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Perspective

"Nature's contributions to people" and peoples' moral obligations to nature

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ABSTRACT

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has become influential in biodiversity conservation. Its research is published widely and has been adopted by the United Nations and the Convention for Biological Diversity. This platform includes discussion about how values relate to biodiversity conservation. The IPBES emphasizes "relational values", connecting these with living a "good life," and "nature's contributions to people" (NCP); building upon ecosystem services (ES), which have dominated nature valuation for 15+ years. Although the IPBES acknowledges instrumental and intrinsic natural values, they purport that by adopting relational values, conservation will become more socially- and culturally- inclusive, moving beyond the "unhelpful dichotomy" between instrumental and intrinsic values. We wholeheartedly agree that conservation should become more inclusive – it should, in fact, morally include nonhuman nature. We argue that far from being half of an unhelpful dichotomy, intrinsic natural values are incontrovertible elements of any honest effort to sustain Earth's biodiversity. We find NCP to be mainly anthropocentric, and relational values to be largely instrumental. The "good life" they support is a good life for humans, and not for nonhuman beings or collectives. While passingly acknowledging intrinsic natural values, the current IPBES platform gives little attention to these, and to corresponding ecocentric worldviews. In this paper we demonstrate the important practical implications of operationalizing intrinsic values for conservation, such as ecological justice, i.e., "peoples' obligations *to* nature". We urge the IPBES platform, in their future values work, to become much more inclusive of intrinsic values and ecocentrism.

1. Introduction

> "*We are now in the first century in the 35 million centuries of life on Earth in which one species can jeopardize the planet's future.*"
>
> - Holmes Rolston III, (2020)

Humanity is now indisputably faced with the twin existential crises of climate change and the accelerating annihilation of Earth's biological and cultural diversity (Ceballos et al., 2015, 2017; Rozzi et al., 2018). Although anthropogenic extinctions have been occurring for millennia (Diamond, 2013a; Sandom et al., 2014), in recent generations these crises have been driven foremost by colonial, industrialized societies focused on economic growth (Spash and Hache, 2021), and their concomitant and voracious appetite for what are traditionally termed "natural resources" (Diamond, 2013b). It its' current form, globalized neoliberal capitalist culture, along with an ever-burgeoning human population (Crist et al., 2021), now unequivocally threaten humans and nonhumans alike with a "ghastly future" (Bradshaw et al., 2021). In this article we argue that a key element in solving such unprecedented threats is an unprecedented transformation of modern society's anthropocentric and colonial worldview through which nature exists to serve humankind (Vetlesen, 2015; Taylor et al., 2020). For conservation

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scientists, a first step in any such transition will be to decolonize conservation itself by broadening our focus from "ecosystem services" and "nature's contributions to people" to explicitly include ecocentric values and peoples' moral obligations to nature.

In recent years, concern about the climate and biodiversity crises has reached a new crescendo among scientists, policy-makers and the public. Thousands of scientists signed a new, "Second Warning for Humanity" (Ripple et al., 2017) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019) released an alarming comprehensive global assessment. Meanwhile, Greta Thunberg, a high-school student from Sweden, sailed across the Atlantic Ocean to address the United Nations and the United States Congress, while thousands of people worldwide protested against climate change (Fridays for Future) and biodiversity loss (Extinction Rebellion). Most recently, leaders from over 60 countries pledged to fight the joint climate/biodiversity crises, calling for "One Planet" cooperation, and protection of 30% of Earth's relatively intact ecosystems, roughly double the current, international target of 17% (OPS, 2021); moreover, Dinerstein et al. (2017) and Crist et al. (2021) provide ecological and social rationales protecting 50% or more of terrestrial ecosystems.

Why, despite so much endeavor to understand and avert environmental catastrophe, has humanity not yet been able to accomplish a step change toward true sustainability? A comprehensive review of research indicates that the answer lies partly in humankind's predominant worldviews that, in various ways, consider humans to be superior to nonhuman organisms, if not also separate from nature generally (excepting many Indigenous societies) (Taylor et al., 2016). As philosophers and sociologists of knowledge have argued, scientists who inhabit societies in which such assumptions are dominant tend to take those assumptions on board in their study designs and analyses (Kuhn, 1996; Berger and Luckmann, 1966). In this light, it is unsurprising that concern for nature is rationalized by instrumental or utilitarian (i.e., anthropocentric) values, mirroring predominant economic paradigms.

Particularly in recent years, nature conservation has come to be justified to protect "ecosystem services" or "nature's contributions to people" — most usually disproportionately to elites. For Rozzi (2013), such worldviews have produced "plutonomy" rather than democracy, namely, social systems in which most of the socioeconomic power is held by a small minority of the human community, who typically succeed in perpetuating this state of affairs. In 2016, for example, 71 of the top 100 revenue owners were corporations, not nations (Babic, 2018); such entities do not operate by democratic principles, nor are they bound by international agreements such as those pertaining to human rights or nature conservation. Herein we argue that a counterweight to such assumptions and anthropocentric values is needed: scientists, scholars, and citizens alike must become much more explicit about, and effective in, promoting ecocentrism, i.e., the inherent (intrinsic) value of nonhuman nature.

We write as scholars who have affinity with "deep ecology" and sharing "ecocentric values," namely, the perspective that nonhuman organisms and diverse ecosystems hold intrinsic value (Soulé, 1985) and ought be allowed to exist, evolve, and flourish. We furthermore see ourselves as being part of those social movements advancing ethical and legal developments that seek to enshrine rights to species and natural entities, while resisting the endless growth economy (Daly, 2014) and its fanciful belief that there are no limits to growth (Borowy and Schmelzer, 2017; Hickel and Kallis, 2020). We maintain that the ecological sciences provide a window through which humanity might recognize the peril of our current course and the values lost though the mass extinction of biodiversity. We recognize that ecology is just one such lens through which humans may come to recognize intrinsic natural value and ecocentric ethics, and we stand in solidarity with the myriad worldviews that attribute moral status to the more-than-human world.

2. Through the ecological lens: discovering global crises

2.1. Sustainable development and planetary boundaries

The current mass extinction and climate crises have come to the attention of policy makers and the public largely through the work of environmental scientists. It was the 1972 *Limits to Growth* report and the UN Conference on the Human Environment, which took place in Stockholm the same year, which began to galvanize environmental concern and popularize the idea of sustainable development at the global scale. Although the focus remained largely anthropocentric (i.e., sustaining human values, see, e.g., Taylor et al., 2020), these were the first efforts that recognized human impacts globally, and they were derived largely from the ecological sciences. More recently, the planetary boundaries concept (Rockström et al., 2009), although justly criticized for its limitations (Montoya et al., 2018), serves at least to illustrate the biophysical finiteness of Earth as seen through the ecological lens (Fig. 1). In the planetary boundaries figure, the bars for climate, biodiversity, and other Earth-system parameters, turn from green to yellow to red, as humanity broaches "boundaries," vividly illustrating that "sustainability" has always been *normative idea*, derived, nonetheless, from *objective* measures of Earth's biophysical environment.

Thus, the contemporary understanding of sustainability owes much of its origin and formulation to viewing the world through the ecological lens, the convergence with traditional ecological worldviews notwithstanding. It is important to bear this in mind when developing ways of operationalizing decolonization, because Indigenous worldviews may be incommensurable with common ecological science practices such as counting, measuring, and predicting population, species or ecosystem responses (Law and Joks, 2020). Because ecological science has typically been the foundation for species conservation and habitat protection

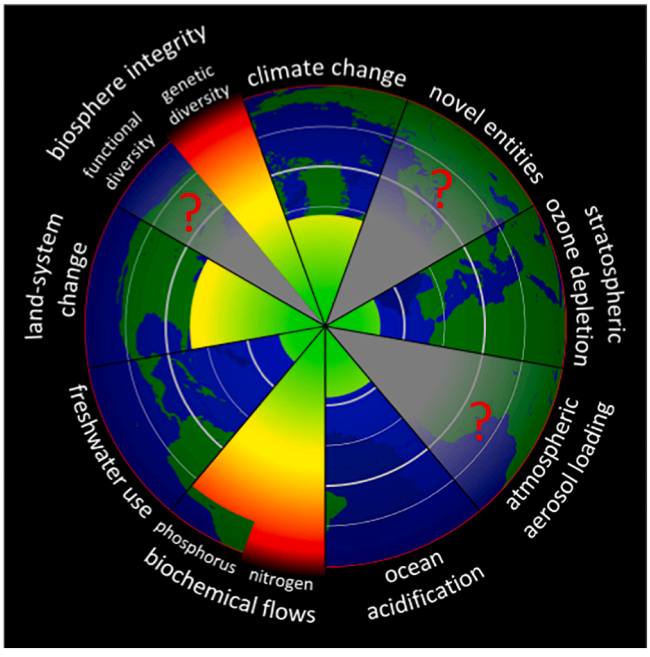

Fig. 1. The planetary boundaries concept, from Rockström et al., 2009. Note the bars turn from green (go) to red (stop) as ecosystem attributes are further degraded. This is scientific knowledge being used explicitly to warn that we may exceed the boundaries of "safe operating spaces for humanity", i.e., objective knowledge providing moral guidance. The concept is wholly anthropocentric in that the "safe operating spaces" for nonhuman nature are not considered other than as a means to human ends. Image: creative commons: https://commons.wikimedia.org/wiki/File:Planetary_Boundaries_2015.svg
(For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

practices, however, decolonizing conservation will require new and innovative means of accommodating the plural worldviews of multiple stakeholders (Tengö et al., 2014). Expressing ecological values (Vetlesen, 2015; Curry, 2017) may be one means of finding such common ground (see Intrinsic Values and Ecocentrism sections below).

2.2. Biodiversity, ecosystem services, and "nature's contribution to people"

The 2019 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment of Biodiversity and Ecosystem Services (Díaz et al., 2019; IPBES, 2019) was the largest-scale international assessment since the UN-commissioned Millennium Ecosystem Assessment (MEA, 2005). The IPBES report corroborates a host of recent scientific findings about the continued loss of biodiversity (Ceballos et al., 2015), coupled with associated "biological annihilation" (Ceballos et al., 2017). Not only have previously-reported high extinction rates (e.g. Wilson, 1985; Soulé, 1985) accelerated, but there has been a precipitous decline in all wild animal populations; the IPBES estimate of >70% loss corroborates previous reports. Like planetary boundaries and sustainability, biodiversity assessments are largely based on scientific concepts of populations, species, and ecosystems (e.g., Díaz et al., 2019). The IPBES platform, however, has made strides toward broadening the knowledge base for ecosystem assessments, to include Indigenous and local knowledge; toward this end they have popularized the term "nature's Contributions to People" (NCP) as an alternative to broaden the concept of ecosystem services.

The ecosystem services (ES) concept dates from the 1980s (Ehrlich and Mooney, 1983; Washington, 2020), although antecedents of human dependence on nature can be found throughout earlier ecological literature, among Western classical texts, and in diverse aboriginal worldviews (Taylor et al., 2020). Since the publication of the Millennium Ecosystem Assessment (MEA, 2005), the ES concept has become the foremost approach for assessing natural value, particularly in relation to economic valuation (Costanza et al., 2017). It is difficult to find an area of the ecological sciences, natural resource management, or public policy that has not been directly influenced by the ES approach. Despite the ES framework having received plenty of critique (e.g. Vira and Adams, 2009; Kopnina, 2017), it remains the by far the dominant means of assessing natural value (IPBES, 2019), particularly through "natural capital" approaches (e.g., Dasgupta, 2021) that are closely aligned with the neoliberal economic approaches that many believe are among the root causes of biodiversity loss (Spash and Hache, 2021). ES have remained strongly anthropocentric and utilitarian (Washington, 2020; Muradian and Gomez-Baggethun, 2021). Yet, the Convention for Biological Diversity's (CDB) post-2020 strategy maintains this focus on ES (CDB, 2021).

Most recently, the IPBES has advanced the concept of NCP as a means to emphasize that nature's value is "not just commodities", to highlight plural and diverse ways of knowing nature and to assess "all of nature's contributions…to the quality of life for people" (IPBES, 2021). The IPBES' focus on biocultural diversity, attempting to "decolonize conservation" by assessing Indigenous and local knowledge is laudable. It represents an effort to more broadly consider nature's bountiful gifts. By introducing the concept of NCP and highlighting the diverse ways in which humans relate to and benefit from nature, the IPBES hopes to improve ecosystem assessments, policy and governance. NCP uses a broader categorization than ES by including material and non-material (e.g. spiritual and cultural) contributions of the natural world (Díaz et al., 2018). This effort seeks to broaden the circle of human stakeholders included in policy-making process, thereby incorporating a diversity of worldviews not easily reconcilable with purely economic valuation of nature, as for example, with many Indigenous and local cultures (IPBES, 2019). Such broadening of the stakeholder base can be seen as a genuine effort to decolonize conservation by giving voice to previously underrepresented interest groups.

The NCP concept is paradoxical, however, because it strongly conveys the anthropocentric (utilitarian) notion that nature exists to serve humans (Muradian and Gomez-Baggethun, 2021). Thus, NCP may be at odds with the worldviews of stakeholders who share non-anthropocentric (ecocentric) values - ironically, often the very stakeholders the IPBES wishes to engage! Below we explain why the concept of NCP is counter-productive for decolonizing conservation because it reinforces, rather than refutes, the anthropocentric worldview in which nonhuman organisms and ecosystems are mere means to human ends. We briefly summarize the IPBES approach based on instrumental and relational values; we then follow with sections on intrinsic natural value and ecocentrism. We contend that recognizing and practicing ecocentric (i.e., nonanthropocentic) ethics is a moral obligation (Curry, 2017; Piccolo, 2017; Washington et al., 2017). Moreover, such ecocentric ethics converge in myriad ways with diverse cultures and knowledge systems (Vetlesen, 2019); they thus provide a strong foundation for conserving both biological and cultural diversity (Washington et al., 2017; Taylor et al., 2020), thereby helping to decolonize both conservation and the biosphere itself (Lovelock, 1979; Johns, 2021).

3. Instrumental and relational values: still all about people

Environmental philosophers have long distinguished between instrumental (utilitarian) and intrinsic (non-utilitarian, inherent) values (see, e.g., Curry, 2017). The introduction of the concept of relational values has been a key element of the IPBES platform (Chan et al., 2016; Himes and Muraca, 2018), developed "as a departure from the economic valuation framework that commonly dominates assessments of ecosystem services". Relational values are defined as: 'preferences, principles, and virtues associated with relationships, both interpersonal and as articulated by policies and social norms'; they can be defined as "anthropocentric yet non-instrumental" values. The relational values concept attempts to capture values that are difficult or impossible to quantify monetarily. Yet, as currently framed by the IPBES platform, relational values are still essentially instrumental (albeit non-monetary) values. The relationship between a person (or peoples) and a natural entity (an animal or plant, a species, another human) is deemed as being *of use* (instrumental or utility) to the *people* in living a good life – "nature's contributions to people". There is thus no explicit reference to the good lives of nonhumans – where there are no humans there is no value.

Thus, it is questionable if relational values should be considered a 'third' ethical values concept next to instrumental and intrinsic value (Piccolo, 2017), rather than just an approach that involves more in-depth and qualitative methods for ES assessments (Stålhammar and Thorén, 2019). In fact, 'relational values' are not new; they have long been part of environmental thought, in the sense of involving people's meaning-saturated relations with nonhuman nature (Thoreau, 1854; Leopold, 1949; Rolston, 1981, 1982; Berry, 1988). Such values can also be seen as being rooted in a sense of wonder toward nature (Carson, 1965; Washington, 2019) and in ecoreciprocity (Kimmerer, 2013a; Washington, 2021). While these sensibilities are often framed in terms kinship ethics and tethered to spiritual perceptions and practices, they do not only characterize many indigenous cultures, as has been increasingly expressed (LaDuke, 1999; Kimmerer, 2013b; Whyte, 2021), but also threads of western culture such as in the arts and sciences (Taylor, 2021; Van Horn et al., 2021).

Consider a practical example, conservation of woodpeckers. Most woodpecker species require large old trees and dead snags; they are uniquely adapted to their niche of drilling in wood, a niche few, if any, other animals have ever evolved to fill (Diamond, 2013a). If a peoples' good life requires either open landscapes or the maximization of cubic meters of lumber from forests, there will be few mature trees to provide for the woodpeckers' unique niche. The peoples' relationships with the landscape will, in fact, lead to the extinction of the woodpeckers and there will be no moral reason to protect their habitat – the woodpeckers' good lives are not explicitly accounted for in a relational values

worldview. In point of fact, intensive forestry practices and forest clearing worldwide have indeed led to the demise or extinction of unique woodpecker species as old-growth forests are increasingly converted to production forests or cleared for agriculture (Virkkala, 2006; Vergara-Tabares et al., 2018). Sweden, for example, where some of authors of this article reside, has done a notoriously poor job of woodpecker conservation (SLU, 2022), despite being considered a nation with high regard for forest landscapes and having a very high level of human well-being and ecosystem stewardship – the peoples' relationships with the forest landscape has focused more on wood production from even-aged conifer stands rather than on having a high diversity of tree species and mixed-age forests.

3.1. *"Unleashing" the wrong values?*

To their credit, the authors of the 2019 IPBES Global Assessment sought to "unleash values" incorporating diverse perspectives into the ES paradigm, in particular strengthening the dimension of social justice. But the assessment lacks meaningful reference to *ecological values* (Faith, 2018), or *ecological justice* and the increasing attention to the rights of nature or duties to nature (Hillebrecht and Berros, 2017; Chapron et al., 2019; Kopnina and Washington, 2020). Indeed, although the report briefly refers to "Mother Earth" it never actually addresses whether nature should have rights. The modern concepts of conservation biology and protected areas, however, are based in part upon the existence of intrinsic natural value (Meine et al., 2006; Callicott, 2017a; Washington et al., 2018). It is likely that the strongly anthropocentric and utilitarian foundation of ES valuation thinking, which the IPBES platform has evolved from, along with the requirement to produce policy-relevant and evidence-based assessments (Stålhammar, 2021), are responsible for the failure to account for intrinsic value and ecological justice. Since the task of IPBES has been closely associated with ES assessments and nature-valuation thinking, it is to some extent understandable that the broadened focus has been on human subjective preferences of nature as a basis for understanding value, rather than on nature's rights. The IPBES explicitly states, however, that their task is to summarize the best available scientific knowledge. Their failure to consider the relevant literature on intrinsic value (see below) and ecological justice (Washington et al., 2018; Treves et al., 2019), thus appears to be either a gross oversight or a disingenuous attempt to downplay the ecocentric foundations of conservation biology (Piccolo et al., 2018). Indeed, Muradian and Gomez-Baggethun (2021) find that the IPBES approach:

> "…*claim[s] to be nurturing a paradigm shift while perpetuating, under a new jargon, the most problematic tenets of the ES framework and utilitarian environmentalism in general*".

Perhaps, then, the concept of NCP is unleashing the wrong values, those anthropocentric values that many believe are, in fact, responsible for our environmental crises? As Curry (2017) writes:

> "*At the moment…such anthropocentrism rules, even inside the environmental movement. The results, jeopardizing both humanity and nonhuman nature, are all too evident…pretending to care because it might save us (instrumental value), and basing a programme on that pretense, won't change a thing. Why not? Because being anthropocentric and instrumentalist, it remains wholly within the mode which – especially in its most intensely organized and institutionalized form, industrial capitalism – is causing the problems that the move is supposed to relieve.*"

4. Intrinsic natural value: "what good is it anyway?"

The IPBES platform, while opening many new doors for inclusive conservation, fails to include the inherent standing of nonhuman nature and to advance intrinsic natural value, which constitutes the very foundation of our moral responsibility to the biosphere and all of its inhabitants. The failure to openly and irrevocably recognize intrinsic (inherent) value appears to us as a fatal flaw in any platform that aspires to the deep sociocultural shifts required to achieve sustainability. The critical importance of intrinsic value is perhaps most evident as viewed in the opening clause of Preamble of the Universal Declaration for Human Rights (UN, 2021):

> "*Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world…*"

To illustrate the real-world implications of intrinsic value, philosopher J. Baird Callicott (2017b) retells the story of Edwin (Phil) Pister, a fish biologist for over 50 years at California Fish and Game, and founder of The Desert Fishes Council (DFC, 2022). Pister led efforts to protect the desert fishes of western North America beginning in the late 1950s (he was a student of Starker Leopold, Aldo's son). His efforts culminated with a successful legal case before US Supreme Court, protecting the desert pupfish under the Endangered Species Act; later he saved another pupfish species by transferring the entire population in a bucket when its desert spring habitat was being dewatered (Pister, 1993). Pister received a great deal of criticism from fellow California Fish and Game employees during the so-called "hook and bullet" era of game management (Callicott, 2017b):

> *"The concern and care lavished by Pister on these tiny non- game species of fish baffled his colleagues… Of each such species rising to the attention of a judge, instead of a fly, they would ask him, what good is it, anyway? For years Pister struggled to answer that question. For example, some of these fish thrived in salt- saturated brine; so maybe research on their remarkable kidneys could provide information applicable in medicine. But would such speculative option value – to put the issue in economistic terms – outweigh the value of drinking water for thirsty LA and agricultural, commercial, and residential development in western Nevada? Hardly. His quest for an effective answer to the what-good-is-it-anyway question led Pister to Environmental Ethics (the journal). And there, in the concept of intrinsic value, he found the answer that had eluded him. That answer – species of desert fish have intrinsic value – certainly satisfied Phil Pister, who now had a term and a body of academic literature to justify his own intuitive application of the concept to endangered species…*
>
> *Pister finally found a rejoinder that has provided us environmental philosophers with as much insight and rhetorical leverage as we ever provided him. He answered the question, what good is it, anyway? with a question of his own: what good are you?"*

So just what is natural intrinsic value? As noted above, human rights are based on the intrinsic value (inherent good) that each of us carries – to harm a human violates that good by inflicting suffering or restricting one's potential, and thus is morally wrong. So states the Mosaic Decalogue, and most legal systems, and upon such values are inter-human ethics built. But as philosopher Holmes Rolston III (2020) notes, post-enlightenment ethics in western cultures have long been considered as largely (or exclusively) *only* inter-human. Cartesian dualism has long held sway over western philosophy and ethics (Oelschlaeger, 1991; Taylor, 2010; Curry, 2017), and until recently nonhuman nature has been considered void of intrinsic value. Rolston (2006, 2010) has delved deeply into the genesis of natural value, investigating the question of where values originate. He finds intrinsic value is "objectively there" in nature, as much as any such value is "objectively there" in humans, in the sense that natural value – lifeforms pursuing their own intrinsic good – has fueled life's persistence through over 3.5 billion years of Earth's history, independently of any *human* subjects. Life on Earth, finds Rolston, is a second "Big Bang", as exceptional as the first Big Bang (matter-energy). Such a view shifts the center of value from people (anthropocentric) to people *and* nature (ecocentrism). This directly recognizes moral worth in organisms, species, and ecosystems, and thus places duties upon people to prevent unnecessary harm to nature.

Oak trees, for example,"defend" their own kind of good – they

produce tannins to deter grazers, compartmentalize wounds in the trunk, and grow thick bark to resist fire. Whether or not oak trees "know" that they do these things, they certainly "know how" to do them. They have a good of their own, inherent in their being, an intrinsic value. Oak trees are instrumentally good for squirrels (acorns) and oxygen-breathing organisms (photosynthesis), but acorns and photosynthesis are derivative of oaks defending their own goodness (growing and reproducing). All organisms, for the past 3.5 billion years, have had some form of good of their own – individual nonhuman beings, like individual humans, have intrinsic value.

But no individual, human or nonhuman, can carry on the species line alone. There is no oak tree inside an acorn, there is only spirit (life), and genetic information waiting to *inform* the nascent seed how to grow in relation to its own world (soil, water, pollinators, dispersers). Acorns are formed after pollen from a male flower meets the ovary of a female flower. Plants, like animals, recombine genetic information, and over countless generations species thus track their environment – acorns that contain genetic instructions for thicker bark may survive better during periods with frequent fires, thereby perpetuating the species' good. Species have a good of their kind, a super-good that supersedes individuals, in fact. Analogously, Rolston (1985) diagnoses extinction as a form of *super-killing* that terminates not only individual lives, but the historical achievement of the species line through time and space. If it is wrong to needlessly kill individuals it is super-wrong to extirpate species:

> "*What is offensive in the impending extinctions is not the loss of rivets and resources, but the maelstrom of killing and insensitivity to forms of life and the forces producing them. What is required is not prudence but principled responsibility to the biospheric Earth*"
>
> (Rolston, 1985)

Over the past 40 years an extensive body of literature has been developed to elucidate the scientific and philosophical underpinnings of intrinsic natural value, and its importance for biodiversity conservation (see, e.g., Curry, 2017; Piccolo, 2017; Callicott 2017; Washington, 2019). This perspective extends from individual organisms to biotic communities and ecosystems, in other words, to eco-evolutionary collectives (Callicott, 2013, 2017). Today, many scholars and citizens unequivocally support the intrinsic value of nature and what some call biospheric values (Rolston, 2020; Vetlesen, 2015; Taylor et al., 2016; Curry, 2017; Washington et al., 2018; Washington, 2019; Kopnina and Washington, 2020) – such an extension of ecocentric value, in fact, converges with myriad indigenous worldviews or "cosmologies" (Vetlesen, 2019).

From its inception the Society for Conservation Biology recognized intrinsic value (Soulé, 1985) and it remains first among the core beliefs of SCB, although sometimes forgotten it seems (Piccolo et al., 2018). This eco-evolutionary conservation ethic has been deeply developed by a generation of collective thought on people-nature relationships. The clear consensus is that there can be no objective dividing line between human and nonhuman nature in terms of intrinsic value (Fig. 2).

In our view, the IPBES platform has paid scant attention to this body of research and to the importance of intrinsic values and ecocentric moral sentiments as a rationale and inspiration for biodiversity conservation through public support (Ghasemi and Kyle, 2021).

5. Sharing is caring: ecocentrism, ecological ethics and ecological justice

5.1. Homo sapiens, the wise ape? A part of, but apart from nature

In finding our place as a part of nature, in "decolonizing" nature, we may lose sight of the very evolutionary ecology that at once verifies both our oneness with the nonhuman world and the uniqueness of being human. Ecology tells us that species are, *in fact*, unique. We humans, like all species, have a unique set of traits. Our evolutionary history seems to have selected us uniquely as *thinkers and communicators* – at some time, just a hundred thousand years ago or so, we took a "great leap forward"

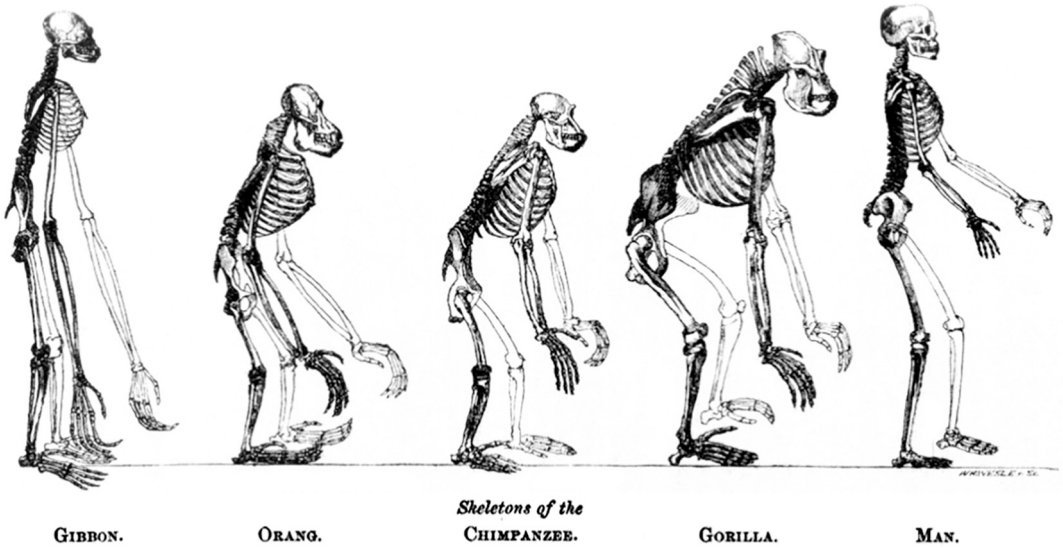

Fig. 2. The intentionally evocative (albeit somewhat fanciful) image of human evolution from T.H. Huxley's "*Man's Place in Nature*" published in 1863. Huxley was nicknamed "Darwin's bulldog" because of his fierce defense of the theory of evolution by natural selection. With Darwin, Victorian society and western science was forced to acknowledge that humans were a part of nature. In "Monument to a pigeon" Aldo Leopold (1949) wrote: "*it is a century now since Darwin gave us the first glimpse of the origin of species…*", noting we are "*only fellow voyagers in the odyssey of evolution.*" The scientific evidence is clear that there is no firm dividing line among taxa or through time beyond which somehow only humans became "intrinsically valuable." No longer can any reasonable philosophy or ethic be based upon human moral exceptionalism—the idea that only humans have intrinsic worth. All species are, by definition, unique. If our human uniqueness allows us the gift of broader consciousness to enable moral behavior, the most noble extension of our morality, as Darwin (1872) himself observed, is extending moral concern to the nonhuman world. (Image Benjamin Waterhouse Hawkins (1807–94), Public domain, via Wikimedia Commons).

(Diamond, 2013a), going through a "cognitive revolution" (Harari, 2015), or a "Big Bang" (Rolston, 2010). Mind, claims Rolston, is the *third* Big Bang, following those of (1) matter-energy and (2) the genesis of life itself. Largely through our powers of thought and language, we develop unique cumulative transmissible cultures wherein we can accumulate, synthesize, and communicate the *thoughts* of previous generations, first orally and later in writing.

Thus, humans have developed cultures with little precedent in the nonhuman world – we have nations and corporations, communism and capitalism, science and religion, philosophy and ethics. We still pick apples and collect seeds, but we also plow fields, build cities, burn oil, apply pesticides and assemble nuclear arsenals. Ecology might tell us where we come from, but only ethics can tell us how we ought to behave. Early humans first colonized the globe, leaving a wake of prehistoric megafauna extinctions, then Eurocentric cultures recolonized much of the globe (Diamond, 2013a). The fruits of our cognitive revolution at first allowed us global predominance – they now threaten us with anthropogenic mass extinction and ecocide (Ceballos et al., 2017). Indeed much of the world's biological and cultural diversity has already yielded before this onslaught, brought on by our technical prowess and moral ignorance.

Like all living beings, we humans evaluate (find values in) our world. Uniquely, humans create ethics grounded upon our valuations, and we assign rights based on ethics (Curry, 2017). Rights are not a physical part of our being, they are a product of our cumulative transmissible cultures (Harari, 2015). Western philosophy, sadly, has too often assumed that in *finding* value we thereby *create* value; nonhuman nature has traditionally been assumed to be objective and value-neutral, while human subjectivity bears the source of value which can overlay the natural world with meaning. Hence, Western ethics and rights have been hitherto largely inter-human. Our finding value through philosophy, however, no more implies that we 'create' the value than does our finding stars though a telescope or genes through a microscope imply that we create the stars or the genes. The stars, the genes, and the values are as objectively there as anything ever can be. We can feel the warmth of the nearest star without knowing physics and breed better crops without knowing genetics. If philosophers refuse to find values in nature, so much the worse for philosophers. Myriad cultures have long since recognized intrinsic natural value, and ecocentrics have reaffirmed these values in ecological terms.

In the end, arguments for protecting nature for anthropocentric reasons fail to account for intrinsic natural value, whether these are discovered through ecology or Indigenous worldviews. There is little evidence that people take to the streets to protect nature *only* for their own sake; indeed, there is evidence that the most ardent defenders of nature are motivated by deep, affective feelings of belonging to and dependence on nature, and corresponding, ecocentric values (Taylor, 2010; Taylor et al., 2016). Activists act in solidarity with oppressed peoples not for utilitarian reasons, because they expect something in return, but simply because it is right. Civil society is based on such moral behavior, sometimes enshrined in law, but often won at great personal cost for those who participate. In declaring universal human rights *Homo sapiens* has employed intellect to enshrine empathy, at least for our own kind. We ought not stop there, however. An eco-evolutionary worldview, alongside myriad Indigenous worldviews, recognizes peoples' moral obligations to nature in equal measure to nature's contributions to people. Darwin himself (1872) envisioned this when he wrote that extending ethical concern for nonhumans was the ultimate ennoblement of our moral sense.

Although it might be convincingly argued that we owe stronger moral obligation to members of our own species, it is, we assert, neither reasonable nor ethical to doubt that people have moral obligations to nature. Many indigenous societies have embraced kinship ethics (Nelson and Shilling, 2018; Kimmerer, 2013b; Knudtson and Suzuki, 1992; Taylor et al., 2020; Whyte, 2021) and in Australia, First Nations peoples have seen protection of life as a fundamental law (Graham and Maloney, 2019). Many other societies have understood this, developing norms that censure wanton waste or cruelty toward animals, for example. From biblical times to the present, the ill-treatment of nature has been regularly censured (e.g. RSPCA, ESA). Such cultural norms and legislation are strongly grounded in a *recognition* of the inherent value of nonhuman nature. We ask, what logical argument can be made that it is wrong to abuse an animal solely because of the animal's utilitarian value? By analogy, most human beings are of some utilitarian value to others: it is common throughout history for parents to bear children who would be of assistance to the family or community (Lancy 2008; Anthropology of Childhood, Cambridge; agricultural makes big families valuable). But surely, child labor laws are not based on the notion of protecting child welfare so they may be of future use to their parents? If nature's inherent value has long been recognized by some societies implicitly and others explicitly, including many Indigenous societies (Graham and Maloney, 2019), and more recently, by a host of environmental thinkers, why have direct obligations to nature received so little attention from the IPBES? Perhaps because they remain mired in the anthropocentric paradigms of ecosystem services and Nature's contributions to people. The time is ripe for real transformation!

5.2. The fourth big bang: decolonizing the human spirit

If, as Rolston suggested, the third Big Bang generated mind, then it has been a curse as well as a blessing. "I think therefore I am" has shaped civilizations, science, and medicine, helping us to reduce human hunger and disease. We have travelled widely on Earth and even beyond, sending back images of our home planet from space. Ironically, now that we achieved such global dominance we have finally recognized Earth's fragility. If our thinking has taught us anything, it is that we now hold the future of much of the life on Earth in our collective hands.

Rolston hinted, however, at a fourth Big Bang, that of presence (Presence). This might be akin to Black Elk's "Great Mystery" (Neihardt, 1972), "Harmony" (Aldo Leopold, 1949), "Enchantment" (Patrick Curry, 2019) "Reverence for Life" (Schweitzer, 1921) or "Wonder" (Carson, 1965; Washington, 2019). Our science seems to be telling us that empathy is one of the keys, that ethics is the key 'log' (Leopold) needed to break the log-jam of our Cartesian Dualist relationship with life on Earth. "*We care, therefore we are one*" ought now to replace "*I think therefore I am*". For all our biocultural diversity, for all our plural valuations of the world around us, we still need to recognize and stand with some *universal* goodness – the intrinsic values of life on Earth. These are the values inherent in evolution of life itself. Earth and life are indisputably here and real, and have been creating inherent goodness since long before humans arrived to measure it (Rolston, 2006, 2010).

5.3. Converging values

Black Elk's Lakota people called life "the Great Mystery" yet he clearly articulated how they found value in all life (Neihardt, 1972):

> "*It is the story of all life that is holy and is good to tell, and of us two-leggeds sharing in it with the four-leggeds and the wings of the air and all green things; for these are children of one mother and their father is one Spirit.*"

Darwin (1859) in positing the unbroken chain of descent among all living beings, famously found:

> "*There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.*"

Leopold wondered how, a century after Darwin, science and philosophy had yet to find a sense of kinship with life on Earth – we wonder still when scientists and philosophers will catch on. We strive for an *ideal*

of oneness with our *Universal* Declaration of Human Rights, paradoxically through recognizing and protecting *diverse* human individuals and cultures. Even when we fail to achieve this ideal we struggle on – intrinsic value and ensuing rights are *incontrovertible* foundations of humanity. So must we also strive for the ideal of oneness with all life on Earth – intrinsic natural value and nature's rights are also incontrovertible, the foundation of true sustainability and a desirable future. We ought by now to be able to *receive* Nature's contributions to people with humility rather than hubris, while *reciprocating* with respect and gratitude (Kimmerer, 2013a; Washington, 2021). Nature's contributions to people are only half the story, mired in anthropocentric assumptions that lack an adequate basis for sustaining Earth's wondrous biocultural diversity. Only through reciprocating, by recognizing ecocentric values and peoples' moral obligations to nature, can we join in the mutually-dependent web on the biosphere.

The storied achievement of over 35 million centuries of life on Earth is now in our hands. As scientists, scholars, and conservation practitioners dedicated to sustaining Earth's biodiversity, is "nature's contributions to people" really the best we can do?

Declaration of competing interest

I hereby declare that there are no conflicts of interest related to the the manuscript entitled ""Nature's contributions to people" and peoples' moral obligations to nature", by John J. Piccolo et al. The manuscript is submitted to the Special Issue of Biological Conservation entitled "Ending the colonization of Nature", guest edited by David Johns.

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