SLOW HOPE

Rethinking Ecologies of Crisis and Fear

Christof Mauch

Transformations in Environment and Society

2019 / 1

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Preface

I first mentioned the concept of "slow hope" four years ago in a lecture in Seattle at the University of Washington's W. C. Simpson Center for the Humanities. My talk focused on sustainability but, to my surprise, I received half a dozen messages with inquiries about the idea of slow hope, which I had mentioned only in passing. The term resonated with an audience who was seemingly tired of listening to long streams of frightening stories—about climate change, migration, violence, and extinction. Under no circumstances should we downplay the threat of ecological change and vast potential catastrophe. We do not need unadulterated optimism. But pessimistic stories about climate determinism and imminent collapse can be just as dangerous because they have the potential to paralyze us. What we need, I think, is hope: hopeful narratives that help us think creatively and act unflinchingly. We need to be fully aware of the crises that humans and other animals face on the planet. But we also need to identify starting points and signposts that can direct us into an alternative future.

After my talk in Seattle, I had a chance to elaborate the idea of slow hope further, first in Beijing at a conference in honor of Donald Worster, and later in various other places, including at one of the Rachel Carson Center's Works-in-Progress sessions, and at the Center for Environmental History at the Australian National University.[1] I have profited from the input of Carson fellows and friends, and I want to thank them for their valuable comments. I would also like to thank my colleagues Hannah Roberson, Pavla Šimková, and Claudio de Majo who read the manuscript carefully and helped to prepare it for publication. Above all I want to thank Katie Ritson, the Carson Center's managing editor, who urged me to publish this essay as part of our *Perspectives* series.

1 As a result, shorter versions of this essay have appeared in Chinese and Italian journals: "Shi jie ji duo cui ruo? Huan jing ke chi xu xing yu dui wei lai huan huan er zhi di xi wang" 世界几多脆弱？环境可持续性与对未来缓缓而至的希望, trans. Liu Xiaohui, *Zhong hua du shu bao* 中华读书报 [Chinese Reading Weekly] 31 August 2016, 13; "Quanto è vulnerabile il nostro mondo? La crisi ecologica ed una lenta speranza per l'umanità," trans. Claudio de Majo, *Siculorum Gymnasium* 70, no. 3 (2017): 43–72, available online at http://www.siculorum.unict.it/views/home/article-detail.php?id=247.

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Tomorrow it will be too late. The world as we know it won't exist anymore. Traffic lights will fail and cause accidents. Nighttime passengers in airplanes will see the Earth below them suddenly turning black. Food will rot as refrigerators run out of power, and hospital patients will start dying as their life support machines fail. There will be a complete power failure—in Rome, in Zürich, in Europe, and in China.

This is the scenario that Austrian novelist Marc Elsberg created in his 2013 thriller *Blackout: Morgen ist es zu spät* ("tomorrow it will be too late").[2] The eight-hundred-page novel describes the collapse of the European power network as a result of a hacker attack. It catapulted Elsberg, an almost unknown author, to instant fame. The book appeared on the SPIEGEL list, Germany's principal bestseller list, and stayed there for months; iBooks listed *Blackout* as one of the top ten "must reads" for the summer of 2013; and the popular science magazine *Bild der Wissenschaft* called Elsberg's novel the most exciting science book of the year ("Wissenschaftsbuch des Jahres").[3]

Elsberg's story is haunting, it is apocalyptic, and it reminds us of the original meaning of the word catastrophe: a term for the abrupt and often shocking plot twist with which classical Greek tragedies are resolved. *Blackout* taps into the anxieties of our time. It became an immediate success in several European countries, and particularly in Japan, a country that had been struck by multiple disasters in the years before the book's publication. The novel's success is due not least to its message: it is a story about the vulnerability of our world. It is a piece of fiction but not far from reality. In fact, the Office of Technology Assessment in the German parliament was discussing the very scenario that Elsberg describes, at the time when Elsberg was working on his book.[4] Moreover, the most severe, large-scale blackouts in history have all occurred in the twenty-first century. One of them—in 2012 in India—affected 620 million people. And the financial losses resulting from the 2003 blackout in North America amounted

2 Marc Elsberg, *Blackout: Morgen ist es zu spät* (München: Blanvalet, 2012).

3 Matthias Iken, "Wenn der Strom ausfällt," *Hamburger Abendblatt,* 30 January 2013, 6. Available online at https://www.abendblatt.de/kultur-live/article113229279/Wenn-der-Strom-ausfaellt.html.

4 Thomas Petermann, Harald Bradke, Arne Lüllmann, Maik Poetzsch, and Ulrich Riehm, *Gefährdung und Verletzbarkeit moderner Gesellschaften – am Beispiel eines großräumigen Ausfalls der Stromversorgung,* (Berlin: Büro für Technikfolgen-Abschätzung, 2010), http://www.tab-beim-bundestag.de/de/pdf/publikationen/berichte/TAB-Arbeitsbericht-ab141.pdf.

to about $6 billion.[5] Indeed, much of the darkness of Elsberg's dystopian novel was deemed plausible by critics from the science community. In other words, Elsberg's novel is not only an expression of the disorientation and fears of our time. It illustrates the real-life risks of rapidly escalating failures and collapse.

Since around the turn of the millennium, book and video stores have been filling with titles that showcase scenarios of disaster and apocalypse, and movies like *The Day after Tomorrow*—in which global warming triggers abrupt and devastating climate change—have become instant blockbusters around the globe. Moreover, websites like EcoInternet have prophesied a series of upcoming catastrophes in articles with alarming titles such as "The Coming Climate Famine Anarchy," "Time of Great Dying," "Grotesque Global Inequity Threatens Ecological Collapse," or "Horrific Death for All."[6] All of these stories are driving home a similar message: we are naïve—naïve to think that the world is safe. They tell stories of negligence and of a false sense of security. Stories of vulnerability, and of disaster that we have brought upon ourselves, from which there is no place to hide.

Where do these stories—and our fears—come from? And can we find arguments for hope in a vulnerable, overpopulated, and increasingly self-destructive world?

Risk, Vulnerability, and Ecological Traps

Prometheus, the Titan who stole fire from the gods for humanity, may be a useful icon for the key dilemma of humankind. As a punishment for stealing, Prometheus had to suffer the torture of an eagle tearing his liver from his immortal body day after day. The Titan's story reminds us that bringing something positive—fire and its comfort and the technological advances it enabled—to humans had a negative side as well. Prometheus's story is the ultimate story of risk and of vulnerability.

The myth of Prometheus is age-old. This suggests that there is something universal, perhaps biological or anthropological, about the human drive toward daring and risk-

5 José R. Martí, "The AC Electrical Grid: Transitions into the Twenty-First Century," in "Energy Transitions in History: Global Cases of Continuity and Change," ed. Richard W. Unger, *RCC Perspectives* 2013, no. 2, 78, https://doi.org/10.5282/rcc/5602.

6 The EcoInternet articles listed here were all published between September and December 2017. https://ecointernet.org/category/general-sustainability/.

taking. Thus, before I look at the cultural context I would like to ask how natural scientists would explain the Prometheus syndrome.

Laconic bowl from c. 550 BCE showing Prometheus's punishment. Photo by Karl-Ludwig Poggeman, via Wikimedia Commons (CC BY 2.0).

In 2007, a leading environmental scientist and doyen of German ecology, Wolfgang Haber, spoke to an international audience on the occasion of the EcoSummit in Beijing, a conference dedicated to the theme of "Ecological Complexity and Sustainability." On this occasion, Haber argued that the lessons—later on he called them "inconvenient truths"[7]—from ecology "demonstrate that human evolution in about 1.5 million years has taken an ecologically wrong, even fatal course."[8] Like all biological beings, humans are following their survival instincts and are driven by "competition, the general organizing principle of life on Earth." This has allowed them to expand and multiply. It has brought them comfort. But it has also caused them to make "evolutionary mistakes" which made them extremely vulnerable and led them into what he calls "ecological traps."[9]

In the course of his career, Haber discussed several ecological traps, and I will briefly focus on three of them: the energy trap, the food trap, and the industrial trap. All three of these are closely related to the Promethean myth—to fire, and human control of fire. When humans started to migrate from Africa across the globe, the most important thing they brought with them was fire. Fire allowed our ancestors hundreds of thousands of years ago to move to colder places, outside of the tropics. Fire scared wild animals away and enabled humans to come out of the trees. By using fire to cook food, we were able to eat things other than plants and foliage (salads, if you will, with some insects mixed in). Fire helped to detoxify foods and to kill bacteria, and it turned us

7 Wolfgang Haber, *Die unbequemen Wahrheiten der Ökologie. Eine Nachhaltigkeitsperspektive für das 21. Jahrhundert* (München: oekom Verlag, 2010).
8 Wolfgang Haber, "Energy, Food, and Land: The Ecological Traps of Humankind," *Environmental Science and Pollution Research* 14, no. 6 (2007): 359.
9 Haber, "Ecological Traps," 359.

into cooks. Fire and cooking made us human—more than anything else, more than language even. In fact, we can be defined as "cookivores."[10]

Over time we developed an increasing affinity with wood as a building material and especially as a source of energy, until it was superseded in industrial societies by other building materials and energy from fossil fuels. Altogether, fire helped us to improve our standard of living. But with the discovery that burning woody plants would provide us with fuel, we created an irreversible dependence on one particular natural resource. This was the very first step into the energy trap. Even today more than three billion people use open fires for cooking and for heating; over four million people die prematurely each year from illness attributable to the ensuing household air pollution.[11] We became more entangled in the energy trap with each new discovery—peat, coal, and petroleum. All of them—while enhancing our comfort, progress, and mobility—caused more, and more serious, environmental problems.

Second, the food trap. Like the discovery and use of fire, the transition to farming also helped humans to secure their sustenance and brought about a steady increase in the human population. Fertility was considerably higher among farmers than among hunters and gatherers, and infanticide and starvation decreased. More people were able to live on less land. But with the transformation of "untouched" nature into cultivated land came new fetters, new dependencies. Instead of diverse diets from a variety of plants and animals, we have come to depend instead on a dwindling number of species of crops and livestock. The scale of loss of agricultural biodiversity which started during the Neolithic Revolution, when people first discovered how to domesticate animals and to cultivate crops, is enormous. With rising populations and the tendency towards cultivating high-yielding varieties, plant and livestock diversity is being lost irreversibly and at an ever faster speed. Growing in intensive monocultures also entails the use of herbicides and pesticides, which destroy many of the other plant and animal organisms in agricultural ecosystems. Of more than a quarter of a million known edible plants, humans today use less than two hundred.[12] More than 75 percent

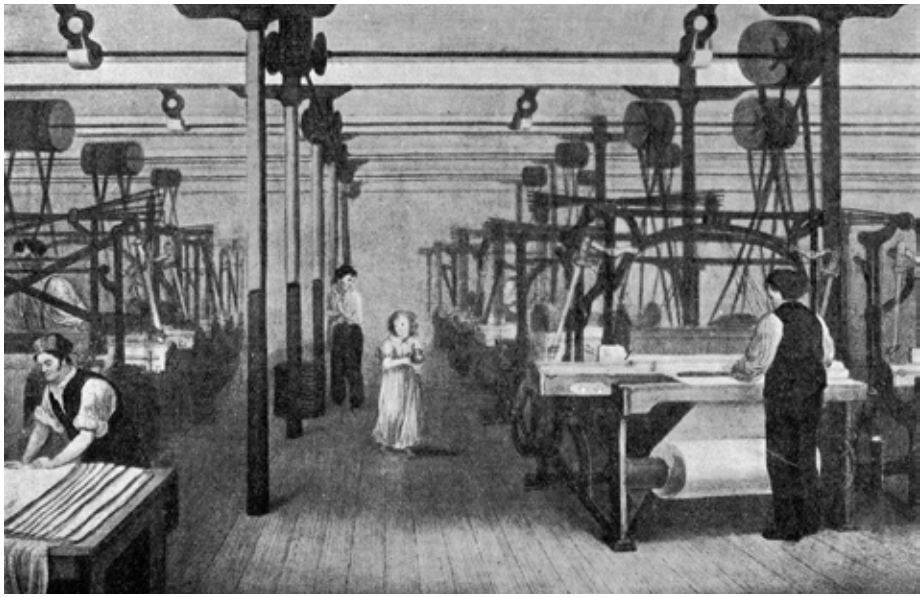
10 Cf. Richard W. Wrangham, *Catching Fire: How Cooking Made Us Human* (New York: Basic Books, 2009).
11 "Household Air Pollution and Health," World Health Organization Fact Sheet N°292, last modified February 2016, http://www.who.int/mediacentre/factsheets/fs292/en/. More than 50 percent of premature deaths due to pneumonia among children under five are caused by the soot inhaled from household air pollution.
12 FAO, *Women: Users, Preservers and Managers of Agrobiodiversity* (Rome: Food and Agriculture Organization of the United Nations, 1999), 2. Available online at http://www.fao.org/docrep/x0171e/x0171e03.htm.

of the world's food comes from only 12 plant and 5 animal species.[13] Many of the crops that we rely on—coffee and corn, tobacco and tea, rice and wheat, palm oil and soy—contribute to soil erosion. The use of large machinery and pesticides in modern times has endangered or destroyed much of the fragile skin of the earth from which all life develops. In fact half of the planet's topsoil—which in itself is a vulnerable ecosystem supporting countless species—has disappeared within the last 150 years.[14]

We stepped into a third ecological trap with industrialization and the shift to coal around the turn of the eighteenth century. The ability to mine for coal, and later on for oil and gas, on a large scale—as well as the development of the combustion engine and of the electric grid—has made human habitats more livable. They have created enormous wealth (for some) and spurred the development of new types of capital-intensive methods of harvesting, mining, and production. All this went hand in hand with large-scale and often aggressive imperial expansion. Europeans expanded—as colonizers and aggressors—into almost every part of the world, China and Japan being a notable exception.[15] The availability of non-renewable energy resources was a precondition for this expansion, and for the introduction of technologies—from automobiles to drones—that led the way into all the major ecological traps whose implications and effects we experience today. They include the alteration of landscapes, air pollution, enormous amounts of waste, and climate change.

With each transition, from hunting and gathering to farming, and from agrarian to industrial economies, the human population continued to rise—and ever more quickly. With the industrial transition and the seemingly endless availability of cheap energy, our population grew from one billion in 1800 to two billion in 1930, four billion in 1975, and over seven billion today. Hunting had long ago contributed to the extinction of large vertebrates, and farmers and ranchers had begun the process of ploughing up wildlife habitats and turning them into pasture for cattle, but the developments that began with industrialization went far beyond that. The last two centuries have seen a previously unheard of transformation of the planet's land mass. More than 77

13 FAO, *What Is Agrobiodiversity*? (Rome: Food and Agriculture Organization of the United Nations, 2004). Available online at http://www.fao.org/docrep/007/y5609e/y5609e01.htm#bm1.
14 World Wildlife Fund, *Soil Erosion and Degradation*, https://www.worldwildlife.org/threats/soil-erosion-and-degradation.
15 "By the way, in today's ecology," says Wolfgang Haber, "we often discuss the harmful consequences of invasive alien species threatening native species. But I have never heard of anyone taking the human subspecies of Europeans as an example of harmful invaders." Haber, "Ecological Traps," 362.



Interior of cotton factory showing use of child labor. Credit: Wellcome Collection (CC BY 4.0).

percent of the Earth's land (excluding Antarctica) and more than 87 percent of the ocean has been modified by humans; 20 countries contain more than 94 percent of the world's remaining wilderness.[16] According to Vaclav Smil, a Canadian environmental scientist, only about 5 percent of the large terrestrial vertebrates on our planet are wild animals like lions, zebras, and rhinoceroses. The rest are the creatures that we raise and breed—goats and sheep, pigs and cows—and of course ourselves, *Homo sapiens*. A recent study analyzing the biomass of all organisms—including viruses—concludes that humans make up just 0.01 percent of all life; viruses have a combined weight three times that of humans and the same is true for worms; but humans have destroyed 83 percent of wild mammals.[17] And Canadian geographer Tony Weis in his monograph *The Ecological Hoofprint* argues that the commodification of animals, the industrial production of livestock, and what he calls the "meatification of our diet" has

16 James E. M. Watson, Oscar Venter, Jasmine Lee, Kendall R. Jones, John G. Robinson, Hugh P. Possingham, and James R. Allan, "Protect the Last of the Wild," *Nature* 563 (2018): 27–30; Will Steffen, Angelina Sanderson, Peter Tyson, Jill Jäger, Pamela Matson, Berrien Moore III, Frank Oldfield, et al., *Global Change and the Earth System: A Planet under Pressure* (Berlin: Springer, 2004), 81–141.

17 Vaclav Smil, "Harvesting the Biosphere: The Human Impact," *Population and Development Review* 37, no. 4 (2011), 613–36, https://doi.org/10.1111/j.1728-4457.2011.00450.x; Yinon M. Bar-On, Rob Phillips, and Ron Milo, "The Biomass Distribution on Earth," *Proceedings of the National Academy of Sciences* 115, no. 25 (2018): 6506–11, https://doi.org/10.1073/pnas.1711842115.

created not only vast environmental degradation (through increased energy consumption, water use, pollution, deforestation, and oilseed monocultures) but also worsening human inequality across the globe.[18]

The growth of the human population has been most devastating for our fellow earthlings that is, for vast numbers of animals and their habitat. The rise of the human population and the loss of global biodiversity are inextricably linked to one another. If represented graphically, they form curves that once ascended slowly but have become increasingly steep in recent decades. The German philosopher Gregory Fuller suggested in 1993 that the dominance of one species, humans, would lead to the swift demise of all other species; this is on verge of becoming reality.[19] Some scholars, most famously Elizabeth Kolbert in her book on the Sixth Extinction, predict the extinction of up to 50 percent of all living species on Earth by the end of this century.[20] Moreover, the world around us is becoming increasingly synthetic. This is certainly true for the animals that we have created for food and other specialized functions—from turbo cows to farmed fish (the majority of them full of antibiotics), and from bacteria to insect larvae. But it is also true for the synthetic and often toxic substances that we use to spray and fertilize much agricultural land. And plastics, mostly made from synthetic polymers, are now appearing in both marine and terrestrial sedimentary deposits, creating a lasting legacy on the Earth's surface. If we joined together all of the plastic bags that we use every day, they would form a line long enough to go round the equator 14 times.[21] And this is even without considering the habitats we have built for ourselves out of metal and concrete, the vehicles that carry us across the planet, the electrical grids that power our lives, the satellites and cell phones and computers upon which our daily activities depend and which demand increasing amounts of dangerous heavy metals for batteries and electronics. Our dependence on the synthetic world has made us vulnerable should these objects fail and it is damaging the environment that we rely on.

The most common scientific understanding of life is a mechanical one: that of reproduction. The prime purpose of humans and all other animals on the globe is survival. We hu-

18 Tony Weis, *The Ecological Hoofprint: The Global Burden of Industrial Livestock* (New York: Zed Books Ltd., 2013).
19 Gregory Fuller, *Das Ende: Von der heiteren Hoffnungslosigkeit im Angesicht der ökologischen Katastrophe* (Leipzig: Ammann Verlag, 1993), 9.
20 Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Henry Holt & Company, 2014), 17.
21 "The Downfall of the Plastic Bag: A Global Picture," *Earth Policy Institute*, 1 May 2014, http://www.earth-policy.org/plan_b_updates/2014/update123.

mans have, however, been so perfect in reproducing ourselves that our survival mechanism is turning against us. Indeed, through our biological success—and its counterpart, selfishness and greed—we are running the risk of destroying the very base of our lives.

Human Power and Human Fears

The awareness of our far-reaching impact on our environment is one of the reasons why scholars, most notably the chemist and Nobel laureate Paul Crutzen, have called for the designation of a new epoch in the history of the planet, our epoch, the "age of humans," the "Anthropocene."[22] This term—not a very beautiful word—expresses the assumption that recent human activity in the natural world has affected the Earth's crust more significantly than volcanic eruptions, tsunamis, and earthquakes.

The Anthropocene is a recent invention. What is intriguing about this concept is the currency it has gained within a short time, in culture, in politics, and across almost every academic discipline and sub-discipline. The fascination with this term, I argue, is an expression of our fears.

It is important to understand that what we fear today is very different from what we feared in early modern times. We are no longer afraid of the wildness of the mountains, of the torrents of the seas, or of attacks from fierce animals. We have "tamed" our natural environments and we have extinguished wild animals or confined them to small spaces. Our fears today—such as those expressed in Elsberg's *Blackout* scenario—are different. In engineering and exploiting and transforming our habitat we have opened tens of thousands of Pandora's boxes. We fear the breakdown of the electric grid, the end of non-renewable resources, the expansion of deserts, the loss of islands, and the pollution of our air and water.

22 Paul J. Crutzen, "Geology of Mankind," *Nature* 415 (2002): 23, https://doi.org/10.1038/415023a; Christian Schwägerl, *Menschenzeit: Zerstören oder gestalten? Die entscheidende Epoche unseres Planeten* (München: Riemann Verlag, 2010); Jan Zalasiewicz, *The Earth After Us: What Legacy Will Humans Leave in the Rocks?* (Oxford: Oxford University Press, 2008); Paul J. Crutzen, Mike Davis, Michael D. Mastrandrea, Stephen H. Schneider, and Peter Sloterdijk, *Das Raumschiff Erde hat keinen Notausgang: Energie und Politik im Anthropozän* (Berlin: Suhrkamp, 2011); Helmuth Trischler, ed., "Anthropocene: Envisioning the Future of the Age of Humans," *RCC Perspectives* 2013, no. 3, https://doi.org/10.5282/rcc/5603.

Potteries landscape, source unknown. Credit: Wellcome Collection (CC BY 4.0).

These fears are the result of our own power. We fear that whatever we do to improve our condition can also trap us. We fear—as paradoxical as this may seem—both our own power and our powerlessness vis-à-vis our own power. No other creature on this earth has been more successful in the competition for habitat and resources than humans, but we are now starting to realize that our success has come at a high price: that of our vulnerability or, if we describe it in terms of the Prometheus story, continuous suffering.

Our fears are a reflection of the fact that we have radically changed the world around us and that abysses—or ecological traps—open themselves up where we had hoped we could gain more safety, more food security, more comfort. We are biological beings, and like other animals, and especially large mammals, we are following our instincts. However, we also have an intellectual and emotional capacity that we use in our struggle for survival and well-being on earth. As a result, we make a conscious effort to push away the negative implications of our actions. At times we bury our heads in the sand and pretend that everything is fine. At other times we are guided by altruism and make every effort to mitigate the damage that we have caused to our environments. But often we simply push the evidence away, and export the problems that we have created. “We” in this case means those of us in the “Western world” or in the Global North who can define risks. Electronic waste from Europe and North America, for example, may travel halfway around the world to cities in Africa or Asia, where it

is processed in order to recover valuable materials—at considerable risk to the health of those who process it. And what about the air quality in Beijing? China is the world's largest emitter of anthropogenic air pollutants. But much of it is related to production for the international market, and more than 20 percent of Chinese air pollution can be attributed to products that are exported from China to the United States alone.[23]

By exporting risks we are covering up the abyss, or the ecological trap, that we have created. We are pushing away the cause of our fundamental fears—fears that are ultimately about our own extinction. After all, according to fossil finds, more than 98 percent of all the species that have ever existed have become extinct. And we, alone among all creatures, are the ones who can reflect upon the possible extinction of our own species.[24]

Acceleration

The fact that "Anthropocene" refers to the human species as a geological agent makes the term especially powerful. It suggests that humankind is about to leave a deep imprint on the Earth—a combination of heaps and holes and furrows, of synthetic substances and toxins. Perhaps most strikingly, all this is happening not over the course of millennia (as was the case in previous geological epochs), but within a few centuries and decades. Acceleration is the signature of our time.[25] And the famous "hockey stick" graph—depicting the sudden rise in CO_2 concentration and in ozone depletion—provides testimony of a drastic transformation of the human relationship with the natural world. Graphic representations of human activity have often shown hardly any increases for thousands of years before they began to increase slowly and

23 Jintai Lin, Da Pan, Steven J. Davis, Qiang Zhang, Kebin He, Can Wang, David G. Streets, Donald J. Wuebbles, and Dabo Guan, "China's International Trade and Air Pollution in the United States," *Proceedings of the National Academy of Sciences of the United States of America* 111, no. 5 (2014): 1736, https://doi.org/10.1073/pnas.1312860111; Simone Müller, "Cut Holes and Sink 'em: Chemical Weapons Disposal and Cold War History as a History of Risk," in "Risk as an Analytical Category: Selected Studies in the Social History of the Twentieth Century," Special Issue, *Historical Social Research* 41, no. 1 (2016), 263–84, https://doi.org/10.12759/hsr.41.2016.1.263-284. Cf. also Christof Mauch, ed., "Out of Sight, Out of Mind: The Politics and Culture of Waste," *RCC Perspectives: Transformations in Environment and Society* 2016, no. 1, https://doi.org/10.5282/rcc/7388.

24 Wolfgang Haber, "Nachhaltige Entwicklung zwischen Notwendigkeit, Tugend und Illusion," in *Die Erfindung der Nachhaltigkeit. Leben, Werk und Wirkung des Hans Carl von Carlowitz*, ed. Dieter Füsslein (München: oekom, 2013), 101.

25 John R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945* (Cambridge, MA: The Belknap Press of Harvard University Press, 2014).

then—since the Industrial Revolution and in recent decades—ever more radically. The steeper the curve, the faster the transformation, the more extreme the acceleration. Acceleration is nothing but the rise of quantity per unit of time. Populations have grown slowly for much of human history and the same is true for economic activity. Ever steeper vectors of economic growth are reflecting unheard of accelerations in recent decades. For thousands of years and well into early modern times, world economies saw no growth at all, but from around 1850 and especially since the middle of the twentieth century, real GDP has increased at an enormous speed. After World War II, foreign direct investments started to go through the roof, and so did vectors of human consumption. In the Middle Ages, households in Central Europe may have owned fewer than 30 objects on average; in 1900 this number had increased to 400 and in 2010 to 10,000. The first McDonald's fast-food restaurant was opened in 1940, in 1955 there were 9, and in 2016 the number had risen to 36,900 in more than 100 countries. Paper consumption rose from about 40 million metric tonnes in 1950 to more than 410 million in 2015. Oil consumption grew 8-fold between 1950 and 2005, and natural gas consumption 14-fold. International tourism was estimated by the United Nations World Tourism Organization at just 25 million international arrivals in 1950. Yet 66 years later this number had increased to 1.2 billion international arrivals per year—a 49-fold increase. The enormous acceleration of human production, consumption, and travel has had effects on the biotic and abiotic spheres and on processes on which humans depend. Large-scale changes in the Earth system are in fact seeing very similar curves of acceleration. This is certainly the case in regard to species extinction, but also to deforestation, increased damming of rivers, the occurrence of floods, the depletion of ozone, and the ecological degradation of ocean systems, and in many other areas as well.[26]

Historically, the speed at which the world has changed began to rise slowly at first, spurred on by technological advances in the eighteenth century, by steam engines, railways, and electricity; but it continued at a mind-boggling rate. Cultural assump-

26 McNeill and Engelke, *The Great Acceleration*; Will Steffen et al., *Global Change and the Earth System*; Hartmut Rosa, *Social Acceleration: A New Theory of Modernity*, trans, Jonathan Trejo-Mathys (New York: Columbia University Press, 2013); McDonald's Corporation, *2016 Annual Report*, March 2017, http://d18rn0p25nwr6d.cloudfront.net/CIK-0000063908/62200c2b-da82-4364-be92-79ed454e3b88.pdf; other data from Statista: The Statistic Portal (https://www.statista.com/), from Worldwatch Institute, State of the World 2010 (http://blogs.worldwatch.org/transformingcultures/wp-content/uploads/2009/11/SOW2010-PreviewVersion.pdf), and from Environmental Facts (https://www.ecocycle.org/files/pdfs/Eco-CycleEnvironmentalFacts.pdf). See also Max Roser "Tourism," published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/tourism.

tions blinded us to the devastating social and ecological effects of these great accelerations: ideologies that obscure limits and cherish the illusion of the endless availability of natural resources. In his most recent book, *Shrinking the Earth: The Rise and Decline of American Abundance*,[27] environmental historian Donald Worster discusses the creed of the United States as the "land of unlimited possibilities" that shaped the American Dream and the belief in a way of life based on abundant resources and happiness through wealth. Today, a posteriori, we can see that ideologies of growth and abundance were not only a blessing. They were a curse as well, because they allowed us to develop the sense—and the philosophy—of a world without limits. They have nurtured great and unsustainable dreams that spread from the New to the Old World, and then outwards in all directions, to Korea and Australia, to Brazil and China. Ideas of boundlessness have covered up the fact that the swift rise in human enterprise—in production and consumption—comes with unintended consequences that lead to ecological traps. They have covered up the fact that one day the planet might not be able to provide enough nutrients and energy for its human population.[28]

There were a few people in the nineteenth century who foresaw the traps that an ideology of abundance combined with enormous industrial growth might lead us into. One of them was Eugène Huzar, who predicted as early as 1857: "As man becomes more involved with industry and uses more coal you can predict that in one or two centuries, crisscrossed by railways and steamships, covered with factories and workshops, the world will emit billions of cubic meters of carbonic acid and carbon oxide, and, since the forests will have been destroyed, these hundreds of billions of carbonic acid and carbon oxide may indeed disturb the harmony of the world."[29]

Huzar's voice was a lonely one and he must have sounded pessimistically naïve to his contemporaries. In hindsight, though, we can see that the idea of unlimited growth and technological acceleration has reached critical limits. As German sociologist Hartmut Rosa points out, technological acceleration is a phenomenon that has infringed on the social sphere as well—with the multiplication of everyday activities, the rise of

27 Donald Worster, *Shrinking the Earth: The Rise and Decline of American Abundance* (New York: Oxford University Press, 2016).

28 Will Steffen, Wendy Broadgate, Lisa Deutsch, Owen Gaffney, and Cornelia Ludwig, "The Trajectory of the Anthropocene: The Great Acceleration," *Anthropocene Review* 2, no. 1 (2015): 81–98, https://doi.org/10.1177/2053019614564785; Will Steffen et al., *Global Change and the Earth System*.

29 Eugène Huzar, *L'arbre de la science* (Paris: Dantu, 1857), 106; quoted in Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene: The Earth, History and Us* (London: Verso, 2016), xii.

multitasking, and the loss of leisure time. The speed of data processing rose by a factor of over one hundred in the twentieth century, and the speed of vehicles—trains versus crewed rockets—has multiplied at a similar rate. "The railroad counts today as a slow and peaceful mode of transportation [. . .] while it appeared to the eighteenth century to be inconceivably fast and damaging to human health." And "certain forms of jazz music" that at one time "were experienced as breathless, hectic, exceedingly fast, machine-like" are today "touted as 'music for tranquil hours' or 'jazz for a peaceful afternoon.'" "The faster movement of humans, goods, messages" and "the revolution of production speeds" are dictating the ever faster speed of our lives.[30] Burnout of the Earth's resources and emotional burnout are related to one another. In a world of accelerated consumption, resource exhaustion reveals itself to be not only a physical but also a sociological and psychological phenomenon.[31]

Looking back with a *longue durée* perspective—all the way back to hominids' very first encounters with fire—it appears that we keep falling for the illusion of stability, the make-believe of firm ground that all too often reveals itself to be quicksand. Not much has changed. If anything, the world around us has become more fragile in recent decades—environmental threats have expanded beyond regional boundaries to have global reach, and most hauntingly, are multiplying at a dizzying rate. On a regular basis we are reminded that we are moving too fast. Mathis Wackernagel and his colleagues at the Ecological Footprint Network tell the media each year that the demand for the goods and services that the globe can provide—fruits and vegetables, meat, fish, wood, cotton for clothing, and carbon-dioxide absorption—exceeds what we can renew. Earth Overshoot Day—the date on which we have used up more than our planet can renew in a whole year—is moving up. Year after year, faster and faster, consumption is outpacing the biological capacity of our planet.[32] Our actions are writing stories of apocalypse and collapse, some of them more haunting—and less prone

30 Rosa, *Social Acceleration*, 74–75, 85; Hartmut Rosa, "Full Speed Burnout? From the Pleasures of the Motorcycle to the Bleakness of the Treadmill: The Dual Face of Social Acceleration," *International Journal of Motorcycle Studies* 6, no. 1 (2010), http://ijms.nova.edu/Spring2010/IJMS_Artcl.Rosa.html.

31 Andreas Meißner, *Mensch, was nun? Wie wir der ökologischen Krise begegnen können* (Münster: MV-Verlag Edition Octopus, 2009); Stefan Brunnhuber, Wolfgang Haber, Karen Hamann, Joachim Hamberger, James Hillman, Marcel Hunecke, Michael Huppertz, Andreas Meißner, Wolfgang Schmidbauer, Klaus Töpfer, *Burnout von Mensch und Erde,* MUTation Band 4 (Freising: Laubsänger, 2017).

32 In 2017, Earth Overshoot Day fell on 2 August, the earliest date since it began to be measured. In 2018, it fell on 1 August. https://www.overshootday.org/newsroom/past-earth-overshoot-days/.

to revisionist criticism—than climate-change novels and films.[33] Stories of accelerated catastrophe are multiplying. They have their legitimacy. But these stories alone, I argue, will not lead us out of ecological crises. We are running out of time, but we cannot outrun the very catastrophe that our accelerated lifestyle and actions have caused.

We will need to find ways that help us flatten the growth curves that reflect our ever faster pace of ecological destruction and social acceleration.

An Argument for Hope

There can be no doubt that biology has set us on a course of natural selection and "selfish genes."[34] But if we acknowledge that human manipulation of the Earth has been a destructive force that has caused huge converging threats, particularly over the last couple of centuries, we can also imagine that human endeavors can help us build a less destructive world in the centuries to come. We may keep falling into ecological traps. Many of our feelings and actions (and even thoughts) may be determined by our genes. But humanity has also been able to learn from past mistakes. Culture has shown itself to exert a strong influence over us and language has played a major role in this. Philosopher Richard Rorty has pointed out that "speaking differently" is more important than "arguing well" when it comes to bringing about change.[35]

What we need, therefore, is not only an acknowledgement of our present ecological predicament but also a language of positive change, visions of a better future—in other words, hope. Ernst Bloch, one of the world's leading philosophers of the future, once formulated that "the most tragic form of loss [. . .] is the loss of the capacity to imagine that things could be different."[36] We need to identify visions and paths that

33 In recent years prominent scientists and critics, including Janet Sawin from WorldWatch Institute, pointed out that films like *The Day after Tomorrow* might "blow a very serious issue out of proportion and could cause people who are skeptical to become even more skeptical." From Stefan Lovgren, "*Day After Tomorrow* Movie: Could Ice Age Occur Overnight?," *National Geographic News*, 18 May 2004, https://news.nationalgeographic.com/news/2004/05/0518_040518_dayafter_2.html. In fact, climate deniers, like Patrick J. Michaels from the Cato Institute, capitalized on this concern and worked to discredit climate change as a "lot of hot air." See Patrick J. Michaels, "'*Day After Tomorrow*': A Lot of Hot Air," editorial, *USA Today*, 24 May 2004.

34 Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1976).

35 Richard Rorty, *Contingency, Irony, and Solidarity* (Cambridge: Cambridge University Press, 1989), 7.

36 Ernst Bloch, *The Principle of Hope*; quoted in Behrooz Ghamari-Tabrizi, "Naming the Revolutionary Moment," *Global-E: Public Imagination Series* 10, no. 57 (August 2017), http://www.21global.ucsb.edu/global-e/august-2017/naming-revolutionary-moment.

will guide us away from past dependencies and traps and into understandings that imagine a different, a more just and more ecological, world. We need not just pessimism or optimism, we need hope. Hope, for Bloch, has its starting point in fear, in uncertainty, and in crisis. In his three-volume magnum opus *The Principle of Hope,* Bloch reminds us of the generative power of hope that has transformed our minds and our worlds throughout history. Hope, according to Bloch, is a creative force that goes hand in hand with utopian "wishful images." It can be found in cultural products of the past—in fairy tales, in fiction, in architecture, in dance, in music, in the movies—in products of the human mind that contain "the outlines of a better world." What makes us "authentic" as humans are visions of our "potential." In other words: living in hope makes us human.[37]

The arts and the humanities have the potential to remind us of past environmental change and positive visions for our environment.[38] What we need, I argue, are narratives of hope. And humanities scholars, in particular environmental historians, can create some of these narratives that will complement (and increasingly counter) the vast number of apocalyptic stories.

Prometheus, the Titan who brought fire, the icon of both daring and vulnerability, had to suffer tremendously for many years before he was rescued by Hercules, who showed up and killed the eagle that was torturing him. The story of Prometheus is helpful as it combines daring and loss and hope. Some of today's scientific narratives about the future seem to suggest that we too will be saved by a new Hercules, a divine engineer, someone who will mastermind, maneuver, and manipulate our planet—through geo-engineering, for instance, or cold fusion, or faster-than-light-spaceships—and thereby transcend once and for all the terrestrial constraints of rising temperatures, a lack of energy, scarcity of food, a lack of space, mountains of waste, polluted water—you name it.[39]

37 Ernst Bloch, *The Principle of Hope* (Cambridge, MA: The MIT Press, 1996), Third American Edition, vol. 2 and 3.

38 This is what Libby Robin, Sverker Sörlin, and Paul Warde have argued in their collection *The Future of Nature: Documents of Global Change* (New Haven, CT: Yale University Press, 2013).

39 Elizabeth Kolbert, "Can Carbon-Dioxide Removal Save the World? CO_2 Could Soon Reach Levels That, It's Widely Agreed, Will Lead to Catastrophe," *The New Yorker*, 20 November 2017, https://www.newyorker.com/magazine/2017/11/20/can-carbon-dioxide-removal-save-the-world. Christopher A. Cokinos is currently working on a book about radical engineering projects, titled *Atlas of the Long Tomorrow: Radical Engineers, A Forgotten Journey and Our Quest for a Better World.*

Yet, if we are looking for another Hercules, or another miracle for that matter, such as a new source of energy with revolutionary potency, we may well be looking in the wrong place. The fact that we now imagine our planet as a whole does not mean that the "rescue" of our planet will come from an ultimate wholesale miracle. If history is a guide then we can assume that any major transformations will once again be followed by a huge set of unintended consequences. Elsberg's novel *Blackout*, fiction though it is, is a reminder that wholesale systems are vulnerable to wholesale threats. We must not forget that our planet is unique not only as a whole but through its multiple and very different habitats. We need individual stories of hope, not stories of unexpected rescues by a larger-than-life hero. After all, Herculean stories do not correlate with our own experiences and they do not empower us as individuals and in the groups that we identify with.

Instead of one big Herculean narrative we need multiple stories: we need dreams, but not another "American Dream" that promises abundance and boundlessness. Future dreams may well include the idea of new frontiers but they will seek reuse as much as use, and restoration as much as extraction. We need stories, not only of the "slow violence" of environmental degradation, but also of what I call "slow hope." Rob Nixon has shown us that oil spills, toxic drifts, and climate change have created violence around the globe. He calls it "slow violence" because it is often invisible and develops slowly and gradually. Nixon argues that we should be more attentive to the damaging impact that environmental change has for people who are vulnerable, poor, and disempowered.[40] Nixon's analysis is perceptive and astute. It helps us understand the creeping character of violence. But, I argue, we also need to identify stories, visions, and actions that work quietly towards a more hopeful future.

40 Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2011).

Ecologies of Slow Hope

Our world is full of—mostly untold—stories of slow hope. They are inspired by anticipation and driven by the idea that things can be different. They are "slow" in their unfolding, and they are slow because they come with setbacks. In a world where developments are evolving ever more rapidly, slowness can be frustrating but also inspiring.

One story of slow hope is that of Tsai Jen-Hui, who served as architect at National Taipei University of Technology and has transformed his university into a green oasis over the last 40 years.[41] I am beginning my narrative inquiry into slow hope with this story because it was Tsai Jen-Hui who made me realize how important a *longue durée* perspective on hope is.

Tsai had the walls of his university's campus torn down; in their place he created a stream that functions like a moat and is fed by recycled water and rain. He gave the university an entranceway that is inspired by—and incorporates—living trees. He created eco-roofs and an eco-balcony that featured species lost to the area; he designed a reservoir and waterscapes along with permeable pavements—all measures to help cool off the campus and to buffer against environmental change. What struck me when I met Tsai Jen-Hui in his tree house on campus a few years ago was not only his incredible vision but also his lament. He recounted his setbacks: the many occasions when university administrators and city officials had rejected his ideas, torn down trees, or demolished some structures. But he failed to realize what he had accomplished since his arrival in Taipei in 1981. In fact, Tsai had redefined the concept of his university as an academic institution by integrating ecological functions into its design: by increasing biological diversity and by strengthening the interconnectedness between people on campus and their environment. Tsai Jen-Hui was driven by a vision that would transform and ecologize not just the campus but also parts of Taiwan's capital. He did not reach his goals but his students and the alumni of his institute are continuing his work. They have designed tree houses and a campanile, and they work beyond the campus as well. A story of slow hope.

41 Jen-Hui Tsai and Yu-Ting Tang, "National Taipei University of Technology Development of Ecological Campus," in *Design for Innovative Value Towards a Sustainable Society*, ed. Mitsutaka Matsumoto, Yasushi Umeda, Keijiro Masui, and Shinichi Fukushige, 1049–54 (Berlin: Springer, 2011); Jen-Hui Tsai, conversation with author in Taipei, 20 October 2015.

The eco campus at National Taipei University of Technology. Photos by the author.

An autobiographical story by environmental historian Franz-Josef Brüggemeier from a different part of the world—Germany's industrial Ruhr district—can illustrate a related point. Brüggemeier tells us that back in the 1970s he was unable to imagine that the Emscher—a drainage canal in the heavily industrialized Ruhr region that was fed with coal slurry—could ever become a river again. Describing his reaction to plans for the renaturalization of the river, he said: "When I first heard about this project, it seemed to me less a visionary dream than a crazy, impossible one. By contrast, I considered the plans being made around this time to fly to Mars to be entirely realistic." Today, the idea that a former river can be turned "back into an ecosystem in which fish live and which is safe for humans to bathe in again seems practically within our grasp."[42] After half a century there is slow hope. The renaturalization of streams and rivers is happening around the world, mostly in response to hydromorphological degradation and the insidious poisoning of water: that is, as a reaction to crisis. But where it happens, the improvements to human livelihoods and more-than-human ecologies are fascinating.

It would be naïve to assume that global change happens quickly. But the case of a green university campus or of the renaturalization of the Emscher can be inspiring

42 Franz-Josef Brüggemeier, "Place, Time, and Me," in "Making Tracks: Human and Environmental Histories," ed. Christof Mauch, Helmuth Trischler, Lawrence Culver, Shen Hou, and Katie Ritson, *RCC Perspectives* 2013, no. 5, 105, https://doi.org/10.5282/rcc/5642.

way beyond Taipei or Dortmund. In that respect the fact that news and stories travel ever faster is in itself a reason for hope.

It makes sense, I argue, to collect and tell, re-tell, and analyze stories of slow hope while acknowledging that oftentimes these stories do not have a clear beginning, and all of them are open-ended. We need to imagine them in a dialectic way—with crises as the antithesis to a status quo—in which every hopeful synthesis forms a new level. The story of London's air pollution can serve as a case in point. It took a long time before the image of "London fog" that defined England's capital through British novels and thrillers—Sherlock Holmes, Jack the Ripper, and many of their fictitious successors are indelibly associated with London fog—revealed itself to be a myth. Fog was in reality smog or smoke.[43]

After a hundred years of lack of awareness and ignorance, in early December 1952, London was hit by the so-called Great Smog or Big Smoke—the worst air-pollution event in the history of the United Kingdom. Approximately twelve thousand people died prematurely as a result of the Great Smog. Within a couple of years, public initiatives and political campaigns led to strict regulations and new laws including the Clean Air Act of 1956.[44] And over recent decades London, a city known for its "pea-soupers" or thick smog events, has effectively reduced emissions from traffic through the introduction of a Congestion Charge Zone; and an Ultra Low Emission Zone is scheduled to be introduced by 2020. Two generations after the Clean Air Act, London looks much cleaner and there is reason for hope. But we know—and need to acknowledge in this model of a dialectics of slow hope—that Londoners are today exposed to new, damaging types of toxic pollutants known as $PM_{2.5}$. The story of the Great Smog and its longer-term consequences demonstrates that awareness brought about action, and action resulted in change. We have come to understand over the last two generations—and certainly since the publication of Rachel Carson's *Silent Spring*—how closely our technologies and production are linked to invisible forms of destruction and to the health of humans and other species. The dialectics of crisis and awareness and action are important elements of the story. What is happening in London does not necessarily reflect what happens elsewhere. However, if we are cautious rather than

43 Christine L. Corton, *London Fog: The Biography* (Cambridge, MA: Harvard University Press, 2015).
44 Cf. Peter Brimblecombe, *The Big Smoke: A History of Air Pollution in London since Medieval Times* (London: Methuen, 1987).

celebratory, if we keep in mind and teach our children that humans are not powerful stand-alone actors on a stage but creatures whose health and well-being—the function of our lungs, the beating of our hearts, and the happiness of our minds—is intrinsically linked to the particles we breathe and the environment around us, then we have every reason for slow hope.

It is indeed significant to realize that understanding the connections between our bodies and what we consume—from air to food to water—has the potential to change politics and regulations. But it can do more than that. In a very subtle way, what we consume can change how we value the land that produces food; it can even create a sense of belonging. The Slow Food movement is a case in point. Slow Food started in Italy in the 1980s as an oppositional movement to fast food. The rise of swift-service restaurants after World War II had prompted an era of cheap, sterile, industrially produced foodstuffs, made from frozen, precooked, and often inferior ingredients.[45] Piedmont, the location in northwest Italy where the "Slow Food revolution" began under the leadership of Carlo Petrini, had seen a long history of peasant poverty, violence, and resistance to oppression. The movement transformed Piedmont into a region where traditional food cultures—based on native plants and native breeds of animals—would be embraced. Its emblem—a small red snail—signals today a devotion to taste and an appreciation of local and artisan food production. The resistance to the McDonaldization of the world that started in Petrini's birthplace, the small Italian town of Bra, alongside a legendary protest in Rome against methanol-adulterated wine in 1986 were the starting point of the movement. Thirty years later, Slow Food is present in more than 160 countries, poor and rich. It features tens of thousands of projects around the globe; it stands for non-hierarchical politics, for food sovereignty, for the protection of biodiversity, and for sustainable agriculture. There can be no question that the unscrupulous commodification of food and the destruction of foodstuffs will continue to have a devastating impact on soils, livelihoods, and ecologies around the globe. Slow Food cannot undo the steamrolling developments of the global food economy, but it can upset its ideologues, it can "speak differently" and demonstrate that alternative visions and possibilities exist that can liberate local traditions and food cultures, communities, and ecosystems. There is

45 Ilaria Tabusso Marcyan, "Slow Food and Terra Madre: A Conversation with Carlo Petrini on Ecology, Rural Traditions, and New Food Cultures," in *Italy and the Environmental Humanities: Landscapes, Natures, Ecologies*, ed. Serenella Iovino, Enrico Cesaretti, and Elena Past, 150–59 (Charlottesville: University of Virginia Press, 2018); Serenella Iovino, *Ecocriticism and Italy: Ecology, Resistance, and Liberation* (London: Bloomsbury, 2016), 144–50.

The Emscher in Dortmund in 2010. Photo by Tbachman, via Wikimedia Commons.

slow hope in slow food. After all, even in the United States, the "Fast Food Nation," small farms, gardens, and backyards are quickly on the rise. The US Department of Agriculture provides an Urban Agriculture Toolkit, and according to a recent report, American millennials are changing their diets. In 2017, 6 percent of US consumers claimed to be vegan, up 600 percent from 2014.[46] There is slow hope, I argue, if more and more people, not least in the so-called "First World," realize that "eating is," in the words of Wendell Berry, "an agricultural act."[47]

Going back deeper into history, our relationship with forests—widely seen (and for good reason) as one of brutal destruction—carries elements of slow hope as well. In the Middle Ages there was no shortage of timber in most parts of the world, and the cutting down of forests was not seen as a problem. In sixteenth-century Venice, the Venetians, who relied on immense masses of wood for their large fleet, realized that they needed to do more than set aside space for forests that would provide timber for ships. They began to think in terms of time, not space alone. In 1548 they estimated that their current

46 Eric Schlosser, *Fast Food Nation: The Dark Side of the All-American Meal* (Boston: Houghton Mifflin, 2001); "Alternative Farming Systems Information Center," *United States Department of Agriculture*, https://www.nal.usda.gov/afsic/urban-agriculture; "Why the Global Rise in Vegan and Plant-Based Eating Isn't A Fad (600% Increase in U.S. Vegans + Other Astounding Stats)," Food Revolution Network, 18 January 2018, https://foodrevolution.org/blog/vegan-statistics-global/.

47 Wendell Berry, "The Pleasures of Eating," in Wendell Berry, *What Are People For? Essays* (San Francisco: North Point Press, 1990), 145.

inventory could supply enough timber for 30 years. At the same time they realized that with good forest management they would be able to meet the demand for many centuries to come. The idea of preserving resources came out of a concern for the future: a fear of using up resources faster than they could be replenished. Economic interests were at the core of this early-modern understanding of trees and forests.[48] It would take more than three centuries before scientists began to understand that the production of timber (alongside berries, mushrooms, herbs, and venison) is not the only, and possibly not the most important, function of forests. The late nineteenth and early twentieth century saw an increasing recognition that forests serve as habitats for countless animal and plant species that all rely on each other. They take over protective functions against soil erosion and landslides; they make a significant contribution to the water balance as they prevent surface runoff; they filter dirt particles, greenhouse gases, and radioactive substances from the air; they produce oxygen; they provide spaces for recreation and they preserve historic and prehistoric remains. As a result forests were set aside as parks or wilderness areas—and on every continent.[49]

Over time, we have come to understand that cutting down woods in places as remote and diverse as the Siberian *taiga*, the Amazon, or the African Congo has an impact far beyond a particular region. There is some hope in the fact that a slow-growing Swiss company called Precious Woods, which operates in the tropical forests of Latin America and Central Africa (Costa Rica, Nicaragua, Brazil, Gabon, and Congo) and is certified by the International Forestry Council, can be profitable with its concept of radically restrained forest management. No more than one tree per hectare per quarter century may be cut down, according to the company's philosophy and guidelines. And it seems that all actors involved—the company itself, local communities where jobs are created and schools built, and the natural environment—are winners of this approach.[50] Likewise, a children's initiative, Plant for the Planet, that since 2007 has

48 Cf. Karl Appuhn, *A Forest on the Sea: Environmental Expertise in Renaissance Venice* (Baltimore: Johns Hopkins University Press, 2009); Karl Appuhn, "Inventing Nature: Forests, Forestry, and State Power in Renaissance Venice," *Journal of Modern History* 72 (December 2000): 861–89, https://doi.org/10.1086/318548; Christof Mauch, *The Growth of Trees: A Historical Perspective on Sustainability*, trans. Katie Ritson (Munich: oekom, 2014), available online at https://www.carsoncenter.uni-muenchen.de/download/press/rcc-news/140805_mauch.pdf.

49 Cf. for instance Bernhard Gißibl, Sabine Höhler, and Patrick Kupper, eds., *Civilizing Nature: National Parks in Global Historical Perspective* (New York: Berghahn Books, 2012).

50 I am grateful to Christoph von Braun, chair of the Andrea von Braun Foundation, who has brought this company and other similar entrepreneurial endeavors—such as the Globalance Bank—to my attention. http://www.preciouswoods.com/en/home.

advocated the planting of trees around the globe in an effort to reduce the effects of climate change, successfully planted more than 15 billion trees by 2018. Every tree can bind 10 kilograms of CO_2 on average, buying valuable time in the fight against climate change and climate injustice. We have a long way to go, because trillions of trees would be needed to replace long-lost forests and to drastically reduce the effects of climate change. But this initiative is inspiring in its global reach and in how it transforms awareness into action. The vast growth of the Plant for the Planet initiative, alongside the young age of its protagonists, is a strong argument for slow hope.[51]

On a more philosophical level, it is important to note that our view of forests has changed in recent years as we have begun to realize that trees might best be understood as social beings. Peter Wohlleben's book *Das geheime Leben der Bäume*—in which the author combines his own observations as a forester with existing scientific research—suggests a sea change in our view of forests, and indeed, of the relationship between humans and the more-than-human world in general. Wohlleben's text has been translated into more than 30 languages and sold millions of copies. He shares his insights that trees can warn each other of danger through a "Wood Wide Web" of roots and fungi, that they support each other through the sharing of nutrients and information, and that they even keep ancient stumps alive by feeding them solutions of sugars.[52] Thus parallels can be seen between forests and human societies.

The communicative and social affinity between humans and the forest, trees and people, calls into question the long-established division between people, animals, and plants, between living beings and things, between human subjects and nonhuman objects. Along those lines, a novel legal phenomenon, the Rights of Nature, has gained ground in recent years. The idea behind it is that it is not only humans who have rights that can be defended in court, but also the natural environment—nonhuman entities such as trees or forests. In South American countries, "derechos de la naturaleza" have been advocated by indigenous people for a couple of decades. In the Western world, the idea of Rights of Nature goes back to an iconic 1972 article titled "Should Trees Have Standing?" by Christopher D. Stone, an authority in international

51 https://www.plant-for-the-planet.org/de/startseite.

52 Peter Wohlleben, *Das geheime Leben der Bäume: Was sie fühlen, wie sie kommunizieren—die Entdeckung einer verborgenen Welt* (München: Ludwig, 2015). An English translation was published in September 2016 titled *The Hidden Life of Trees: What they Feel, How they Communicate: Discoveries from a Secret World*, trans. Jane Billinghurst (Vancouver: Greystone Books, 2016).

environmental law.[53] Stone, who was well aware of the objections his concept would meet with in public and legal debates, asserted that the dialectical evolution of ideas about rights for the rightless provided an argument as to why rights would eventually be granted to the natural world. He argued that each time in history when people had called for the rights of the "rightless" it was deemed laughable, radical, treasonous. Why did it take so long for women, slaves, children, or minorities to gain rights? Because until the rightless had gained their rights, they were seen simply as objects or "things" that could be "used" by those who already held rights. So why should nature not have rights? To some extent Christopher Stone has been proven right by historical developments. In 2008, a generation after his essay first appeared, Ecuador became the first country in the world to incorporate "derechos de la naturaleza" into its constitution. Inspired by indigenous ideas of Mother Earth (*Pachamama*) and of living well (*Sumak Kawsay* or *buen vivir*) rather than living better, Ecuadorian lawmakers acknowledged the right of nature to go unharmed. In this paradigmatic shift, nature changed from being held as property to being an entity that bears rights. Under Ecuadorian law, people can now sue on behalf of a harmed ecosystem even if there is no direct harm to humans.

A couple of years after Ecuador, Bolivia followed suit, with the people of these countries as the defenders of ecosystems. In 2011, the Provincial Court of Loja, Ecuador, granted a Constitutional injunction in favor of nature for the first time, specifically for the Vilcabamba River, against the Provincial Government of Loja. The widening of a road, the court argued, had violated the rights of nature by increasing the river flow and potentially provoking disasters for the vulnerable riverside populations who utilize the river's resources.[54] There have been setbacks since and it seems that the US couple who originally advocated for the rights of the river have since used their success in court to sell riverside properties for development. But the idea of the Rights of Nature, which around the year 2000 was but a faint notion, is now entering public consciousness and gaining ground around the world, most recently through the success of a documentary film *The Rights of Nature: A Global Movement* produced by Hal Crimmel and Valeria Berros, former fellows of the Rachel Carson Center, in coopera-

53 Christopher D. Stone, "Should Trees Have Standing? Toward Legal Rights for Natural Objects," *Southern California Law Review* 45 (1972): 450–501.

54 Natalia Greene, "The First Successful Case of the Rights of Nature Implementation in Ecuador," *Global Alliance for the Rights of Nature*, http://therightsofnature.org/first-ron-case-ecuador/; Alan Pierce, "If Corporations Have Rights, Why Doesn't Nature?" *Pachamama Alliance,* 11 January 2013, http://www.pachamama.org/blog/if-corporations-have-rights-why-doesnt-nature.

tion with Issac Goeckeritz.[55] Some years ago, New Zealand's Whanganui River was declared a person, the Ganges was granted human rights, and even some cities, such as Santa Monica, California, have written the Rights of Nature into their ordinances.[56]

As a quotation attributed to British philosopher John Stuart Mill reminds us: "Every great movement must experience three stages: ridicule, discussion, adoption."[57] Movements for the Rights of Nature that are springing up today in many communities around the globe will, no doubt, face opposition and obstruction, but there is hope—hope that will endure through knock-backs and breakthroughs, slow hope, that is—that understanding and empathy for nonhuman creatures will widen and that over time both sentiments for and rights of nature will have a broader basis.[58] Our relationship with the natural world has evolved over time and recounting this historical and dialectic evolution can serve as a promise and a reason to expect a better future.

The movement for the Rights of Nature has evolved as a subversive idea challenging long-held views. It has received inspiration, notably from indigenous understandings that travel faster in the twenty-first century than ever before. Another subversive idea—that of Gross National Happiness (GNH)—has seen a similar rise and expansion around the globe. It originated in the 1970s in Bhutan, one of the poorest and smallest nations on the planet, as a counter-concept to the Western capitalist economic measure of Gross Domestic Product (GDP). Bhutan's enforcement of its national policies has unfortunately been anything but exemplary—while the country placed the natural world and its protection at the heart of its education, it also discriminated brutally against its ethnic Nepalese Hindu population—but over the last couple of decades, the Buddhist-inspired movement that calls for happiness instead of material wealth as a measure of well-being has gained traction. National and international organizations—from Thailand's Green and Happiness Index to the United Nations World Happiness Report, and from Gallup's Well-Being Index to the United Kingdom's well-being and happiness statistics—have adopted the idea that the intense focus on GDP in Western

55 *The Rights of Nature: A Global Movement,* directed by Issac Goeckeritz, Hal Crimmel, and María Valeria Berros (USA: IG Films, 2018, 52 min.).

56 David R. Boyd, *The Rights of Nature: A Legal Revolution that Could Save the World* (Toronto: ECW Press, 2017); panel discussion with Hal Crimmel, director, *The Rights of Nature: A Global Movement*, at DOKfest Munich, 7 May 2018.

57 Quoted in Tom Regan, *The Case for Animal Rights* (Berkeley: University of California Press, 1983).

58 Cf. Anna Leah Tabios Hillebrecht and María Valeria Berros, eds., "Can Nature Have Rights? Legal and Political Insights," *RCC Perspectives: Transformations in Environment and Society* 2017, no. 6, https://doi.org/10.5282/rcc/8164.

economics is problematic, and certainly offers an insufficient measure for sustainable development into the future. There is hope that ideas from the global periphery may help us shift over time from the "objective" valuing and measuring of ever-faster consumption to a more subjective evaluation of what makes a good life: one which includes work-life balance, emotional health, and cultural and ecological vitality.[59]

We realize today, unlike a century ago, that it is important for humans and other creatures on this planet to keep the natural world "intact" even in areas that humans have never entered. Close to Guam and in immediate proximity to the deepest part of the Earth's oceans—the Mariana Trench, an area that has never been entered by humans—a US National Monument was created in 2009 by presidential proclamation. The monument protects over 95,000 square miles (246,000 square kilometers) of submerged lands and waters in the Mariana Archipelago. When it was designated a Marine National Monument in 2009, it became the largest protected oceanic area. Today, with many new ocean conservation initiatives and the success of the activist movement #OceanOptimism—which has reached more than 80 million people worldwide—the Mariana Trench Marine National Monument is now only the 14th-largest marine conservation area. In other words: 13 larger conservation areas have been established in only seven years. Similarly, researchers have recently found that octopus populations that were thought to have disappeared entirely were quick to recover in regions and in countries that responded to overfishing by setting up reserves so that octopus and squid populations could reproduce at their leisure. Restraint and rotational fishing (combined with overfishing of predators) have shown themselves to stimulate the quick recovery of octopus populations. The lifespan of octopuses is short, and they are able to edit their own RNA. Other ocean creatures have become extinct as a result of overfishing and many populations will not adapt as fast as octopuses. But the case of octopus populations shows that slow hope can come through the slowing down of human action, not least because the creation of marine reserves or rotational or "pulsed" fishing regimes can do more than preserve the status quo. After all, human and more-than-human ecologies have the capacity to mutually complement and invigorate each other and contribute to an intensified restoration of endangered environments. Awareness and action can trigger change while ecologies of more-than-human creatures

59 Annie Kelly, "Gross National Happiness in Bhutan: The Big Idea from a Tiny State That Could Change the World," *The Guardian*, 1 December 2012, https://www.theguardian.com/world/2012/dec/01/bhutan-wealth-happiness-counts.

can do their part as well. Together, human and nonhuman ecologies can restore and invigorate each other.[60]

Today's scholarship allows us to understand the intricate connections between human action and more-than-human ecologies. Awareness of ecologies (and for that matter awareness of ecological traps) is a recent phenomenon. Eugène Huzar—the Frenchman who understood the destructive environmental impact of technological developments and burning fossil fuels as early as the mid-nineteenth century—was ignored by his debate about the Anthropocene, have led us to rediscover and listen to some long-forgotten voices like that of Huzar.[61] Before World War II "the environment" did not exist. It emerged as late the 1940s as an interdisciplinary and integrated concept in science, and it took until the 1970s before the word "environment" was widely adopted in the English and Romance languages, and as "Umwelt" ("surrounding world") in German. The emergence of the idea of environment led to the rise of environmental studies and environmental science as new integrated academic disciplines. The very first bachelor of science degree program in environmental studies was established in the 1950s at the State University of New York College of Forestry at Syracuse in the US, and since the 1970s—with the rise of "environmentalism"—environmental studies programs have sprung up at hundreds of universities around the globe and even more so in school curricula.[62] There is slow hope, I argue, in the very fact that scholars from many different disciplines have adopted the term "environment" over the last 70 years and are exploring the intricate connections within and between complex ecologies, the effect

60 Elin Kelsey, "The Rise of Ocean Optimism," *Hakai Magazine*, 8 June 2016, https://www.hakaimagazine.com/features/rise-ocean-optimism/; "Global Facts about MPAs and Marine Reserves," *Protect Planet Ocean*, http://www.protectplanetocean.org/collections/introduction/introbox/globalmpas/introduction-item.html. In 2017, the Smithsonian Institution started hosting an annual Earth Optimism Summit, https://earthoptimism.si.edu/. Cf. Martin Guard, *Biology and Fisheries Status of Octopus in the Western Indian Ocean and the Suitability for Marine Stewardship Council Certification*, UNEP, June 2009, available online at https://unep.ch/etb/areas/fisheries%20country%20projects/south%20africa/MSC%20octopus%20reportTanzania.pdf. Cf. also Zoë A. Doubleday, Thomas A. A. Prowse, Alexander Arkhipkin, Graham J. Pierce, Jayson Semmens, Michael Steer, Stephen C. Leporati, et al., "Global Proliferation of Cephalopods," *Current Biology* 26, no. 10 (23 May 2016): PR406–R407, https://doi.org/10.1016/j.cub.2016.04.002.

61 Eugène Huzar, *La fin du monde par la science*, ed. Jean-Baptiste Fressoz (Alfortville: Ere, 2008); Eugène Huzar, "The Tree of Science," in *The Future of Nature: Documents of Global Change*, ed. Libby Robin (New Haven, CT: Yale University Press, 2013), 264–72; Clive Hamilton, Christophe Bonneuil, and François Gemenne, eds., *The Anthropocene and the Global Environmental Crisis: Rethinking Modernity in a New Epoch* (New York: Routledge, 2015).

62 "About Environmental Studies at ESF [College of Environmental Science and Forestry]: Departmental History," http://www.esf.edu/es/about.htm. Paul Warde, Libby Robin, and Sverker Sörlin, "Stratigraphy for the Renaissance: Questions of Expertise for 'the Environment' and 'the Anthropocene,'" *The Anthropocene Review* 4, no. 3 (2017): 1–13, https://doi.org/10.1177%2F2053019617738803. For a broader perspective cf. Libby Robin, Sverker Sörlin, Paul Warde, eds., *The Future of Nature: Documents of Global Change* (New Haven, CT: Yale University Press, 2013).

Octopus populations have been quick to recover in areas where marine reserves have been set up.

of turbulence on ecosystems, as well as the impact that human environment-making (through techno-industrial, economic, and other manipulative developments) has had on the biosphere.

There is slow hope also in the fact that we understand the underlying ecologies of nature and have started to imitate them. Michael Braungart, a German chemist and former Greenpeace activist (his book *Cradle to Cradle: Remaking the Way We Make Things*, co-authored with William McDonough, has sold millions of copies in China alone) argued for an industrial revolution that will not damage the natural world. He suggested that waste is nothing but the result of bad design. We should, he argues, understand the world as an ongoing biological or technical cycle and design products that are not wasteful but can be used in a C2C (Cradle-to-Cradle, as opposed to Cradle-to-Grave) way. The corporations Braungart and his partners have collaborated with have designed edible Lufthansa seats and grocery bags, running shoes that can release nutrients into the earth, and fully compostable books.[63] Not everything is recyclable and Braungart's dreams have their critics in both industry and politics. But there is hope in the C2C experiments and designs because

63 Michael Braungart and William J. McDonough, *Cradle to Cradle: Remaking the Way We Make Things* (New York: North Point Press, 2002).

they take the health and vitality of humans and their environments into account and replace an older understanding that supports limitless resource use.

The rise of the idea of the environment and a scholarly understanding of ecological processes has had an impact on the development of new technologies but also on politics. Thinking with the environment has brought about environmentalism, environmental institutions, environmental politics, and recently, and perhaps most importantly, the call for environmental justice. One might argue that a far-reaching institutionalization of the environment has blurred the dreams of environmentalists and diluted their concentrated goals. But without the emergence of the environment as a scientifically fruitful and politically relevant concept we would not have come to ask questions about vulnerability and risk, world-ecologies, and the relationship between nature and power. Moreover it is unlikely that the global search for an adequate response to climate change would have taken center stage in the arena of international diplomacy.

It would be easy to criticize the agreement that was reached on 12 December 2015 at the United Nations Climate Change Conference, the COP 21 in Paris. Social and environmental activists, scientists, and indigenous groups have called the agreement insufficient, weak, or compromised. And to a large extent they are right: climate change has already destroyed tens of thousands of livelihoods, and the situation will worsen in the near future for millions of mostly poorer people who will join the ranks of those who have already been displaced by climate change and extreme weather events. But the Paris conference nevertheless marked a historic step towards the recognition of the need for action on climate change, towards the cutting of carbon emissions, and towards world cooperation. No fewer than 195 nations came to the table in Paris and set limits on emissions. Historically, nothing like that had happened before. Before the twentieth century, a handful of scientists had been interested in the theoretical relationship between greenhouse gases and climate change, but only the empirical evidence accumulated since the late twentieth century established a clear connection between the burning of fossil fuels and a vastly accelerated rise in global temperatures.

None of the previous 20 climate negotiations had brought about a similar document. The Rio conference in 1992 did not bind governments to take action. The Kyoto protocol of 1997 never met its objectives, and it failed to negotiate emission targets for developing countries like China and Mexico. The Copenhagen agreement was not fully

adopted by the UN in 2009. The Paris summit turned out to be different because it based its message on overwhelming evidence from climate science and because it set an ambitious goal to limit global warming to 1.5 degrees Celsius (above preindustrial levels). It turned out to be different also because indigenous voices and voices from the Global South were listened to more attentively, and because moral and ethical concerns were brought to the discussion. It would have been unthinkable for any of the predecessors to Pope Francis to publish an encyclical on ecology like *Laudato si'*, to warn about "unprecedented destruction of ecosystems" and "serious consequences for all of us" if humanity failed to take action on climate change. And yet, the Vatican's call for "ecological conversion," published in May 2015, was timed, as Pope Francis acknowledged himself, to encourage a positive outcome at COP21.[64] It would have been unthinkable just a few years before the summit for the Rockefeller family charity—a fund started by oil magnate John D. Rockefeller—to call ExxonMobil, the world's largest oil company, "morally reprehensible" and withdraw all its investments in fossil fuel companies. This happened in 2016 as a direct consequence of COP21.

If we fail to analyze and contextualize historical developments, I argue, we miss not only signs of alarm but also signals of slow hope. Today, the early 1980s story of a big German wind turbine called "GROWIAN" (GROße WIndANlage) is almost entirely forgotten. From the beginning GROWIAN with its hundred-meter blades was criticized by journalists and industry engineers, because it needed constant repairs and modifications. Within a few months the project was labelled a failure; after four years GROWIAN was discontinued, and many called for a focus on conventional energy resources rather than putting money into wind energy projects. Those running the project did not realize the full potential of the machine. It required patience—and slow hope—before the potential of alternatives to fossil fuels was eventually recognized. In 2015 wind turbines generated over 13 percent of Germany's energy.[65] And renewables are on the rise in countries around the globe. There is evidence, according to anthropologist Sarah Strauss, that the rise of millions of small solar devices in rural

64 "Encyclical Letter Laudato si' of the Holy Father Francis on Care for Our Common Home," 24 May 2015, http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html. Ted C. Eckmann, "Revisiting Laudato si' in the Context of the COP21 Paris Climate Agreement," *Environment: Science and Policy for Sustainable Development* 58, no. 5 (2016): 38–42, https://doi.org/10.1080/00139157.2016.1209006.

65 Preben Maegaard, Anna Krenz, and Wolfgang Palz, eds., *Wind Power for the World: The Rise of Modern Wind Energy* (Singapore: Pan Stanford Publishing, 2013), 413; Paul Gipe, *Wind Energy Comes of Age* (New York: Wiley, 1995), 108.

India—many of them are today used for cooking and to charge cell-phones—have mitigated some of the devastating impact that Elsberg's novel *Blackout* warned of and that India had seen in earlier collapses of the power network. And perhaps even more strikingly: in 2015, Costa Rica met all its energy needs from renewable energies for 75 days in a row. Today we have reason to believe that Costa Rica will reach its declared goal of being 100 percent climate neutral as early as 2021 or soon thereafter.[66] A full deceleration of worldwide greenhouse gas emissions seems possible, and worldwide climate neutrality as well, if a whole nation like Costa Rica will achieve it in the not-so-distant future.

One can argue that a country with little industry—Costa Rica relies on tourism, agriculture, and technology exports rather than heavy mining and industrial production—is an exception. But there is slow hope in more industrialized areas as well, even in the United States, a country that is currently led by a president whose mind is caught up in the lure of an ecologically destructive past.

Portland, Oregon, a city in the Northwest of the United States with 2.3 million inhabitants, provides us with a story of slow hope. Portland had a long history of using its rivers as dumping grounds for sewage and industrial waste. A Portland City Club study in 1927 called the local Willamette River "filthy and ugly."[67] During World War II the Kaiser Shipyards and other industries began to massively pollute the city's rivers with petroleum residues, toxic chemicals, and heavy metals. Fish in the river were found to be notoriously disfigured and deformed in the 1950s, and in the 1970s Portland experienced air quality violations on 180 days per year. Amazingly, Portland has turned this situation around. Over the last couple of decades it has become "the greenest city in the US," "the most livable city," one of the top ten places to retire, and the number one city for beer.[68] In 1974 Portland was the first city in the US to tear down an urban highway and transform it into a huge waterfront park. In the 1980s the blue heron became

66 "Rockefeller Family Fund Hits Exxon, Divests from Fossil Fuels," *Reuters,* 23 March 2016; "Costa Rica's Green Energy Feat Shows Hope for the Planet," *Huffington Post*, 22 December 2015.

67 William G. Robbins, "Pollution in Paradise," Oregon History Project (2002, updated and revised by Oregon Encyclopedia staff 2014), https://oregonhistoryproject.org/narratives/this-land-oregon/people-politics-and-environment-since-1945/pollution-in-paradise/#.V82a5fmLTIU.

68 "Infographic: Why Portland May Be America's Greenest City," *Business Insider*, 29 March 2013, http://www.businessinsider.com/portland-green-city-infographic-2013-3; "America's Most Livable Cities," *Forbes*, 1 April 2009, http://www.forbes.com/2009/04/01/cities-city-ten-lifestyle-real-estate-livable-cities.html; "The 16 Best Beer Cities in America," *Thrillist*, 1 May 2015, https://www.thrillist.com/drink/nation/best-beer-cities-in-america.

the official symbol of Portland. In the 1990s, Portland was the first US city to introduce a climate action plan and a bicycle master plan, in 2001 it became the first to have a green building policy, and in 2015 it opened the longest bridge in North America that excludes cars. Many factors played a role in this radical transformation, including grassroots initiatives, community restoration projects, the courage of politicians, and "ecotopian" visions of a future that is fundamentally different from the present. Critics will claim that Portland has become expensive over the past couple of decades and that the city has a long way to go in terms of social and environmental justice for its minorities. And these critics are right. But new Portlands are already springing up in various places—Detroit with its open spaces, cheap housing, and recent and strong tradition of urban farming being one of them. A steady stream of Portland residents (as well as residents of Seattle and San Francisco) keeps moving to the former Motor Cities of the Midwest, bringing ecotopian visions to these deindustrialized places and vitality to their ruins.

Moreover, more and more city residents—particularly in countries that have for decades embraced mass-produced food—are bringing farming and gardening to urban environments.

In fact, even in the United States, where farmers' markets have been stigmatized as backwards institutions, numbers of regional markets have vastly increased over the last few years and farmers' markets can now be found in about ten thousand different places in the US alone.

There are thousands, tens of thousands of stories in which visions have turned into realities and therefore provided empowering hope—not overnight, but slowly, sometimes invisibly and often against all odds.

What We Need

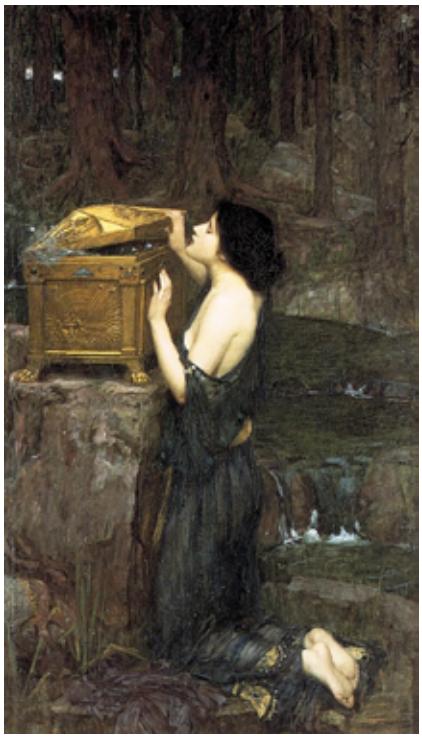
Major transformations in history—social and political revolutions for that matter—have not happened solely as a result of critical pressure. They happened because they were inspired by visions that women and men and collectives could relate to. In each instance, both push and pull have been at play: an awareness of precariousness as well as hopes and goals. In order to bring about change, in order to reduce the destructive human impact on the natural environment, we need more than science and technology, more than economics and prognoses. We need narratives and stories that can provide hope. Abstract findings—statistics and numbers—do not resonate with the general public. After all: what does it mean when the United Nations Environment Programme tells us that between 150 and 200 species are lost every day: a couple of hundred plants, birds, insects, and mammals every 24 hours? How would it change our lives if we lost 20 every day? Or 2,000? Doomy findings can shock us but they provide no glimmer of hope, no "Vorschein" (as Ernst Bloch puts it) of a better world, and—unless losses are directly or visibly haunting us like "Waldsterben" (Germany's forest death through acid rain) was in the 1980s—they are more likely to result in paralysis than in constructive action.

What we need, I argue, are stories and histories of change and transformation: stories of ecological alarm and stories of slow hope. We need stories that alert us to our collective vulnerabilities (like Elsberg's novel *Blackout*); stories that remind us that we are indeed living in what Donald Worster has called an "age of vulnerability,"[69] and what Rob Nixon has called a world of "slow violence." We need ecological stories that make us confront the fact that our power (however well-intentioned it might be) is potentially destructive and that the survival of humans on this planet depends on the preservation of soil and water and the habitats and ecological systems that we are an intrinsic part of. But we also need stories that provide us with alternatives to narrowly defined pathways: with ideas that seemed unimaginable before they were voiced and with paths that seemed unwalkable before they were walked. We need stories that empower us to become thinkers, actors, and activists capable of imagining alternatives in a world dominated by technical and economic constraints. We need ideas that will find their way through the mesh of an ever-tighter net of path dependencies. And we need people who will dare to cut apart some of the meshwork.

69 Donald Worster, "The American West in the Age of Vulnerability," *Western Historical Quarterly* 45, no. 1 (2014): 5–16, https://doi.org/10.2307/westhistquar.45.1.0005.

Scientific evidence that we are living in an era of climate change, resource exhaustion, and potential ecological disaster is overwhelming. But the urgency of this message cannot be conveyed through scientific data alone. Statistics about extinction and the gloom of decline will not help us identify ways and activities that can get us out of our often self-created ecological traps. We need stories that help us understand how humans have been able to invoke and work towards positive visions of the future. We need stories that remind us that decisions about vulnerability are currently the domain of a select few—political and economic—agents, and stories which make us realize that vulnerabilities are often politically constructed. Most importantly, we need subversive stories—counter-stories of slow hope—that demonstrate that we have found paths in the past to escape ecological traps: stories not only about humans as parasites of the Earth but as commensal organisms that feed off the Earth's resources without damaging the overall balance.

It is about time that we open Pandora's box again. According to Hesiod, after Prometheus had stolen fire from heaven, Zeus took revenge and presented Pandora to Prometheus's brother Epimetheus. In the presence of Epimetheus, Pandora opened a jar that released curses and evils. Once Pandora had closed the container, however, the one thing that was left inside was *elpis* (ἐλπίς), the spirit of hope. After the release of ecological curses, it is high time to get back to what is left at the bottom of Pandora's jar—a stream of stories of slow hope. It is time that we show successes and accelerations in ecological awareness, action, and restoration; uplifting stories with storylines that resemble hockey-stick curves; stories that include past successes and future visions about the rise of urban gardening and of renaturalized riverscapes, of successful protests against polluted air and water, of the rise of regional markets and slow food and the planting of trees around the globe, of initiatives and enterprises that work towards ecological restoration, of the return of squid to the ocean and of bison along the Dutch coast, of small communities that create their own energy, of the rise of ecological thinking and of environmental programs, of successful fights for human well-being and the rights of nature. The reality of ecological curses seems far greater than the power of the hopes that are left at the bottom of Pandora's jar. But if we believe that nothing can be changed, then we are giving up all our opportunity to act. We must not forget that we have hardly started to release Pandora's hopes. Opponents of slow hope will be quick to explain that the tasks ahead are too big for individuals and groups to take on; that major actors are needed that work on a global scale.



Painting of Pandora from 1896 by John William Waterhouse. Via Wikimedia Commons.

But there is no evidence that "the system" or "corporations"—"inside players" in the terminology of environmental philosopher John M. Meyer—are likely to play a decisive role in limiting ecological destruction. Take car companies as an example of such "inside players." They have celebrated successes in reducing greenhouse gas emissions of their fleets but interestingly this has not lead to an overall reduction of greenhouse gases—in part because of "rebound effects" but also because of their business agendas of permanent growth. On the other hand, evidence points to the power of ordinary citizens and groups, of "inside critics." In contrast to inside players (who play along and go along) and "outside critics" (who take overly radical positions that only dedicated minorities can relate to), open-minded "inside critics" are the most likely actors in human endeavors to limit environmental harm.[70] Inside critics combine both vision and an acknowledgement of crisis; hope as well as critical thinking. Bulgarian-born writer Maria Popova got to the heart of the matter when she wrote in a recent blog "critical thinking without hope is cynicism" and "hope without critical thinking is naïveté."[71] Hope can work as a wakeup call, an antidote to lethargy. Slow hope, the way I define it, comes out of a context of critical thinking. It acknowledges setbacks: the dialectics of ecological crisis, environmental awareness, and necessary action. The concept of slow hope suggests that we cannot expect things to change overnight; it also suggests that we may need to slow down ourselves. "Slow" refers not least to the need for ecological and social deceleration. The action that we need to take will at times—as paradoxical as it may sound—necessitate *in*action. If the ever-faster exhaustion of

70 John M. Meyer, *Engaging the Everyday: Environmental Social Criticism and the Resonance Dilemma* (Cambridge, MA: MIT Press, 2015), 5–9.

71 Maria Popova, "Hope, Cynicism, and the Stories We Tell Ourselves," Brain Pickings, https://www.brainpickings.org/2015/02/09/hope-cynicism/.

natural resources (in ecological terms) and the "shrinking of the present" (in social terms) are urgent problems of humans in the Anthropocene, then cutting down on exhaustive practices and working towards a "stretching of the present" may be ways to move forward. There is hope in the insight that time is both malleable and infinite. Winding down and creating breaks in everyday life can help restore both human and more-than-human natures. Stress-related burnout in modern societies and the burnout of the Earth's resources are closely related and identifying ways to transcend the craze of consumption, production, travel, and extreme workloads in a merry-go-round world can be inspiring and subversive.

If what we need is a deep understanding of our relationship with the environment, alongside critical thinking and hopeful visions, then the newly established field of the Environmental Humanities will have an important role to play. Environmental humanities initiatives are based on the premise that today's ecological challenges—because they are unprecedented in scale and quality—cannot be met by the sciences or the humanities alone, and that a dialogue across borders and disciplines, and between academics and practitioners, is needed in working towards a future in which human harm towards the environment is limited. Environmental humanities scholars bring reflexivity and alertness to academic and public debates and they use field seminars as well as creative forms of inquiry to broaden insights into relationships between humans and nature relationships and into world-ecologies. The very fact that the number of environmental humanities initiatives and networks, observatories and labs, societies and centers has skyrocketed in more than two dozen countries over the past decade alone is in itself reason for slow hope.

Movements for intellectual, social, and ecological change will come neither quickly nor easily but our hopes may in fact be accelerated by an awareness of our vulnerability and of the dangers of ecological traps. Understanding vulnerability and desires for hope can reinforce each other. This is precisely how we should read Friedrich Hölderlin, the German poet, who prophesied over two hundred years ago: "But where the danger lies, also grows the saving power."[72]

72 Friedrich Hölderlin, "Wo aber Gefahr ist, wächst das Rettende auch," in *Patmos. Dem Landgrafen von Homburg überreichte Handschrift* (Tübingen: Mohr, 1949).

Today's saving powers will not come from a deus ex machina, from a Hercules-like figure who killed the eagle that tortured Prometheus, and it will not come from heroes like the smart protagonist in Elsberg's novel *Blackout* who eliminates the hacker-terrorists. In an ever more complex and synthetic world our saving powers will not come from a single source, and certainly not from a too-big-to-fail approach or from those who have been drawn into the maelstrom of our age of speed. Saving powers will come from Pandora's forgotten box of hope: from diverse cultures and initiatives, from thinkers and mavericks and communities around the world; and yes, from the environmental humanities. They will come from those who understand the power inherent in the way we tell stories, from people who think and act ecologically, from women and men who are inspired by slow hope.

About the Author

Christof Mauch is the Director of the Rachel Carson Center and Chair in American Cultural History at LMU Munich. He is also an honorary professor at Renmin University of China in Beijing.

RCC Perspectives

perspectives@carsoncenter.lmu.de

Rachel Carson Center for Environment and Society
LMU Munich
Leopoldstrasse 11a
80802 Munich
GERMANY

www.rachelcarsoncenter.org

Design by Stefan Zinsbacher
Cover image: "Campfire on the shore of a lake," by Visit Lakeland, [CC BY-ND 2.0], via Flickr.

Printed on recycled ENVIROTOP paper by PAPER UNION GmbH.

ClimatePartner°
printed climate-neutrally

ISSN (print) 2190-5088
ISSN (online) 2190-8087
DOI: doi.org/10.5282/rcc/8556

In this essay, Christof Mauch sets out his concept of "slow hope." Departing from Rob Nixon's concept of "slow violence"—which describes the gradual, almost invisible nature of much environmental damage—Mauch highlights the mostly untold stories of quiet but positive environmental change that are often hiding in plain sight. The search for environmental hope does not downplay the magnitude of the problems we are facing, nor is it synonymous with unadulterated optimism. Yet, as Mauch shows, it is possible to look to hopeful narratives as alternatives to stories of decline—narratives which can help us to think creatively and act courageously in these times of converging ecological, social, and economic crises.

Rachel Carson Center
Perspectives
ISSN 2190-5088