



Witnessing mass extinction: What's invisible, what's visible, what's possible

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ABSTRACT

We are living in the time of the Sixth Mass Extinction. While many details elude us, we know that a mass extinction is underway from comparisons between background and current extinction rates, precipitous drops in wildlife populations, the shrinking of wild places, and the critical endangerment of biodiverse ecologies such as grasslands, tropical forests, wetlands, rivers and lakes, coral reefs, and continental shelves. This paper dissects the underpinnings of the Sixth Mass Extinction, with the intention of joining many other activists and thinkers to disrupt its seeming inevitability. First, I discuss what has been invisible about anthropogenic mass extinction—the event itself—and the factors of silence, ignorance, and denial underlying its invisibility. Then I turn to the visible dimension of the Sixth Mass Extinction, namely, the action orientation of “entitled instrumentalism” that is driving it; I describe entitled instrumentalism as the wholesale assimilation of the natural world into a human-owned domain. I end with considering the possibility of humanity charting an altogether different course. We must recognize mass extinction as the inevitable upshot of nature colonization and awaken to the need to restore and preserve Earth’s cosmic wealth.

1. What's invisible

The 2019 IBPES Global Assessment was the first international appraisal of the state of the biosphere since the Millennial Ecosystem Assessment fifteen years prior. It was undertaken by 150 experts from around the globe, who analyzed over 15,000 publications on trends in connection to biodiversity and ecosystem services. The report found that “the great majority of indicators of ecosystems and biodiversity show rapid decline” and that “a substantial portion of assessed species are threatened with extinction and overall trends are deteriorating.” Regarding indigenous lands, comprising roughly a quarter of the global land area, it concluded that while nature there is “declining less rapidly” it is “nonetheless declining” (IPBES, 2019).

Some of the Report’s data warrant highlighting. Seventy-five percent of land surface has been altered by human activity. Sixty-six percent of the global ocean has sustained cumulative degradation impacts. Compared to prehistory, the global biomass of wild mammals has fallen by 82 %. In the last 200 years, 85 % of wetlands disappeared. In the last 150 years, live coral cover has fallen by half. Since 1980, marine plastic pollution has increased tenfold and greenhouse gas emissions have

doubled. Between 1990 and 2015 logging reduced native forest cover by 290 million hectares (for comparison, the US state of Texas is about 70 million hectares). All mining has recently “increased dramatically.” In the last 20 years (prior to the COVID-19 epidemic) travel increased threefold, and 8 % of total greenhouse gases stem from tourism-related transportation and food consumption.

The expansion of agriculture, urban areas (which have doubled since 1992), infrastructure, and commercial fishing have come at enormous cost to grasslands, rivers, lakes, forests, wetlands, and ocean. The diversity of domesticated plants and animals is also plummeting, so that both cultivated and wild biological communities are becoming increasingly similar across the globe. Looking ahead, food, animal feed, timber, and bioenergy production are expected to “increase substantially” (IPBES, 2019). These developments will fragment natural habitats even further, accelerating the biodiversity crisis by making it difficult or impossible for species to move in response to changing climatic conditions (Root and Schneider, 2006; Noss, 2012).

The ranges of wild species are becoming constricted and converted into the technosphere.¹ Scientists coined the term “defaunation” to convey the decline of wild animal populations across a wide spectrum

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¹ The technosphere (or anthroposphere) is “the global emergent system that includes humans, technological artifacts, and associated social and technological networks” (Williams et al., 2015: 1).

(Dirzo et al., 2014). Climate change has been an exacerbating factor of the primary causes of biodiversity decline (agriculture and killing), but it will increasingly become a direct and unstoppable driver (Maxwell et al., 2016). Even at a warming of 1.5 to 2 degrees Celsius above pre-industrial levels (we now hover around 1 degree over), “the majority of terrestrial species ranges are projected to shrink dramatically”; with a 2-degree warming, coral reefs will “decline to less than 1 percent of former cover” (IPBES, 2019). A large portion of the worst damages to life has transpired in the last 50 years, when human population doubled, the global economy quadrupled, and trade increased tenfold (ibid.). The factors of population, overproduction, and trade continue to swell, as we are still in the throes of the Anthropocene-era cataclysm known as “the Great Acceleration” (Steffen et al., 2015; DellaSala et al., 2017).

The onslaught of multiple challenges simultaneously afflicting species and ecosystems is culminating in a mass extinction event called the Sixth Mass Extinction. As the name indicates, mass extinctions are rare—the exception to life’s burgeoning proclivity. With a mass extinction event, over 75 % of Earth’s species are obliterated. Diversification and geographic expansion begin anew from the life that survives and over the course of a few million years a novel chapter of biodiversity rebuilds itself. To put that timeline in perspective, our species emerged from our most recent ancestor roughly 200,000 years ago. A completed mass extinction event effectively means that all future human generations will inhabit a biologically profoundly impoverished planet.

The lifeforms driven to extinction today are robust: they are dying off because they cannot withstand the rate of change and the concatenation of forces working against their survival. Annihilating healthy species and bequeathing a biodiversity-impooverished Earth to the future, the Sixth Mass Extinction presents humanity with a profound ethical crisis.

Given how rare, how big, how irreversible, and how ethically unprecedented the demolition of Earth’s biodiversity is, one might expect that an imminent mass extinction would be all the rage in social media and regularly making headlines. Consider only one projection: Earth is an additional 1-degree Celsius warming away from losing 99 % of the live coral cover that existed in preindustrial times. On a catastrophe scale of 1 to 10, this is a 10 from any angle one chooses to think about it. Yet instead of public consternation and alarming headlines, we see the opposite: the Sixth Extinction has so far been mostly invisible in the mainstream.

This incongruent-with-reality invisibility reveals much about the forces colluding to conceal the destruction of our living cohort. Direct sources of extinction’s invisibility, which I turn to next, are official silence, public ignorance, and expert denial of its significance. To be sure, silence, ignorance, and denial surrounding extinction do not arise out of thin air. Rather, they express and serve the visible world order driving the extinction crisis—*human empire*, which I discuss below.

To interrogate silence we might begin with the formation of the IPBES in 2012 and its 2019 first report. This intergovernmental platform was modeled on the Intergovernmental Panel on Climate Change (IPCC). The IPCC was founded in 1988, almost twenty-five years before the IPBES, and has already generated five comprehensive reports about climate-change trends. Granted, these reports have not succeeded in altering the trajectory of climate breakdown, but they have played an important role in both policy shifts and consciousness raising around climate change. Now, reliable knowledge about the biodiversity crisis predates reliable knowledge about climate change²; the primary drivers have so far been independent of climate change; and the real possibility of an anthropogenic mass extinction was discussed in print in 1979 (Myers, 1979). Despite these facts, an international body to investigate

² At the turn of the twentieth century, Swedish chemist Svante Arrhenius did predict climate change from the accumulation of industrial carbon dioxide in the atmosphere. But his timeline of effects was millennia into the future and (being Swedish) he had a largely rosy outlook on anthropogenic warming (Sample, 2005).

biodiversity’s status and trends lagged considerably behind one for climate change. This lag arguably warrants the charge of official silence.

Additionally, in the IPBES Executive Summary for Policymakers, while there is extensive reporting and discussion of extinction—and the warning that “without action, there will be further acceleration of the global rate of future extinctions”—there is no mention of the Sixth Mass Extinction. While we have no way of knowing where we are in the course of this event, its inevitability is certain if humanity stays on the path of the Great Acceleration. Gerardo Ceballos and colleagues, using conservative estimates to compare background with current extinction rates, state the matter plainly: “We can confidently conclude that modern extinction rates are exceptionally high, that they are increasing, and that they suggest a mass extinction underway—the sixth of its kind in Earth’s 4.5 billion years of history” (Ceballos et al., 2015a). While the IPBES Report’s motives for omitting reference to an imminent mass extinction are unclear, here we discern another notable example of official silence.

The political sphere, as a rule, has remained silent about the extinction crisis. To my knowledge, for example, no high-profile politician has ever publicly uttered the words “mass extinction,” let alone issued a call for its prevention. This pact of silence struck me while listening to Barack Obama’s acceptance speech in 2008, when he pledged that during his presidency Earth’s seas would stop rising and ice formations stop melting. While listening to his promise to turn around the climate catastrophe, I pondered this question: Why would he *never say* that during his presidency the extinction crisis would be redressed? Our sensed incongruity of such a vow should not stop us from posing the question. By attending to the public discomfiture that a political promise to face the Sixth Mass Extinction would engender, we catch a glimpse of the powerful forces shoring up the silence. The directive of silence lets us discern how disturbing to entrenched social and ideological structures breaking the silence actually is.

Official silence from the political sphere, intergovernmental organizations, and mainstream media exacerbates public ignorance about the state of the ecosphere, which is extensive. Many people do not even know that a mass extinction is underway, despite over three decades of scientific publications. The majority of human beings, furthermore, are oblivious to the difference between background extinction (where a handful of species go extinct *every year*) and mass extinction (where at least a handful of species go extinct *every day*). The current spasm of enormous population losses of wild animals and plants, which eventually lead to extinctions, is another topic about which people are mostly in the dark (Dirzo and Raven, 2003; Ehrlich and Pringle, 2008; Ceballos et al., 2015b). Most human beings, moreover, do not directly experience animal and plant declines.³

Public ignorance is a condition fed by several causal streams. For one, it is due to a dearth of formal education about natural and environmental history, ecological processes, and evolutionary science. At least until recently, most schooling stayed focused on the topic of exalted importance: human affairs, without acknowledgment of the natural world that makes all human achievement and wealth possible. Ignorance is ramped up in the contemporary world by the proliferation of oft-conflicting “news” and “information” found on the World Wide Web, which undermines a robust sense of truth. The internet resembles an ocean with an indefinite number of islands, where users live out hours every day and can readily reinforce cherished beliefs. This virtual-world sponsored ignorance flows from virtual reality’s fracturing of collective consciousness and diversion away from our shared Earth realities toward individual or group insularities on the vast archipelago of the

³ Those with firsthand experience of nature’s degradation, from abundances of wild beings to empty habitats, are often overcome by shock and grief. Free divers, for instance, who have been visiting the seas over the past 20 or 30 years, have been heartbroken at the devastation of marine life that has occurred in a matter of years (Danson, 2011: 162–163).

internet.

Importantly, “the declining ecological baseline” underlies and reinforces public ignorance surrounding the extinction crisis. Unless otherwise tutored—and people generally have not been tutored given the anthropocentric learning spaces they’ve been steeped in—human beings regard the landscapes they inhabit and encounter as normal, regardless of how degraded or recently bereft of native beings they might be (Waldman, 2010; Jackson et al., 2011). People cannot read destruction into nature unless the destruction is starkly evident, they have witnessed it firsthand, or they have some ecological, evolutionary, and environmental education. A shocking way that the declining ecological baseline hit home for me as a university professor was that most students in my classes did not know that European settlers drove the most abundant bird species on the planet, the Passenger Pigeon, to extinction. That apparently “small fact” does not seem to have merited dwelling upon in American history classes. The dominant culture encourages forgetting, which “is another kind of extinction” (Todd McGrain quoted in Hudon, 2017: 7).

A last contribution to the invisibility of the extinction crisis that I consider here is expert denial of its significance. By “expert,” I refer to people with relevant credentials who therefore receive a stage to opine and are lent an ear. Just as climate change has had a minority of scientific detractors fueling skepticism, so the biodiversity crisis has had its own small cast of life-science naysayers. The naysayers do not necessarily deny that a Sixth Mass Extinction is underway. Rather, they avoid grappling with the ethical and ontological dimensions of this event by marshaling a slew of half-truths that sow doubt about extinction’s significance: It may be a big event, is their implicit message, but it’s not a big deal. Following are statements that recur in such skeptical minority reports. I add parenthetical qualifications to clarify why I call them “half-truths.”

- Nature is not fragile. (Generically speaking nature is not fragile, but life is fragile when impacted by multiple drivers and/or catastrophic onslaught.)
- Nature is always changing. (Nature is always changing, but as a rule change is slow and in the direction of creating more life.)
- Biodiversity will rebound. (Most probably, after a few million years.)
- Evolution is still happening. (Evolution is always happening, but species losses during a mass extinction episode way outnumber the emergence of new ones.)
- Introduced species increase biodiversity and humans are creating novel ecosystems. (Species introduced to new environments may increase diversity locally and create new ecological assemblages, but globally species diversity is rapidly falling and biodisparity—the ecological uniqueness of places—is giving way to increasing homogeneity.)
- Mass extinction is unlikely to lead to civilization’s collapse and extinctions do not necessarily unravel ecosystems. (“The sky does not fall” when species are driven to extinction, and civilization might well survive the Sixth Mass Extinction. Such claims, however, not only skirt the ethical challenge of human-driven extinction, they make the tacit pitch that such a challenge is nonexistent.)

As an example of this line of argumentation, I cite a passage from a widely read essay titled “Conservation in the Anthropocene.” Its half-truths, its assiduous avoidance of ethical questioning about obliterating species, and its insouciant tone disclose why expert denial of extinction’s significance is disturbing, and dangerous in promoting public nonchalance:

The trouble for conservation is that the data simply do not support the idea of a fragile nature at risk of collapse. Ecologists now know that the disappearance of one species does not necessarily lead to the extinction of any others, much less all others in the same ecosystem. In many circumstances, the demise of formerly abundant species can

be inconsequential to ecosystem function. The American chestnut, once a dominant tree in eastern North America, has been extinguished by a foreign disease, yet the forest ecosystem is surprisingly unaffected. The passenger pigeon, once so abundant that its flocks darkened the sky, went extinct, along with countless other species from the Steller’s sea cow to the dodo, with no catastrophic or even measurable effects.

(Kareiva et al., 2011: 33)

The main dispatch of this passage is that since data negate that all-out catastrophe follows extinction, extinction is not concerning.⁴ Its crude message is that any foreboding, call to action, ethical outrage, or mourning for the annihilation of lifeforms is unwarranted, since after extinction... life goes on.

Beyond fostering indifference and apathy toward anthropogenic extinction through specific examples (as above), a similar logic can be extended to a mass extinction event. Here is how another extinction-crisis detractor, scientist Chris Thomas, makes the leap:

People say we are in the throes of the sixth great extinction—as big as when an asteroid killed off the dinosaurs 65 million years ago. The jury is still out on that. It might take human numbers in the billions for a thousand years to do that much damage. But all past extinctions were followed by a burst of evolution. Disappearing dinosaurs created space for mammals to evolve. So why not this time? The flip side of a new great extinction would eventually be a new evolutionary explosion. A new genesis, if you like.

(Thomas quoted in Pearce, 2014)

There are also some who claim that “the jury is still out” on climate change. The jury is not out either on climate change or mass extinction. What’s more, billions of people would not require “a thousand years” to cause a mass extinction: if we continue with current trends, the remainder of this century will offer ample time. Be these inaccuracies as they may, Thomas glibly reminds his readers that in some future geological era “a burst of evolution” and “a new genesis” will follow the human-driven demolition of biodiversity. Such irrelevant forecasts beyond the Sixth Mass Extinction amount to a treacherous invitation, in environmental philosopher Deborah Bird Rose’s words, to “get by with loving less” and “to harden our hearts to devastation” (2013: 144) (Rose, 2013).

Expert denial is not limited to a small circle of life-science skeptics. Harvard psychologist Steven Pinker is a case in point. Pinker celebrates the modern era as a time when human beings never had it better in terms of material comfort, technological convenience, life opportunities, literacy, healthcare, and rule of law (2019) (Pinker, 2019). (Economist Julian Simon made similar cornucopian arguments about modernity in the late 20th century [1998] (Simon, 1998)). The fact, however, that modern progress has massively escalated the collapse of biodiversity is no small impediment to acceding to a sweeping praise of Progress. Thus, like Simon before him, Pinker had to misrepresent (and mostly avoid discussion of) the extinction crisis, getting well-deserved reviewer pushback as a result (Monbiot, 2018).

Official silence, public ignorance, and expert denial have colluded to make the Sixth Mass Extinction largely invisible and thus unavailable to societal contemplation and effective response. These factors have not appeared out of the blue—they are derivative of the material-ideological order of human empire that is the engine of the Sixth Mass Extinction. This visible order underwrites the invisibility of biodiversity’s unraveling: shining light on life’s collapse, upon which human dominance is founded, would threaten the legitimacy of that dominance. Keeping

⁴ Extinction naysayers like Kareiva and others would never make the same claim about indigenous people who have been wiped out—usually by the same forces that wipe out indigenous nonhuman species—even though catastrophe and collapse have not followed from those peoples’ obliteration either.

mass extinction concealed, therefore, has been (as a rule) the unspoken strategy of the dominant or civilized human, who has self-constructed the identity of a distinguished and entitled lifeform.

2. What's visible

There is virtually no aspect of dominant society today that does not accord with the supremacist belief-system that humans are a distinguished and entitled lifeform. For the purposes of this analysis, I want to highlight its following fundamental shared assumptions: humanity owns planet Earth; humanity is invested with absolute power of life and death over nonhumans; and humanity has the prerogative to use, manage, or assimilate into the technosphere virtually all geographical space. Even as these assumptions are unavailable to critical reflection by a large majority of humans, they underlie the human regime of Earth colonization.

Entangled with this regime is a largely Western-driven, turned global action orientation we might call “entitled instrumentalism.” The instrumental attitude of this orientation goes far beyond utilizing the world for human purposes. After all, organisms make use of the world as their natures guide. By contrast, instrumentalism frames the natural world as a wholesale domain for human use. This orchestrates relentless force on nature from the small-scale to planetary: for example, from the conventional herbicide applications of the next-door neighbor, to current international-corporate mining designs on the deep seabed (dubbed “the commonwealth of humanity”).

The wholesale instrumentalism that treats the world as human domain, with little measure or restraint, has been informed by human supremacy. “Instrumentalism in this form,” environmental philosopher Val Plumwood states, “is a clear expression of anthropocentrism and of an arrogant attitude to the other which treats it in the guise of a servant” (Plumwood, 2002: 113). Briefly stated, anthropocentrism or human supremacy is the widespread conceit that humans obviously “are” superior to all other Earthlings.⁵ I scare-quote the word “are” to signify that a human sense of distinction has been inculcated so deeply and for so long that it constitutes a shared view that appears existentially unshakeable. Phenomenologists call this kind of collective perspective or experience the *taken-for-granted*: its foremost quality is its unavailability to critical thinking, since the “taken-for-granted” is assumed to be *ground* (Schutz, 1967).⁶

The facets of the instrumental attitude (pragmatic) and supremacy (ideational) have fused into a force that is larger than the sum of its parts—the action orientation of entitled instrumentalism. Its two dimensions are intermeshed: The instrumental manipulation of the world often displays human lack of restraint and grandiosity, while such vanity reads its own ontological validity in the successes of instrumental action. On a more prosaic register, the fusion of pragmatic and ideational facets of entitled instrumentalism is actuated through linguistic, managerial, technological, and institutional means. These tightly interwoven means have placed the living world under colonial siege—a siege that is patently visible, but, from a mainstream perspective, completely unremarkable. I turn to a brief discussion of the linguistic, managerial, technological, and institutional expressions of entitled instrumentalism.

Through the language that people share, entitled instrumentalism pervades the human collective. Its master concept is “resources,” along with its derivatives, with reality-hijacking meanings that portend the living world’s physical repurposing. The plunder of the seas, for example, is prefigured in the concepts of *fisheries* and *fish stock*. The same

goes for *livestock*, which meshes fittingly with the treatment of animals in the industrial food system. Similarly, the devastation of freshwater biodiversity—with losses tallied to 84 % of its vertebrate populations (IPBES, 2019)—is beholden to the conceptual conflation and instrumental reduction of rivers and lakes to *freshwater*. The declines of seashore habitats, wetlands, and their erstwhile biodiversity dovetails into the usurpation the word *beaches* permits. Calling wildlife *game* completely erases animals’ sentient nature from view, while adding an Orwellian spin to killing. The pejorative term *marginal lands* tacitly decrees them up for grabs for livestock grazing or biofuel production. Commonplace concepts like fisheries, livestock, freshwater, beaches, game, and marginal lands encapsulate and advance the modality of colonization. Representation and action work together to assemble a perception of legitimate reality, analogously to sociologist Max Weber’s idea of “elective affinity” which he coined to capture the resonances and mutual reinforcing between different social spheres (2013) (Weber, 1905/2013.).

Along with renaming in resource-derivative vocabulary, “abjecting” targeted portions of the nonhuman world is another trope of entitled instrumentalism that works in elective affinity with real-world incursions: labeling and appropriating, and labeling and exterminating, work together. The meaning of renaming is elucidated through the examples above. Abjection (with respect to human worlds) has been expounded by critical theorist Judith Butler as a conception of “the other” as so unworthy and odious as to invisibilize them or place them beneath contempt (Butler, 2013); abjected humans can be subjected to shunning, torture, rape, or genocide. Abjection is widespread toward nonhumans. An abjected plant (“weed,” “pest”) can be burnt with the casual spurt of an herbicide. An abjected animal (“vermin,” “invasive”) can be poisoned, hung, fumigated, mass killed, or mass processed on assembly lines. Abjection is likely the vilest modality that hierarchical thought has ever devised, but it is completely normalized and routinely directed toward many nonhumans.

While resources is the master concept of entitled instrumentalism, and abjection one of its modalities, management is its chief modus operandi. Webster’s defines “to manage” as “to direct or control the affairs or interests of; to control the direction or operation of; to cause to do one’s bidding; to bring about or contrive; to handle or wield.” Connotations of power thread through these definitions: not power in the guise of domination, but as something rationalized and administered. Management is rational control over a living or nonliving entity to achieve certain goals.⁷ For example: for an agricultural plot to yield a certain amount of bushels; for a natural area to offer recreational or ecosystem services; for a wild animal population to conform within set boundaries; or for a threatened or endangered species to be kept in existence (in situ or ex situ) in minimal numbers. Control is management’s *raison d’être*, though any implication of power struggle for control has been shed. Management comes *after* what is to be managed has been colonized—confined, monitored, made measurable. Management comes after the boundaries of a national park, grazing lands, or agro-industrial field have been delineated. Management, say of a salmon population, comes after a river has been dammed. Management, for example of the American bison, comes after the species has been nearly extirpated, had boundaries arbitrated, and culling levels set. Management is a modern phenomenon not only because it is mediated by scientific modeling and technologies, but also because its prerequisite is the achieved domination of what is to be managed.⁸

⁵ I have elaborated arguments about the worldview of human supremacy elsewhere, and will not repeat them here (Crist, 2018, 2019). See also Jensen (2016).

⁶ Sociologist Alfred Schutz writes, “The taken-for-granted... is always that particular level of experience which presents itself as not in need of further analysis” (1967: 74).

⁷ Management is defined as “the process of determining the use, development and care of land resources in a manner that fulfills material and non-material cultural needs, including livelihood activities such as hunting, fishing, gathering, resource harvesting, pastoralism and small scale agriculture and pastoralism” (IPBES, 2019).

⁸ For critiques of managerialism see, for example, Birch (1990), Turner (2006), and Chrulew (2011).

Closely knit with the linguistic and managerial facets of entitled instrumentalism, modern technologies work as its primary physical apparatus. Philosopher Hans Jonas noted a momentous shift with respect to technology in the modern era: technological development became a *project*—a “restless phenomenon,” as he put it, of nonstop innovation and progress (2010). What, we might ask, enabled this modern swerve of technology into restless activity?

With the emergence of a mechanistic view of nature propagated by modernity’s founding thinkers,⁹ the technological juggernaut became unmoored from ethics—from considerations of care for the integrity and wellness of the nonhuman world (Merchant, 1980; Mason, 2005). Stripping away ethical concerns that might hinder technological design, technological dynamics came under the unilateral sway of criteria of instrumental effectiveness. With the quashing of ethical query or disquiet that could slow down advancements, all that remained was the proverbial foot on the accelerator leaving behind pre-modern, slower technological tempos. The ideational dimension of excising ethical deliberation from the technological imagination has become a (if not *the*) defining quality of the technological realm, with dire repercussions for the nonhuman world and ultimately for humanity as well.

With instrumental criteria of efficiency and economy at the helm, technological development became released—as an amoral means-ends apparatus—to follow its internal logic of progression constrained solely by physical and mathematical laws. For example, the earliest chainsaw that could fell a tree in, say, 5 h became a machine capable of felling a small forest in the same amount of time (Valliant, 2005). The trawl started out as a small net suspended between a couple of beams pulled by a sailboat, and became a monstrosity large enough to park several big airplanes, pulled by diesel-powered industrial-processing ships (Danson, 2011). In 2019, *The Guardian* reported on a recent study showing that American agriculture has become 48 times more toxic to insect life than 25 years ago (Klein and Lappé, 2019). The colossal power of fossil-energy hungry Mountain Top Removal machinery, deep-sea drilling, and hydro-fracking (Klare, 2012) obeys the pattern set by hollowing technology of ethics and delivering it to instrumentalism’s solo agenda. In 2015, the American Chemical Society announced its 100-millionth chemical registration, amounting to the tempo of a new chemical substance registered every 2.5 min in the last 50 years (DellaSala et al., 2017). What has let loose the sinister powers of technology to amplify by orders of magnitude, and then some, is the surge of technology’s unfolding ever and only toward a pure instrumentalism.

The unmooring of the technological from critical thinking into a restless acceleration has originated in the subjugation and instrumentalization of nonhuman nature and ultimately of planet Earth itself. Only disaster can come from the exemption of so much power from considerations of care. We see this disaster for the natural world, to give one stark example, in the destruction of marine life abundance and habitats, which, if we wanted to pin it on *one* thing, we can concede marine scientists’ pinning it on fishing technologies’ gigantism and high-tech turn (Roberts, 2007; Danson, 2011).

Disaster ricocheting on humanity inexorably trails the careless unleashing of modern technologies on the world, as Jonas discerned decades ago. The first disaster is the sacrifice of authentic human freedom, given “the despotic dynamics of the technological movement as such, sweeping its captive movers along in its breathless momentum” (2010: 22). This deep loss of human freedom paradoxically supervenes from “surrender[ing] our being to a freedom without norms” (ibid. 21). The other disaster is the “rampage of technology” imperiling both the quality and preservation of human life (ibid.). Indeed, whether insurmountable, tragic calamities come from nuclear weapons, Artificial Intelligence, global toxification, climate breakdown, the ocean’s death, geoeengineering, or some other technological curveball—the core cause will be technology’s spurn of an ethical stance toward the natural world

having unleashed it into mindless acceleration. Chalk it up to one more stream of evidence—this one possibly fatal—that humanity cannot exempt the natural world from care without exempting itself from the same.

The main institutional dimension of entitled instrumentalism is *property*, which has acquired global dominion and legitimacy. “In today’s world,” writes environmental lawyer and author David Boyd, “land is either private property or state-owned property” (Boyd, 2017: xxvi). (Later he adds: “No matter where wildlife lives, it belongs to humans.”) Earth is allocated along individual, national, and international ownership coordinates. Indeed, while “the commons” and “the commonwealth” are typically defined contrastively to property, on closer inspection they signify common-access *human* property. The institution of property is thus clandestinely ensconced within its purported antonyms.

Ironically, nothing betrays Earth colonialism quite as brazenly as the supposedly equitable concepts of “the commons” and “the commonwealth.” Not only are the commons and commonwealth covert versions of human property, but the imaginary of property is projected onto the planet as such, with humanity as Earth-owner. Earth is viscerally experienced by civilized people as *Homo sapiens*’ eminent domain, so that planet ownership is taken-for-granted by the multitude. Even the celebrated photograph of Earth from space, that has elicited so much admiration, thinly veils pride in the technological achievement that offered the planet-estate view.

We might balance that view with the vast earthly experience, and panorama of the universe, of primeval Earth. We are given a glimpse in an early twentieth-century travelogue of Lama Anagarika Govinda into Tibet (1966) (Govinda, 1966). His journeys brought him to the border of Ladakh (in Kashmir) and Tibet at a time when, in his words, this “was one of the few spots in the world where man and nature had been left to themselves without interference of man-made ‘authorities’ and governments” (1966: 60).

Here the inner law of man and the physical law of nature were the only authorities, and I felt thrilled at the thought of being for once entirely on my own, alone in the immensity of nature, facing the earth and the universe as they were before the creation of man, accompanied only by my two faithful Ladakhis and their horses... In spite of the feeling of smallness in the vastness and grandeur of the mountain landscape, in spite of the knowledge of human limitations and dependence on the whims of wind and weather, water and grazing-grounds, food and fuel and other material circumstances, I had never felt a sense of greater freedom and independence. I realized more than ever how narrow and circumscribed our so-called civilized life is, how much we pay for the security of a sheltered life by way of freedom and real independence of thought and action. (ibid.)

These words point to a human experience that has become rare and increasingly unavailable. The loss itself has been forgotten—another casualty of the receding baseline. A sea change has occurred from the immensity of nature and the smallness of the human, to (for now) the dominance of the human and the finiteness of geographical space.

Govinda moves from describing his journey experience in untamed geography to the breathtaking view of outer space:

At night the curtain is drawn back and allows a view into the depth of the universe. The stars are seen as bright and near as if they were part of the landscape. One can see them come right down to the horizon and suddenly vanish with a flicker, as if a man with a lantern had disappeared round the next corner. The universe here is no more a mere concept or a pale abstraction but a matter of direct experience; and nobody thinks of time other than in terms of sun, moon, and stars. The celestial bodies govern the rhythm of life, and thus even time loses its negative aspect and becomes the almost tangible

⁹ Particularly Francis Bacon and René Descartes.

experience of the ever-present, ever-recurring, self-renewing *movement* that is the essence of all existence.

(ibid. 61, emphasis original)

The universe here is no more a mere concept or a pale abstraction but a matter of direct experience. Beyond early twentieth-century Ladakh, “here” was/is Earth with its boundless vista of the Milky Way. Thus alongside an impending mass extinction event, the planet’s colonization has begotten the extinction of cosmic experience. Civilized life has all but eclipsed that transcendent view, along with its revealed knowledge of our infinitesimal smallness in the universe, even as humanity presumes ownership of what it has temporarily constructed as a “finite planet.” We even have a picture from outer space that proves Earth’s finiteness.

We also have maps that show it. Maps are artifacts that aid and abet entitled instrumentalism, and there is no end to their proliferation. They are mundane objects and techniques of extraordinary performative force: they constantly assert and remind that the world is under human ownership and jurisdiction. The ubiquity of mapping installs Earth’s geographical conquest directly into human consciousness bypassing critical awareness. Earth’s places are inscribed through geopolitical maps, atlases, road-signs, signposts, ship lanes, “Belt and Road” type initiatives, GIS apps, GPS voice-overs, and Google grids. The human mind, saturated by such human-tenure etchings, cannot see the reality under construction as a totalitarianism with neither precedent nor end in sight.

Civilized humanity has achieved ownership of geographical space through the conquest of wilderness, the untamed biogeography that has its own will, its own boundlessness, its own destiny, and its own imagination. Free nature has been shriveled into fragmented plots and souvenirs of the bygone past (Birch, 1990; Turner, 1996). As an integral part of the erasure of wild Earth—in its original essence of indomitable, expansive, and life-filled spatial being—civilized humans especially exercise control through the obliteration, constriction, and management of the world’s mobile nonhumans: the animals who move in packs, herds, flocks, pods, and schools.

In the age of entitled instrumentalism, nonhumans who thrive on landscape-scale movement are targeted for contraction and control. We can keep the animals qua *specimens* (maybe), even bring them back from the brink, but their freedom to move is forbidden. This goes for the present and gone animals of the Americas, Europe, Asia, and Australia—the salmon, bison, auruchs, wolves, tigers, chiru, elephants, rhinos, wild yaks, saiga, thylacines, dingoes, kangaroos, and so many others. The animals of Africa are presently experiencing the same fate: their predicament—with Africa’s exploding human population and rising middle class—is rapidly worsening (Bodasing, 2021). For example, in the last two decades lions have disappeared massively even from recent strongholds.¹⁰ Lions are only faring well in fenced reserves in Kenya and southern Africa, which are “very effective” in keeping them around (Bauer et al., 2015). These reserves “include many small populations that require metapopulation management, euthanasia, and contraception” (ibid. 14897). In this very hour we are witnessing the end of the wild and free lion—the archetypal king of animals.

Modern humans have tended to heed the “McCall of civilization,”¹¹ conforming to its usurpation of the face of the Earth and its proliferating technological venues, while overlooking the consequence of the termination of nonhuman lifeforms and their homes. The restructuring of the world by/into the technosphere is aggravated by the enthralling distraction of one of the technosphere’s offshoots—“the society of the spectacle” (Debord, 1995). “The spectacle,” critical theorist Guy Debord

wrote, “is the bad dream of modern society in chains, expressing nothing more than its wish for sleep. The spectacle is the guardian of that sleep” (1995: 18). The greater the colonizing expansion of technosphere and its sundry “fireworks,” the more rapidly does the curtain of mass extinction descend. As artifacts and spectacles multiply, and the richness of the living world fades, dominant humanity is lured into spectacular dreams about its destiny as, for example, cyborgian “Human 2.0” and “multi-planetary species” (Sahota, 2018; Musk, 2017).

3. What’s possible

“How can man’s freedom prevail against the determinism he has created for himself?” Jonas asked (2010: 22) (Jonas, 2010). Echoing Jonas’ question: how might human beings step out of the historical inertia of entitled instrumentalism and make a different choice as planetary inhabitants?

While humanity has largely undone the Holocene, refusing the Anthropocene arguably still lies within the scope of human freedom. To exit the Anthropocene requires people to perceive it as the destination of Earth colonization that it is (Johns, 2019). The surfacing of this perception into critical awareness may support an alternative vision to emerge in the collective imagination. Critical theorist Julian Reid rightly praises the power of the imagination to glimpse what “exists beyond, bound to and bound for a world beyond” (2012: 161) (Reid, 2012). “A politics of resistance,” he adds, “enables us to dream and imagine in ways that are proper to the human psyche” (ibid.).

Let us imagine an alternative reality: An ecological civilization of inclusive justice and multispecies flourishing that is committed to protecting Earth’s *cosmic wealth*—the abundance of diverse life that creates the living planet we inhabit in the cosmos. Today, the anthroposphere (or technosphere) has become dominant (Stokstad, 2020), while shrinking islands of free nature are sounding the requiem of mass extinction. Yet we can envision Earth’s reality in the inverse modality, with a downscaled humanity dwelling within the expanse of a biodiverse planet, the extinction crisis halted and the climate crisis abated: a vision of human belonging rather than owning and managing, of inhabitation designed humbly within the whole rather than overtaking and reconfiguring it. We can dream of relations equitable among ourselves and with all Earth’s beings.

We are perilously close to forgetting Earth’s cosmic wealth. Not so long ago, rivers and streams were described as having more fish than water (Roberts, 2007: chapter 4). When Ferdinand Columbus arrived in the Caribbean in the early 16th century, he reported that “the sea was thick with turtles so numerous it seemed the ships would run aground on them and were as if bathing in them” (quoted in Jackson and Alexander, 2011: 15). The seafarer who gave Cape Cod its name complained that his boat “was constantly ‘pestered’ by thick schools of codfish” as he navigated the peninsula (Kurlansky, 2011: 102). Who now knows about or remembers the “once great abundance of whales, walruses, sea cows, seals, dolphins, sea turtles, sharks, rays, and large fish” (Jackson, 2005: 29). Grasslands worldwide supported herbivores in the tens of millions, along with their predators and commensals, who all fertilized expansive plains. The diversity of grassland plants rivals that of rainforests—a recent study found 89 plant species in 1-square-meter patch of Argentine grassland (Mosher, 2012). Wetlands too are rich in life: by the seas they serve as life’s nurseries, while on land they are stopovers for migrating birds and mammals. Tropical forest, coral reef, and deep-sea biodiversity is legendary, wondrous, and still largely unknown. When fish and trees were left to grow old, they grew bigger and bigger nourishing life’s abundance in forests and seas. Now around the planet big trees are dying and fish are getting smaller and fewer (Welch, 2020; Roberts, 2012). While it may sound hopelessly romantic, to some, to remember Earth’s tremendous fecundity, we might instead reasonably wonder: Why would humanity *not* choose to inhabit such a world? What is blinding us to the gift of abundance we can dwell within?

It is human supremacy that is blindsiding humanity, perhaps fatally

¹⁰ In the last century, African lions have disappeared from 80 % of their historic range. See <http://africanlions.org/>.

¹¹ Anything but a civilization critic, the source of this cutting expression is Harry Harlow (1958).

at this crucial historical juncture. To live amidst the planet's cosmic wealth we must decenter the human—downscale humanity's presence and protect large portions of the natural world. But the stance of human distinction blocks even countenancing the idea of shrinking the human factor: that reigning stance has conflated human greatness with planetary dominion. Thus, humanity's true greatness and most noble qualities—humility, gratitude, wonder, awe, respect, restraint, and the ability to see ourselves as belonging with Earth—have been eroded as much as Earth's biodiversity and life-supporting capacity. As is the case with every form of colonialism, the colonialist inexorably falls victim to the fact that arrogance plucks out his eyes.

Life may be scarce or commonplace in the universe—no one knows—but whatever the case, Earth's living plenum exists nowhere else. Life is a *historical* phenomenon: every living being and constellation of beings in existence is unique, it has never appeared before nor will ever appear again in the universe. What life remains with us now is a onetime treasure and a great privilege and fortune to coexist with. Will humanity not comprehend the grandeur and singularity of what is evanescent before it is too late?

Declaration of competing interest

I declare no conflict of interest in our *Biological Conservation* Perspective submission.

This statement is to certify that:

The work is all original research carried out by the authors. All authors agree with the contents of the manuscript and its submission to the journal.

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All appropriate ethics and other approvals were obtained for the research. Where appropriate, authors should state that their research protocols have been approved by an authorized animal care or ethics committee, and include a reference to the code of practice adopted for the reported experimentation or methodology. The Editor will take account of animal welfare issues and reserves the right not to publish, especially if the research involves protocols that are inconsistent with commonly accepted norms of animal research.

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