberty and security.²⁴² We must leave space for tradeoffs.

However, we might use optimal prevention for multiple risks. With measures of optimal prevention, we can encounter new efficiencies in aligning and solving multiple risks.²⁴³ From a global risk perspective, optimal prevention theory may help find useful synergies. If solving multiple risks simultaneously appeals to the insurance industry, imagine how synergistic risk reduction might appeal to scientists or physicians.

D. A Lack of Global Systems and Laws

We know we have been exceeding some global limits for decades. Worse, we have no global systems or laws in place to protect our species or its life support system from the eventual effects of these actions.

We must reject the psychological (precaution), the self-interested (CBA), and the fiscally perfect (optimal prevention) means of analyzing risks to the human future. Each focuses either on money or on avoiding a negative result. We will soon see ways to preferable alternatives.

We as a species have no means to effectively get our footprint back within one limit, let alone all the limits we are exceeding. And again, we do not even know what all those limits may be.

The critical question is, “How do we go about changing our systems to protect our lives?” Economic incentives, dire pleas, global goals, and other means of embracing change have been considered and tried, and the system has not changed sufficiently. This demonstrates the power of our own self-interest and the power of neo-classical economics.

Now, our self-interest may be changing. In the current series of climate catastrophes, many see climate change as an emergency and that protecting our lives is more important than profit or convenience (in releasing carbon). Our self-interest changes through revised personal assessments of risk.

Climate goals are likely to have beneficial effect. However, there is a huge difference between setting goals and creating systems of regulation. We need systems to help regulate our behavior and bring it into line with our scientifically-determined global limits—to steer clear of disaster.

²⁴¹ See discussion *supra* § II.A.

²⁴² See Draper, *Risk Filters*, *supra* note 199, at 312-14.

²⁴³ See Christophe Courbage et al., *Optimal Prevention for Multiple Risks*, 84 J. RISK & INS. 899 (2017).

As we further and longer exceed the planet's known limits, risks to our species only grow. Through the windows of science and technology, we find that our chances of failure are rapidly increasing.²⁴⁴

We need systems that help us assess and confront risk and save lives. Humanity should create robust models, organizations, regulations, and procedures to cope with and adapt to the variety, depth, breadth, and sheer number of risks that we, as a species, face.²⁴⁵ These are the systems that we need to build to protect humanity and its life support system going forward.

Due to space limitations, we must save the details of what we should build and how it should work for another article. To find solutions, one needs to consider the scope of the problem. It relates only to *certain* risks.

III. RISK ANALYSIS

How shall we evaluate the risks to the human species that we covered in Part I? Only certain risks should qualify for attention and reduction: those that are both foreseeable and significant. Significance of risk is enhanced when we encounter the irreversibility of life and death.

We will now define and consider foreseeability and significance of risk. As part of risk analysis, we will then take a quick look at irreversibility.

A. Foreseeability

Risks must be foreseeable in that we can understand them and discuss them in advance. In accident law, defendants are protected when the result is not foreseeable.²⁴⁶ This standard in accident law is an easy standard to meet. We only need to be able to discuss and analyze a future risk for it to be foreseeable. There must be some factual basis for the risk.

We can only evaluate those risks that are foreseeable. If risks are not reasonably foreseeable, they should not be on the human radar screen. Some risks may be recurring, like pandemics or asteroid collisions.²⁴⁷ Others may be identified by scientific method as new or increasing risks.

²⁴⁴ See e.g., Graeme Wood, *The Next Decade Could Be Even Worse*, THE ATLANTIC (Dec. 2020), <https://www.theatlantic.com/magazine/archive/2020/12/can-history-predict-future/616993/> (“A historian believes he has discovered iron laws that predict the rise and fall of societies. He has bad news.”).

²⁴⁵ See Draper, *Risk Filters*, *supra* note 199, at 304-10.

²⁴⁶ See generally *Palsgraf v. Long Island R.R. Co.*, 162 N.E. 99 (N.Y. 1928).

²⁴⁷ An asteroid the size of a boxcar departing Earth's orbit may no longer offer a foreseeable collision. However, the prospect of future space objects offering a foreseeable possible collision makes the continuing study of planetary collisions worthwhile.

Risk enterprises, especially our greatest one, our species, must factor in all aspects of the stochastic model or process into our efforts to survive.²⁴⁸ We should leave no blind spots.²⁴⁹ However, humanity cannot possibly concern itself with chasing every risk. Risks must also be significant.

B. Significance of Risk

To be significant, a risk must be both salient (separate and identifiable) and devastating (a risk that ripens into the kind of injury that seriously impairs ordinary life).²⁵⁰ Attending to insignificant risks not only wastes precious time and resources, it suppresses essential liberties.

By their very nature and gravity, magnified by their degree of foreseeability, risks to the survival of humanity must be deemed significant.²⁵¹ Science provides us with windows into several such risks, including insufficient food supply, fresh-water scarcity in a rising number of locales, pandemics, massive die-offs of other species upon which we depend, and the complicating and exacerbating factor of climate change.

Cumulative risks can, over time, reach the level of foreseeability. Likewise, the risks created can change in significance over time. Ultimately, humanity will benefit from systems to identify, to study, and to prepare for new significant risks, cumulative or not, as they arise.

C. Irreversibility

Irreversibility matters, especially for those risks that are significant.²⁵² As a risk, death is both significant and irreversible. This alone provides strong motivation to avoid early death. Unless we aim to avoid an early exit, each of us would throw away the precious remaining days and years of our lives. We lose too much. Thus, we tend to take rational precautions.

We do not want to place our lives at risk without reason or justification. Irreversibility animates our concerns. Cass Sunstein's article on the subject discusses problems with incommensurability between risks.²⁵³ Although he

²⁴⁸ See Draper, *Risk Filters*, *supra* note 199, at 308.

²⁴⁹ See *e.g.*, Draper, *Neo-Classical Economics*, *supra* note 26, at 217-18 (discussing blind spots in our current system of risk regulation).

²⁵⁰ See Keating, *supra* note 26, at 693. This requirement is borrowed from accident law. By extending risk analysis to survival of the human species, "we all bear the burden, the significant risk of devastating injury." Draper, *Risk Filters*, *supra* note 199, at 374.

²⁵¹ See Draper, *Risk Filters*, *supra* note 199, at 349.

²⁵² Irreversibility does not necessarily matter for insignificant risks.

²⁵³ See Cass R. Sunstein, *Irreversibility*, 9 L., PROBABILITY & RISK 227, 237-238 (2010).

acknowledges the importance of the difference between losing goods or money (property) and things without real substitutes (lives),²⁵⁴ Sunstein's approach to irreversible risk places an option price on an immeasurable moral value, life itself.²⁵⁵ There can be no adequate compensation for such risks; we must reject Sunstein's approach to dealing with irreversibility. It cannot produce a safe decision filter in the context of human survival.

We should not wait to determine whether humanity's risk is irreversible. Although we might like to think that as long as we are alive we have a chance, we might have already set out on an impossible course. We must watch for dead ends. More importantly, seeking sure ways forward as a species will help differentiate between risks that are significant and those that are not. This may then increase both liberty and security.²⁵⁶

We worry about devastating injuries to individuals or to communities. Professor Keating points out that “[d]evastating injury presents special problems of fairness, both because devastating injuries are especially severe and because they cannot be repaired *ex post*.”²⁵⁷ But if we are all at risk, the solution must also be equitable and moral. In some cases, as in clean air and water, the safety standard may be required to eliminate significant risk.

We have placed Earth's life support system at risk. When species die out, they are lost. Genetic substitutes are only that. Some important characteristics might be replicated, but not without genetic risk. Humanity also faces a major risk in its loss of connection to the life support system.²⁵⁸

²⁵⁴ See *id.* at 237.

²⁵⁵ See Draper, *Risk Filters*, *supra* note 199, at 329-30.

²⁵⁶ Professor Keating makes the case for risk elimination in the name of protecting liberty: “The imposition of insignificant—but real—risks of devastating injury is so pervasive that the elimination of insignificant risks of devastating injury would cripple our freedom of action.” Keating, *supra* note 26, at 661. Seeking and chasing insignificant risks could also harm human security as our limited attention to risk would then be distracted and resources spread thin. As they decline, liberty and security can be corrosive against each other. See Draper, *Risk Filters*, *supra* note 199, at 314. Risk elimination appears to be an antidote.

²⁵⁷ Keating, *supra* note 26, at 746. Consequently, “[t]he fair treatment of risks of devastating injury requires that we take more than cost-justified precaution against their occurrence.” *Id.*

²⁵⁸ We all grew up together. We come from the wilds; they are precious:

Nature in the wildlands is the birthright of everyone on Earth. The millions of species we have allowed to survive there, but continue to threaten, are our phylogenetic kin. Their long-term history is our long-term history. Despite all of our pretenses and fantasies, we always have been and will remain a biological species tied to this particular biological world. Millions of years of evolution are indelibly encoded in our genes. History without the wildlands is no history at all.

WILSON, *HALF-EARTH*, *supra* note 37, at 211.

Our system is already killing. Inversions of liberty and property over life happen on a regular basis. We lose precious and sacred life every day. We have the option as a larger group to remake this system. Why not try?

Given the foreseeability and significance of the risks we face, if we do not try, it is reasonably foreseeable that humanity will not survive as a species. A Chinese chemistry professor is emphatic when he sees behavior posing significant risks to humanity: “We cannot take a chance and hesitate in a matter of human survival; we must stop it.”²⁵⁹ These kinds of risks are not optional. We must protect ourselves.

IV. NEED AND DUTY

A. Needed Actions

What actions are called for? According to law professor Craig Pease, our most pressing climate change problem is institutional incompetence: “Institutions that arose with the use of fossil fuels are now tasked with banning them.”²⁶⁰ Importantly, large institutions have not yet developed the same high levels of trust that we have with small groups and tribes.²⁶¹

The problem goes beyond our large institutions to the people tasked with regulating them. According to Stanford’s Graham Steele, “[I]t is difficult to deny that there is a ‘cognitive dissonance’ between the potential threat posed by climate change and the intransigence of U.S. financial regulators.”²⁶² Those regulators view climate change through a limited environmental or social lens. “Treating climate change as a niche issue, however—one essentially of corporate social responsibility—approaches climate financial risk as an ancillary risk, like reputational risk, rather than the core financial risk that it is. This results in business and regulatory strategies that reflect this worldview.”²⁶³ Climate concerns are framed as a

²⁵⁹ Zhengxi Wang, *The Principle of Unicity of the Human Species* (April 29, 2020), <https://ssrn.com/abstract=3588959>.

²⁶⁰ Craig M. Pease, *Why Institutions Don’t Respond to a Clear and Present Danger*, ENVTL. F., Jan./Feb. 2019, at 17, 17. According to Pease, large institutions have properties that cause them to fail to take appropriate action in response to scientific knowledge. *Id.* They may be engaging in self-protective behavior, possibly worrying more about sunk investment (and even their credibility from past decisions) than about significant risks that can be treated as irrelevant. They likely find more short-term profits by arguing rather than by adapting. There may be short-term cost efficiencies (in violation of public policy) in need of dampening. Clearly, we need a stated policy.

²⁶¹ *Id.*

²⁶² Graham Steele, *Confronting the “Climate Lehman Moment”: The Case for Macropprudential Climate Regulation*, 30 CORNELL J.L. & PUB. POL’Y 109, 112 (2020).

²⁶³ *Id.* at 113.

“social engineering” concern instead of “risk management.”²⁶⁴

Our capitalist system values money, profit, and wealth more than anything. This skews other systems away from change. Although “[i]t has become commonplace among climate activists to say that we have, today, all the tools we need to avoid catastrophic climate change—even major climate change[,] ... political will is not some trivial ingredient, always at hand.”²⁶⁵ So, yes, the problem is political. However, laws are made by politicians. If politics are perceived as a problem, the laws we need to survive will not be enacted. We need a will to change.²⁶⁶

We want to continue our profligate behavior as we have learned that it leads to profit and success. We have a system that overly relies on short-term profit projections and deliveries.²⁶⁷ Short-termism has gotten the best of us. Our system needs a reminder, and Greta Thunberg provides it: “We can’t just continue living as if there was no tomorrow, because there is a tomorrow.”²⁶⁸ We need to build “tomorrow” into our system.

We need laws and systems to protect our species from itself. That protection needs to properly become part of our law right away.

The questions we face are not merely practical, everyday matters. We need to study *how* to meet the needed goals, including those pertaining to the climate and to protecting the planet’s life support system.²⁶⁹ We need to

²⁶⁴ Kevin J. Stiroh, *Emerging Issues for Risk Managers*, FED. RSRV. BANK N.Y. (Nov. 07, 2019), <https://www.newyorkfed.org/newsevents/speeches/2019/sti191107>. “Ignoring the environmental, economic, and financial risks of a climate crisis is a choice based upon certain ideological and political decisions and requires rejecting the overwhelming weight of empirical data.” Steele, *supra* note 262, at 4 n.12. When asked about the view that central banks are not responsible for climate change, European Central Bank Governor Christine Lagarde responded: “I’m aware of all that. I’m also aware of the danger of doing nothing.” Jack Ewing, *Climate Change Could Blow Up the Economy. Banks Aren’t Ready*, N.Y. TIMES (Jan. 23, 2020), <https://www.nytimes.com/2020/01/23/business/climate-change-central-banks.html>.

²⁶⁵ WALLACE-WELLS, *supra* note 47, at 44.

²⁶⁶ “There is nothing stopping us from four degrees other than our own will to change course, which we have yet to display.” *Id.* at 15.

²⁶⁷ See Leo Strine, *Our Continuing Struggle with the Idea that For-Profit Corporations Seek Profit*, 47 WAKE FOREST L. REV. 135, 136-38 (2012).

²⁶⁸ Charlotte Alter et al., *The Conscience*, TIME, Dec. 23-30, 2019, at 50, 50.

²⁶⁹ We must recognize our scientific obligation to study our world to help us protect our future:

Like it or not, and prepared or not, we are the mind and stewards of the living world. Our own ultimate future depends upon that understanding. We have come a very long way through the barbaric period in which we still live, and now I believe we’ve learned enough to adopt a transcendent moral precept concerning the rest of life. It is simple and easy to say: Do no further harm to the biosphere.

strategize, and we need to structure a system with new risk filters.²⁷⁰ Parts of our system of response need to work well together, or we risk starvation, deadly thirst, drowning, or cooking in our own manmade hell.

To have a livable environment for our children, we need to curtail certain behavior. As today's great problems are global, some behavior needs to be globally curtailed or limited, controlled or regulated. We have created this globalized world, and we are aware of events world-over. We are intelligent. We see trends. Some of those trends are bigger than all of us—and more important than anyone's budget or profit.²⁷¹

It would be reasonable to expect that government, any government or branch thereof, would try to protect our lives if presented with significant risk.²⁷² That would seem to be part of the basis for having government in the first place.²⁷³ What's more, life is a more important interest than the self-interest of those supporting a limited configuration of state action.

We must decide whether we will survive. According to Austrian psychologist Viktor Frankl, it is our decision.²⁷⁴ We need a decision at the individual level as well as at the group level. The group level must extend fully, or our decision will be incomplete.

Some decisions need to be made and implemented at the global level, or we will not have the coordination and ability necessary to protect our life support system.²⁷⁵ We also need supportive decisions at the local level to better utilize and respect (non-lethal) local behavior and traditions.

With hundreds of millions of lives at risk annually, David Wallace-Wells characterizes the facts of climate change as “hysterical.” Together, all our possible futures are at risk. He employs a Cold War analogy that holds up: Our own actions constitute a risk to our own future.²⁷⁶

Wallace-Wells then notes the cloud's silver lining. We are still be in

WILSON, HALF-EARTH, *supra* note 37, at 212.

²⁷⁰ See Draper, *Risk Filters*, *supra* note 199, at 323-75.

²⁷¹ Greta Thunberg put it well when she told the United Nations, “[Y]ou have come to us young people for hope. How dare you? You have stolen my dreams and my childhood with your empty words.’ She added, ‘We are in the beginning of a mass extinction and all you can talk about is money. You are failing us.’” Ted Anthony, *Teen Activist Draws Praise and Potshots*, PHILA. INQUIRER, Sept. 25, 2019, at A3.

²⁷² Unfortunately, “the idea that governments place a high priority on security is mythical.” CHOMSKY, *supra* note 53, at 8.

²⁷³ What one gives up in liberty, one gains in security.

²⁷⁴ See VIKTOR E. FRANKL, YES TO LIFE: IN SPITE OF EVERYTHING 28 (Joelle Young, trans., Beacon Press, 2020).

²⁷⁵ “[W]e have to go beyond individual action to collective action. In our world that means actions by states....” CHOMSKY, *supra* note 53, at 111.

²⁷⁶ WALLACE-WELLS, *supra* note 47, at 29.

control. We remain the authors of our future.²⁷⁷ No matter how much comfort we receive from this, the burden is too great to be shouldered by just a few: “Each of us imposes some suffering on our future selves every time we flip on a light switch, buy a plane ticket, or fail to vote. Now we all share a responsibility to write the next act.”²⁷⁸ Hopefully, if we can engineer degradation, we can engineer our way out of it.

We are in position to make wonderful strides. We can shape our fate.²⁷⁹ Two-thirds of American energy is wasted.²⁸⁰ Yet our global subsidies for fossil fuels are \$5 trillion a year.²⁸¹ We can save money, reduce pollution, and help the planet, all in the face of potential annihilation.²⁸²

.Many of us sense “a pervasive malaise, a sense that everything is going wrong.”²⁸³ It is. The human system and trajectory are both unsustainable. Thus, we face a question: “Will we change, or will we die off?” As we have changed all along, we know how. The choice is ours.²⁸⁴ I would want to add “and no one else’s,” but bacteria and viruses may have a say.

We face a host of significant risks to the survival of the human species. These risks include destruction of other species (our life support system) and their homes; waste of precious freshwater needed to support lives; cooking and drowning the planet through climate change; poisoning of air, water, and food with toxins; overpopulation of the planet beyond its ability to sustain human life; and risks to the health security of a globalized population. There is no limit to possible ways to fail.

If we are busy fighting respective possible failures, we will find that humanity cannot maneuver fast enough to solve the challenges successfully.

²⁷⁷ *Id.* at 30.

²⁷⁸ *Id.* at 30-31.

²⁷⁹ “Either we change our fate, if possible, or we willingly accept it, if necessary.” FRANKL, *supra* note 274, at 39.

²⁸⁰ See Anne Stark, *Americans Used More Clean Energy in 2016*, LAWRENCE LIVERMORE NAT’L LAB’Y (April 10, 2017), <http://llnl.gov/news/americans-used-more-clean-energy-2016> (see graphic).

²⁸¹ See David Coady et al., *How Large Are Global Fossil Fuel Subsidies*, 91 WORLD DEV. 11, 15-16 (2017).

²⁸² “Annihilation is only the very thin tail of warming’s very long bell curve, and there is nothing stopping us from steering clear of it.” WALLACE-WELLS, *supra* note 47, at 34.

²⁸³ CHOMSKY, *supra* note 53, at 158.

²⁸⁴ Although we have a choice, we do not see it:

The mindless race to the edge of the abyss that we are witnessing today exhibits the logical structure of self-transcendence. No matter that each one of us helps to perpetuate the competition on which it feeds, we apprehend it as something wholly external to us and beyond our control, as an imperative that nobody can disobey. It is as though our fate is written down in every detail—and yet we are the ones who have dictated the text of this inscription.

DUPUY, *supra* note 4, at 57.

Some solutions will work well until they come into conflict with solutions to other problems.²⁸⁵ Conflicting solutions will likely tie our hands by leaving us unable to prioritize goals and methods.²⁸⁶ As more and more of these “one-off” risks line up around us, and we are increasingly unable to keep them at bay, humanity will be able to more clearly look into the abyss of failure.²⁸⁷ Piecemeal solutions will not work.²⁸⁸ We must avoid this approach to risk assessment and reduction.²⁸⁹

We need to build human rights, the rights of all humans to exist, into all systems, including our legal systems. Human rights need to be embedded deeply, as an integral part of how we are and what we do. To protect and honor these rights, we need to embed them at the system level for all persons, natural *and artificial*. To do otherwise invites significant risk.

B. A Duty to Act

Humanity has created the risks to our species and the planet. It is frightening. We see no help on the way. Waiting makes matters worse. We have a legal duty not to contribute to the taking of lives. We must respect the rights of others to life. Legally, we must act.

To fail to move to protect the billions of lives currently at risk would be a crime against humanity. Could massive gross negligence be a crime against humanity? When the annual toll would exceed 25 Holocausts, we cannot let it become reality. We do not need to; we know the answer.

Humanity has a duty to act—and to act now. As we know what we are

²⁸⁵ As conflicts rise, we will be increasingly overwhelmed with confusing and contradictory choices. How do we feed everyone without destroying natural lands? How do we power and heat our homes with natural gas (instead of coal) when methane leaks will significantly aid in cooking the planet? How do we get control of the global population? And how do we protect from the next pandemic?

²⁸⁶ As our choices diminish and our fears grow, we conflict with each other resulting in “the moves toward authoritarian nationalism and religious extremism that we’re seeing around the world.” CHOMSKY, *supra* note 53, at 140. Painting the future of humanity into a corner evokes a fearful reaction.

²⁸⁷ Peering down from on high can prompt an urge to jump. See Jennifer L. Hames, *An Urge to Jump Affirms the Urge to Live: An empirical examination of the high place phenomenon*, 136 J. AFFECTIVE DISORDERS 1114 (2012).

²⁸⁸ “Because the problems created by humanity are global and progressive, because the prospect of a point of no return is fast approaching, the problems can’t be solved piecemeal.” WILSON, *HALF-EARTH*, *supra* note 37, at 1-2.

²⁸⁹ “We know much sooner what we do not want than what we want. Therefore, moral philosophy must consult our fears prior to our wishes to learn what we really cherish.” HANS JONAS, *THE IMPERATIVE OF RESPONSIBILITY: IN SEARCH OF AN ETHICS FOR THE TECHNOLOGICAL AGE* 27 (Hans Jonas with David Herr, trans., 1984).

doing to the Earth, our duty is informed.²⁹⁰ “Our responsibility is all the more enormous as we become more and more convinced that we are the sole cause of what will happen to us.”²⁹¹

It is very easy to forget an important related matter here: Tomorrow is not a matter of politics but a matter of *right*. You and all your relatives have rights. The basic ones are life, liberty, and property.²⁹² These secular rights apply to each of us and to all of us equally. At least they should.

Life comes first, both individually and collectively²⁹³—for without life, we have no rights. A collective life failure destroys all individual rights.²⁹⁴ We must work to protect the individual rights—of all of us together, at once. The Bill of Rights are to be neither narrowly construed²⁹⁵ nor subject to election.²⁹⁶ This especially includes the right to life.

If doctors lack the right to deny any patient their right to live,²⁹⁷ what gives any of us the right to deny any other random human the right to their future? Nothing. But it is not just any one of us doing this, it is our system.

A taking is underway, but neither the government nor private enterprise should be allowed to take life by policy or practice. Our system is deadly in a large way.²⁹⁸ We must face our responsibility for this inversion.²⁹⁹

²⁹⁰ “We are now witnessing the emergence of humanity as a quasi-subject, the dawning awareness that its destiny is self-destruction, and the birth of an absolute responsibility to avoid this self-destruction.” DUPUY, *supra* note 4, at 5.

²⁹¹ *Id.* at 1.

²⁹² See Draper, *Ranking Rights*, *supra* note 26, at 181.

²⁹³ Concern for individual life and survival of the human species are both rooted in the intersection of the natural and the human creation. See DWORKIN, *supra* note 108, at 83.

²⁹⁴ We do not know when survival risks will ripen, but we do know this: “[I]f we do not protect life above liberty and property, we, as a species, are more likely to face more significant risks to our survival. We would be more negligent and self-destructive.” Draper, *Ranking Rights*, *supra* note 26, at 235.

²⁹⁵ “The Bill of Rights is not a list of concrete, detailed remedies drawn up by parsimonious draftsmen but a commitment to an abstract ideal of just government....” DWORKIN, *supra* note 108, at 166.

²⁹⁶ Let us not forget this forceful statement of Justice Jackson in *Barnette*:

The very purpose of the *Bill of Rights* was to withdraw certain subjects from the vicissitudes of political controversy, to place them beyond the reach of majorities and officials and to establish them as legal principles to be applied by the courts. One’s right to life, liberty, and property, to free speech, a free press, freedom of worship and assembly, and other fundamental rights may not be submitted to vote; they depend on the outcome of no elections.

W.Va. State Bd. of Educ. v. *Barnette*, 319 U.S. 624, 638 (1943).

²⁹⁷ See FRANKL, *supra* note 274, at 77-78.

²⁹⁸ See discussion of inversions by ranking liberty and property over life in Draper, *Ranking Rights*, *supra* note 26, at 201-19.

²⁹⁹ “[A]s long as we have breath, as long as we are still conscious, we are each responsible for answering life’s questions. This should not surprise us once we recall the

Many people claim innocence in the face of overpowering evidence of nearby deathly activities. For example, during the Holocaust, the Austrian public, through psychic numbing,³⁰⁰ absolved themselves of responsibility for what was happening in the Nazi death camps:

That same plea of innocence, *I had no idea*, has contemporary resonance in the emergence of an intergenerational tension. Young people around the world are angry at older generations for leaving as a legacy to them a ruined planet, one where the momentum of environmental destruction will go on for decades, if not centuries.³⁰¹

This analysis is too hopeful. In our current situation, we may be lucky if the damage continues for centuries. Much damage could have a lasting, lethal finality long before that. We have turned a blind eye for too long.³⁰²

Confronting reality and power can have high costs. Having to face the truth may induce great fear among us and cause us to look for other ways out. If denial does not work for some, they may wish to use anger or place blame. All of this is problematic.

Rather than worry about confronting power, let us frame the matter differently. Let us view it as a gamble. When we gamble, we consider risks and probabilities. By processing the risks of global warming this way, we see that “[m]itigation of global warming is a rational, common-sense safeguard even for those who doubt the seriousness of the situation.”³⁰³

Overcoming denial is an early and important step to finding a solution to a problem. To effectively confront and deal with humanity’s challenges, we must get past denial. There are some good signs.³⁰⁴

Awakening from denial can happen differently for different people,

great fundamental truth of being human—being human is nothing other than being conscious and being responsible!” FRANKL, *supra* note 274, at 41. “[D]eath forms the background against which our act of being becomes a responsibility.” *Id.* at 42.

³⁰⁰ See Paul Slovic, “*If I Look at the Mass I Will Never Act*”: *Psychic Numbing and Genocide*, 2 JUDGMENT & DECISION MAKING 79, 85, 90 (2007).

³⁰¹ Daniel Goleman, *Introduction*, in FRANKL, *supra* note 274, at 12-13.

³⁰² “This environmental not-knowing has gone on for centuries, since the Industrial Revolution.” *Id.* at 13.

³⁰³ ANNE C. CUNNINGHAM, *CRITICAL PERSPECTIVES ON FOSSIL FUELS VS. RENEWABLE ENERGY* 208 (2016).

³⁰⁴ E.g., 57 percent of conservative Republicans support the general concept of a Green New Deal. See Clive Thompson, *We Might Be Reaching ‘Peak Indifference’ on Climate Change*, WIRED (Mar. 25, 2019), <https://www.wired.com/story/we-might-be-reaching-peak-indifference-on-climate-change/>. Unfortunately, many do not think that climate change is caused by human activity. See *id.*

especially with differences in cultures and in technology. Differences can help us, say with social media, fall apart—and splinter. But if we are all here as brothers and sisters together, we need each other. And we need to cooperate with respect for one another.

We have the power to affect the human future. That power is, in fact, a responsibility. This human condition is both terrible and glorious.³⁰⁵ Our glorious ability to author change is the source of our terrible responsibility to do so. It is our responsibility to protect the human future.

Science is real.³⁰⁶ We cannot wish away our problems. It would be nice to be able to continue to think that everything will turn out just fine. But that is not what is taught in law school. And that is not a potentially successful way for a lawyer to handle risk management.³⁰⁷ So why should we accept that behavior in our legislative policy and regulatory systems?

We must prepare.³⁰⁸ The trouble is that the risks are not being studied systematically and fully. Some risks are unknown, beyond our current comprehension. Destroying the life support system of the planet might be something like that. Each of us needs to ask ourselves whether we really want to play an active role in the destruction of the planet.

Who created these significant risks? We did. We did it with our own success. In the process of creating a safe, convenient, and civilized world for ourselves and our offspring, we are deep in the process of destroying the natural world upon which our lives depend. We are beyond global limits, and we have no law to protect us from our own behavior. We need one.

We have a duty, a duty to protect ourselves from all these significant risks. The duty extends to everyone, even to politicians—and even to those who impose the political and environmental costs. Who bears the legal and moral duty to act? We do. Each and every one of us. No matter the creed, the race, or the means, we each bear a secular duty to protect human life.

V. A NEW VISION

The human situation is much more delicate than we heretofore have understood. Collective action at the species level is unheard of—or is it?

³⁰⁵ See FRANKL, *supra* note 274, at 106.

³⁰⁶ See David Willman, 'Science Is Real,' *Marchers in Nation's Capital and Worldwide Declare*, L.A. TIMES (Apr. 22, 2017, 2:55 PM), <https://www.latimes.com/nation/la-na-new-science-march-20170422-story.html>.

³⁰⁷ "[F]alse assumptions will bite at some point. It's only a matter of time." Mark Bassingthwaight, *What's Wrong with Assuming Everything Will Turn Out Just Fine?*, 68 VA. LAW., Oct. 2019, at 46, 46.

³⁰⁸ "Failing to prepare is preparing to fail." JOHN WOODEN & JACK TOBIN, *THEY CALL ME COACH* 218 (2004).

Consider the global agreement on the production of chlorofluorocarbons (CFCs).³⁰⁹ We can control ourselves to some degree—on single issues—with multilateral agreements. However, hit or miss efforts will not enable the prompt build-out of complex new systems and innovation.³¹⁰

We need a new vision of what we are, of who we are, and of how we live.³¹¹ That new vision must include our own survival.³¹² We need to support the human endeavor and envision the operation of a new system.

We face challenges of scale, depth, and repetition³¹³ that we have never

³⁰⁹ The Montreal Protocol successfully implemented a system in which chlorofluorocarbons were almost completely phased out. *See* Press Release, U.N. Environ. Prog., Countries commit to protect the ozone layer and climate under the Montreal Protocol, <https://www.unep.org/news-and-stories/press-release/countries-commit-protect-ozone-layer-and-climate-under-montreal> (Nov. 13, 2019) (“The Montreal Protocol is a global agreement to protect the Earth’s ozone layer by phasing out the chemicals that deplete it. The landmark agreement entered into force in 1989 and it is one of the most successful global environmental agreements.”).

³¹⁰ Consider the complexity of the challenges facing us:

It is often said that the human brain is the most complex system known to us in the universe. That is incorrect. The most complex is the individual natural ecosystem, and the collectivity of ecosystems comprising Earth’s species-level biodiversity. Each species of plant, animal, fungus, and microorganism is guided by sophisticated decision devices. Each is intricately programmed in its own way to pass with precision through its respective life cycle. It is instructed on when to grow, when to mate, when to disperse, and when to shy away from enemies. Even the single-celled *Escherichia coli*, living in the bacterial paradise of our intestines, moves toward food and away from toxins by spinning its tail cilium one way, then the other way, in response to chemosensory molecules within its microscopic body.

WILSON, HALF-EARTH, *supra* note 37, at 206. We must keep this complex system alive.

³¹¹ “[W]e stumble forward in hopeful chaos, trusting that the light on the horizon is the dawn and not the twilight. Ignorance of the future based on lack of self-understanding is, however, a dangerous condition.” *Id.*, at 49. He then quotes French writer Jean Bruller on World War II’s eve: “[A]ll of mankind’s troubles are due to the fact that we do not know what we are and cannot agree on what to become.” *Id.*

³¹² Human survival represents life for all of us. “Life is not something, it is the opportunity for something.” FRANKL, *supra* note 274, at 50 (quoting Christian Friedrich Hebbel (1813-63), German poet and dramatist). Thus, we face an opportunity.

³¹³ *See* WALLACE-WELLS, *supra* note 47, at 7 (“on the scale of human life itself”); *Id.* at 136-38 (noting the depths of depression and PTSD caused by warming). As for repetition, consider the increase of hurricane incidence in the Atlantic basin (“The record-breaking 2020 hurricane season produced 30 named storms.” *Facts + Statistics: Hurricanes*, INS. INFO. INST., <https://www.iii.org/fact-statistic/facts-statistics-hurricanes> (last visited, July 11, 2021)) and the increasing incidence of California wildfires (“In 2020 there were 58,950 wildfires compared with 50,477 in 2019, according to the National Interagency Fire Center. About 10.1 million acres were burned in 2020, compared with 4.7 million acres in 2019.” *Facts + Statistics: Wildfires*, INS. INFO. INST., <https://www.iii.org/fact-statistic/facts-statistics-wildfires> (last visited, July 11, 2021)).

faced before. With the risks of climate change and with the changes needed to reduce those risks, we must transform toward the new view of ourselves.

It sounds frightening, but it is not. We need to reconstruct the way we think, to aid the human spirit. We need to avoid fatalism and giving up on fighting climate change and other significant risks. As psychologist Viktor Frankl noted, “any spiritual reconstruction” can be made more difficult with a “sense of fatalism.”³¹⁴

Let us start by considering fatalism’s cause. We need to avoid nihilism, pessimism, and skepticism,³¹⁵ or we leave the door open to self-destruction.

Instead, we will need to focus on processes that will keep us alive. We need safety, and we need to pull together as “in a single garment of destiny”³¹⁶ to unite humanity. By working together as one, we will find ways to meet human need. Enduring the process will help us leave the old and “strive toward a new humanity.”³¹⁷

The corona virus has taught us to stick together, not physically so much as cooperatively. Many of us have changed our behaviors to weather the pandemic. We want to live, each of us—and presumably all of us.

Someone who makes the decision to take the life of another denies the law’s most basic right, the right to life. This is the same right to life upon which each of us depends every day. We must take it seriously.

Ultimately, humanity will need to address the question of whether to pursue the survival of the human species. To pursue survival, we must protect our planetary life support system.³¹⁸ (If we do not do so soon, it may not matter.³¹⁹) We must engage all arenas of human study, especially

³¹⁴ FRANKL, *supra* note 274, at 23.

³¹⁵ *See id.* at 25.

³¹⁶ “We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly affects all indirectly.” Rev. Dr. Martin Luther King, Jr., *Letter from Birmingham Jail*, U. PA. AFR. STUD. CTR. (Apr. 16, 1963), https://www.africa.upenn.edu/Articles_Gen/Letter_Birmingham.html.

³¹⁷ FRANKL, *supra* note 274, at 25. The “old” represents death. For Frankl, the old was life in a series of Nazi death camps. For us, the old represents everyday stress connected with the looming risk of being cooked to death by the fires of climate change.

³¹⁸ “[O]ur future wellbeing depends intimately on the wellbeing of the living world around us.” Richard Horton, *Offline: Planetary health’s next frontier—biodiversity*, 390 LANCET 2132, 2132 (Nov. 11, 2017). “In time, the mapping of Earth’s biodiversity will become a Big Science project, comparable to cancer research and the brain activity map prevailing at the present day.” WILSON, HALF-EARTH, *supra* note 37, at 158.

³¹⁹ Professor Wilson shares his view of the urgent choice we face:

If humanity continues its suicidal ways to change the global climate, eliminate ecosystems, and exhaust Earth’s natural resources, our species will very soon find itself forced into making a choice, this time engaging the conscious part of our brain. It is as follows: Shall we be existential conservatives, keeping our genetically based human nature while tapering off the activities inimical to

science, religion, and law. Briefly, we will need to live in a world with less consumption, less pollution, and a lower human population. To succeed, we must find ways to do this together cooperatively, as a larger group.³²⁰

Extinction is no answer. Nor is it worthy of focus on when we seek to avoid it. It is too frightening. Fearing a loss absorbs too much attention and is counterproductive.³²¹ Consider the examples of skiing and fencing.

When skiing downhill, is it better to aim for the open space or to focus on the trees and on trying to avoid them? Multiple obstacles arise in quick succession. One finds that one cannot process them fast enough to succeed without looking for the open spaces. One succeeds better by aiming for what one wants than by trying to avoid what one does not want.

When fencing with an epee, are you more likely to be successful by focusing on touching your opponent or by focusing on avoiding being touched? The answer, provided to me years ago by a law student who had competed on the 2009 Women's Pan Am Epee Team,³²² is the former. The better strategy is to focus on how to win, not on how to avoid loss.

Avoiding extinction by tackling problems *seriatim* may ignore systemic causation and is more likely to fail sooner than focusing on what will affirmatively lead to our own survival. "We have already left behind the narrow window of environmental conditions that allowed the human animal to evolve in the first place, but not just evolve—that window has enclosed everything we remember as history, and value as progress and study as politics."³²³ We are now outside the window; we must live on new terms.

ourselves and the rest of the biosphere? Or shall we use our new technology to accommodate the changes important solely to our own species, while letting the rest of life slip away? We have only a short time to decide.

Id. at 207.

³²⁰ Humanity will need something more than a "Covenant of Peace." (Ezekiel XXXVII.) Professor Wilson observes that, despite our efforts thus far, the rate of loss of species to extinction is accelerating. Consequently, "[i]f biodiversity is to be returned to the baseline level of extinction that existed before the spread of humanity, and thus saved for future generations, the conservation effort must be raised to a new level." Wilson explains how: "[The solution] requires a fundamental shift in moral reasoning concerning our relation to the living environment." WILSON, *HALF-EARTH*, *supra* note 37, at 167.

³²¹ Any one of the twelve categories of risk enumerated by Jared Diamond (*supra* note 3, at 487-96) could kill millions in the next fifty years. This is a gross oversimplification. According to Diamond, "The single most important problem is our misguided focus on identifying our single most important problem. ... [T]hey all interact with each other. If we solved 11 of the problems, but not the 12th, we would still be in trouble, whichever was the problem that remained unsolved." *Id.* at 498.

³²² See *2009 Women's Pan Am Epee Team*, MUSEUM OF AMERICAN FENCING, <http://museumofamericanfencing.com/wp/2009-womens-pan-am-epee-team/> (last visited July 11, 2021).

³²³ WALLACE-WELLS, *supra* note 47, at 35.

Wallace-Wells believes there will be retribution for our failure to protect our life support system.³²⁴ Thus, protecting our life support system will be one of the terms of our new existence. When we accept those terms, we will need new systems and new laws to help us succeed.

This brings us to the possibility of achieving a more positive mindset in the face of dreadful climate issues. We can reframe our choices.

A. Reframing

Instead of dreading risks, we need to re-frame our vision. Instead of worrying about avoiding loss, we should instead seek a positive goal.³²⁵ As with sports psychology, our choice needs to be affirmative, or the approach will be less effective.³²⁶ The positive can be expressed in many ways.

Whatever the goal, it—and its reciprocal responsibilities—must apply to all.³²⁷ No person should be able to deny this obligation. To do so would deny and harm the rights to life and health of each and every human.

Can there be such a thing as a new moral principle? Sure. We can come up with a new one. But that does not change the old principles.³²⁸

Regarding the protection of human rights, all of our rights, we must be one. Decisions at the group level apply at the individual level as well. The question of survival at the individual level is stark and basic according to Albert Camus's 119-page essay, *The Myth of Sisyphus*: "There is just one truly important philosophical question: suicide. To decide whether life is worth living is to answer the fundamental question of philosophy.

³²⁴ The force of retribution will cascade down to us through nature, but the cost to nature is only one part of the story; we will all be hurting. I may be in the minority in feeling that the world could lose much of what we think of as "nature," as far as I cared, so long as we could go on living as we have in the world left behind. The problem is, we can't.

Id. at 36.

³²⁵ "People understand and prefer goals." WILSON, *HALF-EARTH*, *supra* note 37, at 4.

³²⁶ Being positive has a positive effect. See Kristin Layous et al., *What Triggers Prosocial Effort? A Positive Feedback Loop Between Positive Activities, Kindness, and Well-Being*, 12 J. POSITIVE PSYCH. 385 (2017); John B. Nezlek et al., *Within-Person Relationships Among Daily Gratitude, Well-Being, Stress, and Positive Experiences*, 20 J. HAPPINESS STUD. 883 (2019).

³²⁷ We need collective responsibility, an "ethics of care," as a foundation for governance. Martha Albertson Fineman, *Universality, Vulnerability, and Collective Responsibility* (Jan. 4, 2021), for 16:1 LES ATELIERS DE L'ÉTHIQUE/THE ETHICS FORUM. Special Issue: "After Covid": ethical, political, economic and social issues in a post-pandemic world (Winter 2021) (peer reviewed), <https://ssrn.com/abstract=3869039>, at 6.

³²⁸ For example, we already have the moral principle of sustainability. After adopting a new principle of, say, supporting human survival first, the basic concept of sustainability would remain unchanged. What may change is how and when sustainability is invoked.

Everything else ... is child's play; we must first of all answer the question."³²⁹ Given our current situation, we, as a species, need to answer this question, as it is more than foreseeable that our systems will take us down³³⁰—unless we, all of us together, decide to live.

You already know the answer. You want to survive—or you would not be here. It is comforting to believe that most people likely feel that way as well. As Ronald Dworkin observed, “We believe ... that a premature death is bad in itself, even when it is not bad for any particular person.”³³¹

Although it is arguable, one can decide, based on individual right, to take one's own life,³³² even if it is a senseless waste.³³³ However, one does not (normally³³⁴) possess the right to make that decision for another. And if the other is unaware of the risk? Most of us would acknowledge that behavior contributing (substantially) to foreseeable and significant survival risks to others should not be permitted. However, our situation requires more than mere acknowledgment.

To date, we have assumed that our species will survive. It has even been assumed by the likes of Ronald Dworkin.³³⁵

I hope, think, and believe we all agree that the human species should survive.³³⁶ Those who do not agree to this principle should speak out. Let

³²⁹ ALBERT CAMUS, *NOTEBOOKS 1951–1959*, at 31 (Ryan Bloom trans., Ivan R. Dee 2008).

³³⁰ If it is not failure of political systems causing nuclear annihilation, it could well be failure of our energy systems to adequately limit emissions that cause intense warming. Humanity is so large and so well developed that, in fact, we represent an entire system. The COVID-19 pandemic has devastated that system. See Matías Pérez Mendoza, *Utopía del Lekel Kushlejal (Vida Plena)/Lekel Kushlejal Utopia (Full Life)*, 68 *UCLA L. REV. DISCOURSE* 156, 173 (2020).

³³¹ DWORKIN, *supra* note 108, at 69.

³³² This decision fails to recognize the harm visited on family and loved ones. Suicide remains illegal in most states. See Scott P. Johnson & Robert M. Alexander, *The Rehnquist Court and the Devolution of the Right to Privacy*, 105 *W. VA. L. REV.* 621, 642 n.178 (2003); David LaValle, Note, *Physician-Assisted Suicide: Is There a Right to Die?*, 31 *SUFFOLK U. L. REV.* 944, 953 n.73 (1998). Christianity has treated suicide as morally worse than murder. See ARENDT, *supra* note 123, at 316.

³³³ Here is psychologist Viktor Frankl's view: “[T]he one thing that is certainly senseless and has absolutely no meaning is ... to throw away your life. Suicide is in no way the answer to any question; suicide is never able to solve a problem.” FRANKL, *supra* note 274, at 41. “Suicide ... flouts the rules of the game of life; these rules do not require us to win at all costs, but they do demand from us that we never give up the fight.” *Id.* at 42.

³³⁴ E.g., we are neither considering the right of family to make end-of-life decisions for a loved one nor are we considering acts of self-defense.

³³⁵ See DWORKIN, *supra* note 108.

³³⁶ The existence of mankind is “the first imperative.” JONAS, *supra* note 289, at 43.

them argue against the survival of the human species. Let them argue in favor of “the end.” They should not get very far. How come?

The alternative that they offer is far worse than surviving. Failing to attempt to survive appears at this point to be a self-fulfilling prophesy. Do we not owe it to ourselves and to those who got us here to try?

We can no longer merely assume that humanity will survive. We must act. To do so, we must formalize the decision to act. We need to embed the survival of the human species in our law—as a fundamental principle for all. For most everyone to want something and for that not to be a common decision either demonstrates a failure of logic or it lights the way to a wonderful opportunity.

Our values need to be consistent with the reality of the world. Using science and law to protect life is a necessary reality and a concept consistent with working to preserve and protect a future of the human species.

We may opt for holism and holistic coherence.³³⁷ Human survival, as a theory and principle, provides just that. With a focus on a future for all of us, it draws us all together. We all matter, and with integrity, we become one. It should be obvious by now: What happens in, for example, Wuhan Province of China matters here. And here is everywhere on Earth. We are already connected by our own DNA, by our own behaviors, by our own organizations, and by our own diseases. Now we need to learn to act as one.³³⁸ Survival will likely require that—and more.

We benefit when we see the climate crisis as a moral opportunity. Much of our inherited (religious and cultural) morality tells us that we must do something: “However we choose to respond, a response is necessary.”³³⁹ Religion, in this case the Archbishop of Canterbury, was right to step up. Pope Francis³⁴⁰ and the Dalai Lama³⁴¹ have done so as well. If climate

³³⁷ “*Holism* (from Greek ... ‘all, whole, entire’) is the idea that various systems (e.g. physical, biological, social) should be viewed as wholes, not merely as a collection of parts. The term ‘holism’ was coined by Jan Smuts in his 1926 book *Holism and Evolution*.” *Holism*, <https://en.wikipedia.org/wiki/Holism>. Holistic coherence theory relies on the whole truth. See Charles B. Cross, *Probability, Evidence, and the Coherence of the Whole Truth*, 103 SYNTHESIS: INT’L J. EPISTEMOLOGY, METHODOLOGY & PHIL. SCI. 153, 168 (1995). Science is probably as close as we can get to the whole truth.

³³⁸ Richard Falk observes that “nonparticipation and oppression go together even if ‘the oppressor’ adheres to a benign creed.” RICHARD A. FALK, THIS ENDANGERED PLANET: PROSPECTS AND PROPOSALS FOR HUMAN SURVIVAL 310 (1971). Thus, *being as one* cannot be forced. Resulting insurrections may carry significant risk.

³³⁹ Justin Welby, *Our Moral Opportunity on Climate Change*, N.Y. TIMES (Nov. 3, 2017), <https://www.nytimes.com/2017/11/03/opinion/faith-climate-change-justin-welby.html>.

³⁴⁰ See Francis, Encyclical Letter *Laudato Si’* 16–43 (May 24, 2015), <http://www.vatican.va/content/francesco/en/encyclicals/documents/papa->

change is a moral opportunity, religions should step up. Religions tend to have a moral component.³⁴²

But if we limit the moral opportunity to religions, we overlook secular morality. For example, consider choosing a new diet for health or moral reasons not tied to religion.³⁴³ Healthy diets can increase life expectancy and cut agricultural emissions, particularly of methane.³⁴⁴ We can support a rewarding life by being healthier and by eating healthier.³⁴⁵

How we see things matters. Factors other than positive and negative views may make a huge difference.

It is no secret that how one sets one's mind (framing and determination) has a great deal to do with one's probability of success in a chosen endeavor.³⁴⁶ Individuals go to tremendous efforts to reach goals, from mountain climbing to Olympic glory to an emergency lift of an auto.³⁴⁷ If

[francesco_20150524_encyclica-laudato-si.html](https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_encyclica-laudato-si.html); Francis, Encyclical Letter Fratelli Tutti 18-24 (Oct. 3, 2020), http://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20201003_encyclica-fratelli-tutti.html.

³⁴¹ See DALAI LAMA & FRANZ ALT, *OUR ONLY HOME: A CLIMATE APPEAL TO THE WORLD* 21-22 (2020).

³⁴² See Karl-Wilhelm Merks; *From 'Group Morality' to 'World Ethos': The universality of morality in the perspective of moral theology*, in DOES RELIGION MATTER MORALLY? A CRITICAL REAPPRAISAL OF THE THESIS OF MORALITY'S INDEPENDENCE FROM RELIGION 9 (Jan Jans trans., Kok Pharos, 1995). Certainly though, morality extends beyond religions. See Kai Neilsen, *God and the Basis of Morality*, 10 J. RELIGIOUS ETHICS 335 (1982).

³⁴³ Food is an important part of cultural preservation. See Steph Tai, *In Fairness to Future Generations of Eaters*, 32 GEO. ENVTL. L. REV. 515, 517-18 (2020). As cultural preservation cannot outweigh the survival of the species, cultural preservation will need to give way in areas of significant risk.

³⁴⁴ See Hyunju Kim et al., *Plant-Based Diets Are Associated With a Lower Risk of Incident Cardiovascular Disease, Cardiovascular Disease Mortality, and All-Cause Mortality in a General Population of Middle-Aged Adults*, 8(16) J. AM. HEART ASS'N, <https://www.ahajournals.org/doi/10.1161/JAHA.119.012865> (Aug. 7, 2019) (Diets higher in plant foods and lower in animal foods were associated with a lower risk of cardiovascular morbidity and mortality in a general population).

Reducing meat and dairy consumption will produce less methane and thereby cause less climate damage. See Johan Karlsson et al., *Future Nordic Diets: Exploring ways for sustainably feeding the Nordics*, NORDIC COUNCIL OF MINISTERS 29-30 (Dec. 5, 2017), https://issuu.com/nordic_council_of_ministers/docs/tn2017566_web.

³⁴⁵ Cutting wasted calories reduces the cultural epidemics of obesity and diabetes.

³⁴⁶ Kahneman and Tversky's prospect theory predicts that people's choices will differ depending on whether the outcomes are gains or losses. See Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision under Risk*, 47 ECONOMETRICA 263 (1979). Positivity seems to reduce the number of risky choices. See Paul M. Miller & N.S. Fagley, *The Effects of Framing, Problem Variations, and Providing Rationale on Choice*, 17 PERSONALITY & SOC. PSYCH. BULL. 517 (1991).

³⁴⁷ See Clifford Lo, *Passers-By Join Forces to Lift Seven-Seater Car and Free Trapped Hong Kong Crash Victim, 71, In Heroic Rescue Effort*, S. CHINA MORNING POST (Dec. 3,

we are driven, we act.³⁴⁸ Although liberty considerations make internal driving forces seem preferable to external ones, education is a powerful external force representing a huge opportunity for humanity.³⁴⁹

And when a number of people pull together, something dynamic can happen. Consider the energy and impact of Civil Rights marches.

Picture multiplying our individual energies by 7.5 billion.³⁵⁰ Imagine the combined energy, and all the possibilities. They become more hopeful if we are working together, as one species. It is possible, because generally, we all want the same thing. Life is an ongoing effort for each and every one of us, but enjoying life itself is also a daily goal that many of us embrace. Finding the right mix or recipe would be an important advance.

We need hope. When facing a daunting situation, hope can help make anxiety and depression from facing environmental challenges more bearable.³⁵¹ Success stories may help,³⁵² but even numerous success stories may not adequately offset the grind of staring into the abyss of multiple overlapping, reinforcing, and sometimes contradictory significant risks to the survival of humanity. We need something stronger to give us hope.

We need an aim. However, if one frames it wrong, one is more likely to aim it wrong. Decision-making that aims us over a cliff, bears an increased probability of significant risk to the human species. If we frame our decision-making on narrow, non-universal terms (e.g., the profit motive), our decision-making can aim us to maximize when doing so is not safe. Such framing may encourage us to explore all physical bounds and limits to their very brink,³⁵³ with little regard for the enormity of the risks at hand. We must consider that enormity. As we evaluate risks, each occasion of

2020, 2:43PM), <https://www.scmp.com/news/hong-kong/transport/article/3112386/passers-join-forces-lift-seven-seater-car-and-free-trapped>. Lifting a car shows that together we can achieve greater goals than by acting alone.

³⁴⁸ However, Americans, especially, dislike being told what to do by someone else. Unless we want to do it, we are in trouble. We each must want humanity to survive for the effort to succeed. Division will interfere with cooperation and increase our risk of failure.

³⁴⁹ With modern cellphone technology, education could influence millions overnight.

³⁵⁰ “Small acts, when multiplied by millions of people, can transform the world.” HOWARD ZINN, *YOU CAN’T BE NEUTRAL ON A MOVING TRAIN: A PERSONAL HISTORY OF OUR TIMES* 208 (1994, Beacon Press repr., 2002).

³⁵¹ When studying environmental law, we can build hope into our view of reality to minimize our anxiety and depression. See Lynda Margaret Collins & Brandon D. Stewart, *Engendering Hope in Environmental Law Students* (Apr. 10, 2020), <https://ssrn.com/abstract=3572751>.

³⁵² *Id.*

³⁵³ Humanity has a history of encouraging more risk. See ULRICH BECK, *WORLD RISK SOCIETY* 55 (1999). The trouble is that we do not know exactly where we are relative to the risks at hand. See Draper, *Neo-Classical Economics*, *supra* note 26, at 165.

framing in the course of decision-making needs to include a risk filter.

B. Re-Aiming

We need a new vision. Extinction is not the answer. Only in the face of doom must we accept that fate.³⁵⁴ It is not necessary for all of humanity to die off prematurely. We must change our direction to avoid our apparent fate. Instead of aiming to avoid loss, we should aim for a more positive goal, a transcendent goal.³⁵⁵

We need to aim, but we must apply the concept to a group, world's largest group. Therefore, it must be an aim that we can share freely.

Social movements constitute one example of groupthink. Other examples could include shared concepts, ideals, or norms, or movements within disciplines or within all of academia.

Consider, e.g., the profit maximization mantra of neo-classical economics. Maximization of profit is a common ideal in business schools. Much of the field of financial economics believes that maximized profit represents an ideal. In this view of risk, it is all about the money. Here we have an example of people thinking alike and possibly working together toward the same result. Unfortunately, this ideal will kill us.

Should we instead shift from risk analysis to resilience analysis? Philosopher Terje Aven observes that resilience analysis and management is already “an integrated element of the field and science of risk analysis”³⁵⁶ and that “risk analysis is still needed to increase relevant knowledge, develop adequate policies, and make the right decisions....”³⁵⁷ Resilience analysis may need to vary based on the size, quantity, and nature of the risks. We need a wide view of risk and resilience.³⁵⁸ Resilience may reflect

³⁵⁴ See FRANKL, *supra* note 274, at 39.

³⁵⁵ “[T]ranscendent goals—above self and tribe—do arise in the human brain. They are fundamentally biological in origin. To understand the meaning of life, to know that we know and how and why we know, is the premier driving force of all of science and humanities.” WILSON, *HALF-EARTH*, *supra* note 37, at 50.

³⁵⁶ Terje Aven, *The Call for a Shift from Risk to Resilience: What Does it Mean?*, 39 RISK ANALYSIS 1196, 1202 (2019).

³⁵⁷ *Id.* at 1196.

³⁵⁸ Resilience analysis has developed as a reaction to narrow risk analysis. It has a rationale, as resilience is a main system feature influencing safety and risk. Two trends are now observed. The first is a growing separation between risk analysis and resilience analysis (“the different schools perspective”): here the other community is to a large extent ignored. It is a development that is counterproductive. Neither risk nor resilience can be properly analyzed and managed without thinking about both risk and resilience. *Id.* at 1202. Separating thinking and studies into siloed camps may diminish resilience.

the ability to bend and recover from various risks.³⁵⁹ If our systems bend too much or too often, that may contribute to significant risk. Remember that resilience is a means, not an end.

1. A New Ideal?

We need a new ideal that will help transform the human system into one that lasts. We need a future. As philosopher Dupuy observes, “The only Archimedean point available to us is the future itself—the thing whose continuing existence we wish to assure.”³⁶⁰ This is the value and the hope of a new focus for the human species.

We need law with a purpose, a most basic purpose or end. That end must attract cooperation and cause transformation.³⁶¹

The opposite of extinction is survival. Instead of avoiding death, we need to aim for life, not the life of one but the life of all. We should aim for survival of the human species and the life support system on which we depend. Significant risks will be relevant as bases for change. The aim will not be to solve individual risks so much as aim to reduce or avoid them.

Why should the species aim to survive? Our best course is to aim. There are only two possible choices, aim or not. There is no tyranny of choice here.³⁶² We do not face too many choices. And one of the two involves exposing humanity to significant risk of failure.³⁶³ The other aims for safety. Ask yourself: Which one should I choose?

For those who value safety, the aim of human survival has appeal. If one chooses any other philosophy, one will not win against the principle of human survival. There is no more important consideration than a safe future for humanity. We have a mutuality of interest in reducing risks to life.³⁶⁴ Through safety in numbers, the principle of human survival will prove the logical choice for those who value safety. Cohesiveness is employed. We band together, we think it through quickly, and we try.

We can start by considering the literature of safety in philosophy, law, and science. We could also study the social psychology of safety. We face the world’s greatest public health problem. The question is how we will

³⁵⁹ “Traditionally, the resilience field has focused on regaining the performance of the system, but recently, the improvement aspects have also been highlighted.” *Id.* at 1201.

³⁶⁰ DUPUY, *supra* note 4, at 60.

³⁶¹ Transformative or adaptive law is needed at the global level, or we face more significant risks to the survival of humanity. See Shalanda H. Baker, *Adaptive Law in the Anthropocene*, 90 CHI.-KENT L. REV. 563, 579-82 (2015).

³⁶² See BARRY SCHWARTZ, *THE PARADOX OF CHOICE: WHY MORE IS LESS* 2-3 (2004).

³⁶³ Failure, human extinction, is morally repugnant.

³⁶⁴ See Draper, *Ranking Rights*, *supra* note 26, at 165.

respond to the question of our own survival. The question remains open.

2. Respecting Basic Rights

The human situation is both novel and urgent.³⁶⁵ Each of us has an interest³⁶⁶ in life. Those interests justify the rights that each of us hold, actual rights requiring respect. Failure to respect the rights of all, billions of us, to continued life—even the mere attempt—would be a crime against humanity on a scale far beyond the six million who died in the holocaust. Even if accomplished in the name of liberty, property rights, maximized profit, or other duties, the taking of lives is criminal. Such crimes against humanity are already punishable in international criminal law.³⁶⁷ We must actively protect basic rights, especially the most basic, the right to life.

3. A Secular Health Decision

When the life of a person is at risk, does the physician attempt to save that life or not? When a precious species is at risk, does the biologist attempt to save it or not? There is no question. Physicians and biologists focus on possible means to save a precious life or species.

The decision to survive is a secular health decision based on the rights of each and every one of us. It requires similar thinking. It requires no particular profession or religion. While Ronald Dworkin says, in many ways, it is already assumed,³⁶⁸ he also describes the underlying concerns:

[W]e treat it as crucially important that we survive not only biologically but culturally, that our species not only lives but thrives. That is the premise of a good part of our concern about conservation and about the survival and health of cultural and artistic traditions. We are concerned not only about ourselves and in others now alive, but about untold generations of people in centuries to come.³⁶⁹

However, the aim to survive as a species has not been implemented. What

³⁶⁵ “For the first time in human history, the decisions we make will determine whether the species survives. That has not been true in the past. It’s very definitely true now.” CHOMSKY, *supra* note 53, at 98.

³⁶⁶ Interests are personal values. See DWORKIN, *supra* note 108, at 73.

³⁶⁷ See discussion of the international criminal common law of the Nuremburg Trials. Draper, *Ranking Rights*, *supra* note 26, at 230 n. 584.

³⁶⁸ See DWORKIN, *supra* note 108, at 76.

³⁶⁹ *Id.* at 77.

is our destiny? Will we try? How shall we think about this?

We need “a philosophy that makes preserving the future the foremost priority of mankind.”³⁷⁰ Irreversibility, combined with the incommensurable nature of and interest in life itself, gives meaning to the aim of human survival.³⁷¹ That aim is meant to be an “ethics for the future,”³⁷² and that philosophy must regard the human future as a functional priority. In doing so, we must change our laws, our science, even some religions—to aim for survival—to enable human endurance.

Humanity’s greatest achievement then would be its endurance. As a survivor, Viktor Frankl put it this way: “[I]n the final analysis it is not a question of either achievement or endurance—rather, in some cases endurance itself is the greatest achievement.”³⁷³ There is an achievement in suffering through endurance.³⁷⁴ Despite the inevitable suffering, deciding as a species, even as a health decision,³⁷⁵ to live, sounds worthwhile.

The survival of the human species needs to be a secular decision. It must not be associated with any one religion.³⁷⁶ The position of this Article is based largely on findings in science and not in the teachings or understandings of any one religion. Any parallels between any religious teaching or thought and this argument are purely coincidental.

4. An Inclusive Priority

The survival of the human species should be a priority. It rises to the top. I challenge the reader to find a greater priority, a more important one. A more significant one? I contend that the survival of the human species wins as a consideration. Every time.

There is no greater consideration or interest. It pertains to everyone. To succeed, it must apply to any human anywhere. Providing one is human,

³⁷⁰ DUPUY, *supra* note 4, at 10.

³⁷¹ See Draper, *Risk Filters*, *supra* note 199, at 332.

³⁷² JONAS, *supra* note 289, at 27.

³⁷³ FRANKL, *supra* note 274, at 40.

³⁷⁴ See *id.* at 40-41.

³⁷⁵ [Health risks] often involve complex and unfamiliar topics, surrounded by unusual kinds of uncertainty, for which individuals and groups lack stable vocabularies. Health risk decisions also raise difficult and potentially threatening tradeoffs. Even the most carefully prepared and evaluated communications may not be able to eliminate the anxiety and frustration that such decisions create.

Baruch Fischhoff et al., *Risk Perception and Communication*, 14 ANN. REV. PUB. HEALTH 183, 200 (1993).

³⁷⁶ Yet, in some ways, the survival of the human species needs every religion, for religious resistance to survival stands a reasonably foreseeable chance of succeeding if religions decide to support an alternative to survival.

there must be no geographical evasion—or evasion of responsibility.³⁷⁷

What could be more important than our collective survival? Your wishes? Mine? Hardly.

A company's need for financial success? More important than the lives and futures of all of us? That would be preposterous.

One country's wishes? More important than the lives of all the rest of us?! That is appalling. Should any discipline, subject matter, or activity be exempt or protected from reconsideration and re-aiming? To do so would leave an opening for significant risk to the lives and health of all of us.

What about the traditional teachings of deeply conservative or orthodox religions? Houses of worship may not take lives.³⁷⁸ If the teachings would effectively take the lives of others, let alone everyone else, it may serve us well to bear in mind that criminal charges have been filed against dangerous cults.³⁷⁹ We may need to re-examine when secular law should limit the behavior of religious groups. Religious teachings should not risk our collective survival—or the important considerations to get us there. In any event, the secular and sacred³⁸⁰ hopes, desires, interests, and rights of billions of innocent people *to survive* must be honored.³⁸¹

³⁷⁷ Vulnerability theory might help here: “[V]ulnerability theory is a theory of essential (not voluntary or consensual) social cohesion and reciprocity. It is based on the recognition and acceptance of human beings’ inevitable dependence on social relationships and institutions and the collective responsibility for those relationships and institutions that dependence entails.” See Fineman, *supra* note 327, at 7.

³⁷⁸ “Health Director Gibbie Harris said she ordered the buildings [of the United House of Prayer for All People] closed beginning at 10 a.m. Saturday after 121 confirmed cases of the [COVID-19] virus and at least three deaths were linked to the church.” Joe Marusak, *All United House of Prayer Buildings Ordered Closed Over ‘Grave’ COVID-19 Concerns*, CHARLOTTE OBSERVER (Oct. 24, 2020, 10:55 AM, Updated Oct. 24, 2020 12:56 PM), <https://www.charlotteobserver.com/news/local/article246679802.html#storylink=cpy>.

The recent Supreme Court decision, *Roman Cath. Diocese of Brooklyn v. Cuomo*, is inapplicable as it involved regulations treating “houses of worship much more harshly than comparable secular facilities.” *Roman Cath. Diocese of Brooklyn v. Cuomo*, No. 20A87, slip op. at 2 (Nov. 25, 2020) (per curiam).

³⁷⁹ See Joe Tacopino & Priscilla DeGregory, *Cult Leader Arrested For Allegedly Branding Women, Keeping Them as ‘Slaves,’* NY POST (Mar. 26, 2018, 6:11PM, updated Apr. 25, 2018, 7:13PM), <https://nypost.com/2018/03/26/cult-leader-arrested-for-allegedly-branding-women-keeping-them-as-slaves/>. According to Professor of Religion Winston Davis, “When religious groups engage in criminal activities, public officials should waste no time wondering whether a move against them poses a threat to religious freedom. The first and foremost obligation of public officials is people's safety.” Winston Davis, *Dealing With Criminal Religions: The Case of Om Supreme Truth*, CHRISTIAN CENTURY, July 19-26, 1995, at 708, 711.

³⁸⁰ “Something is sacred or inviolable when its deliberate destruction would dishonor what ought to be honored.” DWORKIN, *supra* note 108, at 74.

³⁸¹ The law does not permit singling out individuals for death to possibly preserve the

This is a human rights question writ large. The human future is of sacred importance,³⁸² even if it is rooted in secular scientific theory and involves changing some of our own behavior. As Ronald Dworkin points out, “Almost everyone shares, explicitly or intuitively, the idea that human life has objective, intrinsic value that is quite independent of its personal value for anyone....”³⁸³ Dworkin further notes that the Supreme Court has held that human “lives have intrinsic value—are sacred—even if it is not in their *own* interests to continue living.”³⁸⁴ Our future ought to be treated as sacred as well.³⁸⁵ The sanctity of life is based on not wanting to frustrate the previous efforts and investments that have already been made.³⁸⁶ If we fail, we will have thrown it all away—and in the process our systems and our law will have failed to help us avoid significant risk. We need to look ahead and consider taking risk avoidance actions earlier.

Our philosophy and our psychology of survival are intertwined. How we think about survival and how we should think behaviorally about it are most closely related. How we think about re-aiming and maintaining that aim may be the only thing more difficult than experiencing the alternative.

Understand that the degree and variety of significant risks we face mean that this cannot be treated as a mere three-month epidemic. Unlike the COVID-19 pandemic, we cannot even hope that the effort will be over soon. It is realistic to hope that someday we can coast in some areas, but first we must make it up the steep hills that we have built for ourselves.

We are a global population facing global risks, and we must respect the

lives of others unless there is an emergency and lots have been drawn. See *U.S. v. Holmes*, 26 F. Cas. 360, 367 (C.C.E.D. Pa. 1842 No. 15,383). Preserving the lives of billions is also clearly a matter of international law.

³⁸² “Our concern for future generations is not a matter of justice at all but of our instinctive sense that human flourishing as well as human survival is of sacred importance.” DWORKIN, *supra* note 108, at 78.

³⁸³ *Id.* at 67.

³⁸⁴ *Id.* at 12 (citing *Cruzan v. Director, Missouri Department of Health*, 497 U.S. 261 (1990)). “Something is intrinsically valuable ... if its value is independent of what people happen to enjoy or want or need or what is good for them.” *Id.* at 71.

³⁸⁵ Here is philosopher Dupuy’s characterization of our obligation to the future:

The future is that which lies beyond us, an external lever that permits us to raise ourselves above ourselves, as it were; that permits us to discover a point of view from which we will be able to survey the history of our species, and perhaps also succeed in giving it meaning. The future is that which we ought to hold sacred: it may be good or bad, without our being able to know which in advance; in either case are obliged to show toward it the same consideration, the same devotion that a different conception of holiness inspired people in earlier times to show toward their divinities.

DUPUY, *supra* note 4, at 60-61.

³⁸⁶ See DWORKIN, *supra* note 108, at 99.

rights of each human. We each have the right to life; let us recognize that right by protecting it first. We can do that now.³⁸⁷ But humanity needs and deserves more protection than a restatement of individual rights. We need systems to avoid or reduce significant risks—before the foreseeable harms go out of control. The findings of science indicate that they are overdue.

How we ought to think about survival most cooperatively is probably best described as a matter of framing. Until we look at something as a matter of life and death, we tend not to see it that way. The discovery can be a rather stark and horrifying.³⁸⁸

The group aim for survival is a moral choice, both secular and scientifically informed, requiring no particular religious belief or activity to exercise. That choice and the decisions that go with it must be scientifically informed, for without that input, we should expect additional significant risk. Science must analyze significant risks as part of an effort to remove, reduce, or avoid the risks, often through education and social change.

Science must also speak to law—better than it has. Using choices,³⁸⁹ defaults,³⁹⁰ and laws to help establish and meet a duty of non-interference with human survival³⁹¹ will help humanity last longer.

This tips you off to the kind of thinking necessary to use law to protect the human species. The big issues are new, but many of the problems are old. For now, let us reframe the question. How might humanity use law in an aim to survive?³⁹² That will be the next Article.

³⁸⁷ See Draper, *Ranking Rights*, *supra*, note 26, at 189.

³⁸⁸ It takes a strong exposition of risk to get peoples' attention. See e.g., RACHEL CARSON, *SILENT SPRING* (1962); RALPH NADER, *UNSAFE AT ANY SPEED: THE DESIGNED-IN DANGERS OF THE AMERICAN AUTOMOBILE* (1965); and the more recent fearsome jolt of seeing freezer truck morgues in the pandemic. These difficult realities cannot be classified to affect only "somebody else." Everyone bears some additional risk. More importantly, with greater perceived risks, one is more likely to feel risk. See Daniel Västfjäll et al., *Affect, Risk Perception and Future Optimism After the Tsunami Disaster*, 3 *JUDGMENT & DECISION MAKING* (January 2008), at 64. There is an unwelcome reality in mortality. In that lies the opportunity to frame the opportunity to survive.

³⁸⁹ See Richard H. Thaler et al., *Choice Architecture*, in *THE BEHAVIORAL FOUNDATIONS OF PUBLIC POLICY* 428 (Eldar Shafir ed., 2013).

³⁹⁰ See Micha Kaiser et al., *The Power of Green Defaults: The Impact of Regional Variation of Opt-Out Tariffs On Green Energy Demand in Germany*, 174 *ECOLOGICAL ECON.* 106685 (2020), <https://doi.org/10.1016/j.ecolecon.2020.106685>.

³⁹¹ The behavioral aspect of the challenges of Part I, *supra*, will require the recognition of a new duty aimed at human survival.

³⁹² I have already advocated legal limits for economics (Draper, *Neo-Classical Economics*, *supra* note 26, at 249), new decision filters to replace CBA (Draper, *Risk Filters*, *supra* note 199, at 323-26, 342-44), and ranking the right to life above liberty and property rights in a lexical priority of Due Process rights (Draper, *Ranking Rights*, *supra* note 26, at 193). These are significant parts of what I will offer. We will also need to

VI. CONCLUSION

I have introduced you to an array of risks posed before our future as a species. It was an incomplete outline of some of the risks that we can see. One may not agree with the position or view of a particular finding—or its implications. But with the apparent global nature of new risks (think COVID-19, but deadlier³⁹³), we must respond with governance that is effective at the global level. If we are to attempt to solve global problems, we need to respond with legal structures and systems designed to operate at the global level. Given the significant risks to our species, humanity needs to address global risks at the global level—or we increase risk of failure.

If you want to attack this position, just remember: You are attacking your own future; your own legacy; your own offspring—and the collective future of all of us. No consent form will work for you here. Ultimately, you will be asked to support human survival.

Each of us will have a choice. More important than whether is how. Remember: Each of us is counting on the other. And each of us has something to offer. We must learn to trust each other—and to cooperate. Our future is as bright as we decide to make it. To structure ourselves and our response, we need to systematize our response to significant risk. And in some manner, we need to embed a system in our law—and fast. Although it will not be easy, we need to turn on a dime.³⁹⁴

Science is telling us if we do not pay attention to where we are and to the risks at hand, no one will be around to regret the loss of what we had—and threw away. It will be sad. We, all of us, humanity, had so much ability—only to each end up starving, suffocating, or suffering heat stroke. We were blessed. And we knew what to do to unlock our future. But we did not use the key. We will be gone. And we didn't even try?

That's why.

invoke duties that correlate to ranking survival as humanity's highest goal.

³⁹³ COVID-19 was merely a “wake-up call.” See Miriam Berger, *Covid-19 'not necessarily the big one,' WHO warns*, WASHINGTON POST (Dec. 29, 2020), <https://www.washingtonpost.com/world/2020/12/29/coronavirus-2020-the-big-one-who-pandemics/>.

³⁹⁴ “Rarely do firmly established institutional missions and cultural prerogatives turn on a dime.” Sarah Phillips, *Resourceful Leaders: Governors and the Politics of the American Environment*, in A LEGACY OF INNOVATION: GOVERNORS AND PUBLIC POLICY 25, 26 (Ethan G. Sribnick ed., 2013).