OTHER THEMES

Decoloniality, Biocentrism and Environmental Education

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ABSTRACT – Decoloniality, Biocentrism and Environmental Education. The political emergence of indigenous peoples in Brazil in the 1970s/1980s brought contributions to both the environmental and environmental education fields. The aims of this paper are to investigate contributions from this emergence to the environmental debate, mainly as related to the resumption of the concept of biocentrism; and to address some implications of that resumption for Environmental Education. Results corroborate the resumption of the concept but question the claims that it is naïve. Epistemological, theoretical, and political questions are raised. Results also identify the resumption of the ontological aspect of the debate and raise questions about its implications for environmental education research and practices.
Keywords: **Indigenous Peoples. Coloniality. Environmental Rationality. Syntropy.**

RESUMO – Decolonialidade, Biocentrismo e Educação Ambiental. A emergência política de povos originários no Brasil nos anos 1970/1980 trouxe contribuições para a questão ambiental e a educação ambiental. Este artigo possui dois objetivos: investigar contribuições oriundas dessa emergência para o debate ambiental, sobretudo com o resgate do conceito de biocentrismo; e discutir algumas das implicações do resgate desse conceito para a Educação Ambiental. Resultados corroboram a retomada do conceito de biocentrismo, porém questionam a alegação de que é intrinsecamente ingênuo. Questões de ordem epistemológica, teórica e política são levantadas. Também, identificam a retomada da dimensão ontológica ao debate, questionando-se sobre as suas implicações para pesquisas e práticas em Educação Ambiental.
Palavras-chave: **Povos Originários. Colonialidade. Racionalidade Ambiental. Sintropia.**

Introduction

Environmental issues emerged on the international agenda in the 1960s and 1970s in response to the growing public and political concern with the environment (Sterling, 1992), which was caused by the environmental consequences of the post-war economic boom, also known as the Golden Age of Capitalism (Marglin; Schor, 1992).

By then, there was already accumulated evidence of environmental impacts reported by individual and collective initiatives, such as the books *Silent Spring*, by Rachel Carson, in 1962, and *The Limits to Growth*, by the Club of Rome, in 1972. However, the UN Conference on the Human Environment held by the United Nations (UN) in Stockholm, in 1972, was the main factor boosting the diffusion of debates as well as the institutionalization of the environmental agenda in different countries.

The Stockholm Conference reaffirmed the incorporation of the environmental debate within the UN and triggered a series of actions focused on strengthening that agenda, such as the launching of the United Nations Environment Program (Sterling, 1992). Subsequently, successive conferences, agreements and multilateral commitments started to bind UN member countries together (Marglin; Schor, 1992).

As the environmental agenda spread worldwide and was incorporated by countries, it triggered different reactions. On the one hand, it was supported, for example through the criticism of 'civilizational development' as a project (Furtado, 1974). On the other, it was completely rejected by the Brazilian Military government at the Stockholm Conference (Dias, 1998) for example. Another phenomenon, which was far more complex, took place between these extremes: the appropriation and adjustment of environmental discourses by different ideological and interest matrixes (Sachs, 1995).

New stakeholders' proximity to the environmental issue led to the expansion and complexification of the environmental field, which consequently became a "contradictory and diverse field of discourses and values [forming] a broad set of environmental ideas" (Carvalho, 1998, p. 114). Those sets of ideas would have no distinct boundaries or precise shapes (IBID) and would change over time.

One of the consequences associated with the spread of the environmental agenda around the world and with the resulting expansion of the field was the emergence of clashes among different discourses and values which, as Sachs (1995) stated, turned ecology into *a new arena of political conflict*. According to that author, from the moment when even the most loyal technology and economic growth enthusiasts became environmentalists, the matter was no longer about who was, or was not an environmentalist. It was about the kind of environmentalism each one stood for.

In the attempt to bring some intelligibility to the environmental field, typologies started being created. Pepper (1997), for example, featured Deep Ecology (and *New Age* trends) and Social Ecology as the

prevalent trends in the field, and went on to characterize and to present critiques of each one of them. Moreover, that author suggested an organization of the field based on the proximity of those trends either to anthropocentrism or to biocentrism, to ecocentrism or to techno-centrism, and to mechanical philosophy or to organicism.

Another example of an organizational typology of environmentalist thinking was provided by Foladori (2005). The author started his proposal by dividing environmental ideas into two major lines of thought: Ecocentrism and Anthropocentrism. Then, he subdivided them into more specific subcategories: among the eco-centrists he identified Deep Ecology and the Greens (mainly formed by the emergence of green parties), and among the anthropo-centrists, the techno-centrists (then subdivided into moderate and cornucopian environmentalists) and Marxists. Besides that organizational proposal, the same author presented some references that grounded each of the types and subtypes, and highlighted what they acknowledged as causes of the environmental crisis and what they felt should be done to mitigate it.

Although there may be many other proposals to organize environmental thinking into typologies, the ones mentioned here are only intended to illustrate the attempts. However, it is worth emphasizing that not all typologies play the same role, since some are only intended to map the field, i.e., to suggest shapes for something erratic, whereas others (such as the two typologies presented above) also make judgments about the values defended by each one of them. Thus, they reveal contradictions and conflicts about explicit or implicit political alignments associated with them. The manifestation of these differences and the reflections about them are the core of the political conflict *arena* established in the ecological debate suggested by Sachs (1995).

Environmental education (EE) emerged within this modern environmentalism's genesis, evolution and complexification process. EE's history attributes the origin of this term to the second of a series of conferences named *The countryside in the 1970s*, held in the United Kingdom, at Keele University, in 1965 (Sterling, 1992). Since then, this field has grown and, just like the environmentalist movement, it has become more complex.

The attempt to understand both the trajectory and complexity of the EE field also led to the development of different typologies. They are available, for example, in the study conducted by Lucas (1972), who organized the diversity of EE visions and practices into education *about*, *in* and *for* the environment; in the study conducted by Robottom and Hart (1993), who addressed *histories* of EE based on positivism, liberal interpretivism and social critique; as well as in studies conducted by Sauvé (2005) and Payne (2009). Some proposals for typologies in Brazil can be found in Sorrentino (2000), Carvalho (2004) and Layrargues (2004).

Although the current usefulness of EE typologies has been questioned (Carvalho, 2020), their historical contribution to EE field is undeniable. They helped frame ongoing events, the differentiation and assertion of different existing trends' stances and, why not, their struggle for hegemony (Ferraro Júnior, 2013).

One of the overall trends mapped out among the myriad of EE lines is categorized as critical EE. In general, critical EE is marked by its detachment from non-critical EE (also called conservative, naïve, among other terms), which, in turn, is noted for by its content-based, biological, pragmatic (Layrargues, 2002), moralist and normative nature (Ferraro Junior, 2013). Obviously, it is also noted for its demand for critical and emancipatory EE (Sauvé, 2005; Carvalho, 2004; Sorrentino, 2000).

Although there is no consensus as to what the *critical* would be in critical EE (Ferraro Júnior, 2013; Iared et al, 2021), this trend made great contributions to the field, since it pointed out the limitations of understandings that attributed a merely biological, ecological and managerial approach to EE and neglected the social or sociological dimensions of life.

Thus, critical environmental educators advocated (and still advocate) for the importance of making explicit "values and vested interests of individuals and groups who adopt positions with respect to a given issue" (Palmer, 1998, p. 114). Consequently, EE would also become a place to unveil ideological assumptions, and notions of power and control of those involved in a given topic. According to Robottom and Hart (1993, p. 11), "becoming critical means developing an analytical posture towards arguments, procedures and language by using the lens associated with power and control issues in relationships, as well as by developing an action-oriented commitment to common welfare".

Therefore, critical EE would fill a gap that kept this field sociologically poor (Layrargues, 2006). The incorporation of the social dimension to the environmental one to form the socio-environmental dimension brought *people* and *societies* back to the environmental discussion, based on the perception that every environmental impact also affects people and social groups, albeit in different ways, depending on social, economic, gender and racial conditions, among others. Fields of thought, such as environmental justice and environmental racism (Bullard, 2001), emerged from that process of crossing biological and ecological issues with social ones.

Thus, the emergence of a critical trend of EE meant a leap of quality from a collective imagery that perceived EE as a matter of understanding ecological concepts, of learning to fight waste-generation, pollution, water-consumption, deforestation and so on, to a perspective that acknowledged the need for implementing much broader, civilizational, political transformations (Meira, 2009; Goergen, 2014).

So, similarly to what was observed in the 1970s, 1980s and the 1990s, when there was a growing introduction of contributions from critical EE into EE practices, especially in the research context (Robottom, 2005), there is an identifiable need here, for a new inflection in the field; the time has come to question certainties and to review positions that have long been naturalized, as Carvalho (2020) has stated. However, this time, the origin of such contributions does not lie in the usual academic fields, but in the emergence of rationalities seen as unlikely until quite recently, namely, those produced by indigenous peoples of the Americas, Africa, and Oceania (Santos, 2019).

Against that background this study sets out to investigate contributions arising from the emergence of indigenous peoples' thoughts to the environmental debate, mainly with respect to the resumption of the concept of biocentrism, and to address some implications of this resumption process for EE.

To that end, this paper is organized into four sections. The first section focuses on featuring the concept of decoloniality, and outlining how the political emergence of indigenous peoples, mainly from the late 1970s onwards, has contributed to the academic field and its traditional sociological analysis repertoire. The second section addresses some specific contributions from this emergence to EE field, mainly related to the concept of biocentrism. The third section presents reflections about those contributions and, finally, the fourth section presents the research conclusions.

Coloniality and decoloniality

Anibal Quijano (1992) shows that colonialism not only dominated territories and bodies, but also spread, across these territories, a rationality produced in the power centers of different metropolises. For 500 years, that spreading process defined a world order that has culminated "in a global power capable of articulating the entire planet" (Quijano, 1992, p. 11, our translation).

Thus, although colonialism was defeated in most countries worldwide, it implemented in them a rationality based on social discrimination as the framework of social relations. It was carried out by keeping peoples from colonized territories subject to racial, ethnic, anthropological, or national derogatory codes that persist to this day, and upon which other social relations are established. In other words, despite the *official* end of most colonial-political relations on the planet, the roles occupied by these bodies, peoples and by their territories in the world order remain basically the same, as well as the rationality operating it, which is currently actively reproduced also in former colonies. The maintenance of this rationality and of its practical consequences in different realities is exactly what constitutes the essence of coloniality (Quijano, 1992).

According to Santos (2019), the social discrimination policy imposed by European colonizers promoted the establishment of an "abyssal line" (p. 41, our translation) on the planet, which divided

human beings into two different groups: on the one hand, humanity, in Europeans' image and likeness; and, on the other hand, *sub-humanities*. This would be the outcome of the "Western racist hierarchy" (Ferdinand, 2022, p. 23, our translation). Thus, what is perceived in the West as humanity is actually "a select group that does not accept new members" (Krenak, 2020a, p. 82, our translation). *Sub-humanities*, in their turn, are formed by peoples from colonized countries, with whom there is no possibility of "equivalence or reciprocity" (Santos, 2019, p. 43, our translation). There are "thousands of people who insist on staying away from this civilizational dance, from the technique, and from the control of the planet. And because they dance a strange choreography, they are taken out of the scene by epidemics, poverty, starvation, and targeted violence" (Krenak, 2020b, p. 70, our translation). According to Quijano (1992, p. 12, our translation):

> In fact, if one observes the main lines of social exploitation and domination on the global scale, as well as the matrix lines of current world power, their resource and labor distribution among the world's population, it is impossible not to see that the vast majority of the exploited, dominated and discriminated individuals are precisely members of 'races', 'ethnicities', or 'nations' which the colonized populations were categorized as, in the world-power formation process.

One of the consequences of sub-humanities' production was their invisibility and disposability by the Eurocentric thinking (Santos, 2019). Consequently, the modern project, based on the idea of humanity as a totality ruled by the same set of principles, did not see or did not want to see that this 'humanity' did not, and does not, allow enough room for everyone.

The exclusion of all these *others* in the analysis of what humanity is, resulted from an operation of sociological production of absences, which is nothing more than the active production of the 'other' as absent, or as a non-credible alternative to what exists (Santos, 2002). Thus, from the very beginning, *sub-humanities* were categorized as inferior, archaic, savage and "pre-Newtonian" (Rostow, 1990, p. 4); groups whose cultures should be replaced by the more evolved European/Western/industrial/capitalist one. Peoples, cultures, epistemologies, and cosmologies were at risk from the very beginning.

An "essential push" which triggered a change in this process happened, according to Santos (2019, p. 28, our translation), in the late 1970s and early 1980s, when struggles by indigenous peoples from the Americas, Africa and Oceania began to shape proposals and to expand political agendas in some countries, revealing "new facets of social experience" (p. 29, our translation). That process started to make the abyssal line explicit for *humanity*, and to reveal the invisibility and disposability strategies promoted by European political thought (Ibid).

In that context, the very limits of critical theory were evidenced, since, based on the premise that humanity is a complete and homo-

geneous totality, it considered that humanity as a whole could be ruled by the same principles and that it would be subject to the same social mechanisms and, consequently, that the pathways of emancipation would be valid for all (Santos, 2019). However, the explicit revelation of the abyssal lines showed that they would not. That what was considered to be *all* was actually the group subjected to the European rationality and life project. According to Santos (2019), the epistemology of critical theory had collided with ontology.

The political emergence of indigenous peoples and, consequently, the increased access to their thoughts from the 1970s/1980s onwards, enabled the non-indigenous side of the abyssal lines to see a world that had always been there, but that had been hidden by epistemological erasure operations. Their works started functioning as 'counter-anthropology' (Castro, 2015, p. 24, our translation), since they provided different interpretations of life and things based on other cosmologies and, equally strikingly, characterizations of white lives based on non-Western references. White European rationality, which was so used to being the subject of the observation process, became the observed object.

One of these counter-anthropologies – with the title *The Falling Sky* (Kopenawa; Albert, 2013) – depicts whites as "cannibal spectra" (Castro, 2015, p. 13, our translation) who have forgotten their origins and culture, who live under deplorable conditions and have petty dreams, reduced to an unlimited desire for "poisonous goods" (Castro. 2015, p. 13, our translation). They are earth eaters and "enemies of the Forest" (Kopenawa; Albert, 2013, p. 252). Tukano (2022), in turn, questioned the arrogant, missionary, and salvationist attitude of the Western world, which stands as the savior of all, but that is actually lost and cannot even save itself.

Thus, the emergence and acknowledgement of other ways of seeing, as well as of living in and with the world can provide whites with different parameters for reflecting on their own lives and culture, as well as unveiling other possible pathways for building both their thoughts and their future. Given the catastrophic environmental scenario constructed by the West in the last 500 years (see Crutzen, 2002; Steffen et al, 2015a; Steffen et al, 2015b; Persson, 2022, for example), one that has only worsened over time, despite global mobilizations and broad investments (Krenak, 2020a), challenging its rationality through insights from other cosmologies can be extremely beneficial, since, so far, the West has not shown itself to be capable of solving the problems it has created on its own.

Therefore, according to Castro (2015, p. 15, our translation), we "must listen to indigenous peoples". Despite all the violence they have been and continue to be subjected to, they want to be heard; they want their perceptions about what we are doing to them, to the world and to ourselves, to be disclosed, reported, and heard (Kopenawa; Albert, 2013; Yxapyry, 2022).

Moreover, listening to the indigenous voices is more than a mere ethical duty. It is also highly recommended, since they are the ones on this planet who have managed to resist the West and its 500-year-long violence and destruction. When acculturation presented itself, they indigenized themselves (Xacriabá, 2022). According to Krenak (2020a, p. 111, our translation), "indigenous peoples remain in this world because they escaped, rather than because they were not excluded from it."

Therefore, at this point, when the West itself also needs to learn how to survive, listening to indigenous wisdom can provide key tips to those, such as environmental educators, who want to bring about meaningful change but have already perceived the limitations of their own rationalities for enabling that.

According to Krenak (2020b, p. 45, our translation), "everyone needs to wake up," because if, for a long time, indigenous peoples were the only victims of the Western project, nowadays, even Western people are at risk. According to Kopenawa and Albert (2013, p. 296):

> This is why now I want the white people to hear these words too. These are things that we shamans speak about very often when we work together. We refuse to let the minerals that *Omama* hid underground be touched because we do not want any *xawara* epidemic fumes in our forest. My father-in-law often tells me: "You must tell the white people that! They must know that we are dying one after the other because of this evil smoke from the things they tear out of the ground!" This is what I am now trying to explain to those who will listen to my words. Maybe it will make them wiser? But it is true that if they continue to follow this path we will all perish. This already happened to many other people of the forest in this land of Brazil, but this time I think that even the white people will not survive.

Thus, learning that the world is formed by a plurality of cultures which, in turn, reflect a wide diversity of epistemologies and ontologies, can help the EE field in the process of challenging some of its established certainties, as Carvalho (2020) has observed. It is necessary, among other things, to reflect about those certainties that are strongly grounded in the Western hegemonic rationality and, through that process, perceive the power of coloniality that may be operating in and through environmental educators.

Furthermore, the contact with other ontologies and epistemologies teaches us that Western rationality is not the only one, and that there are many contributions that can be learnt from different ways of life, principles, values, and experiences. Some of them are more formalized, such as the Ecological *Swaraj*, in India, and the *Buen Vivir* originated from Andean peoples' experiences (Kothari; Demaria; Acosta, 2014). However, there are probably as many other contributions as there are non-Westernized peoples, worldwide.

Therefore, the world is not, and does not need to be, a monoculture of the mind (Shiva, 1997). This may be a way out from many current Western issues, mainly environmental issues. According to Shiva

(1997), different possible paths erased from individuals' perceptions long ago are all still out there. They are the memory of other world perspectives (Krenak, 2020a), and bringing them back to the West requires openness to the idea of diversity as a mode of thought and context of action (Shiva, 1997).

Decolonial contributions to environmental education: biocentrism

Insights from decolonial thinking can significantly contribute to EE. What is new is that it overcomes the separation between colonial and environmental histories of the world (Ferdinand, 2022, p. 23). The mix of these two histories provides fundamental answers to help better understanding of the motivations that reproduce the current environmental degradation. Where does the West's insatiable 'appetite' for nature come from? Where does this civilization pattern that foments a continuous war against life-supporting factors come from (Lander, 2016)? It is not possible to disassociate the mercury-contamination of rivers by gold mining activities carried out in the Amazonian region, in 2023, from the arrival of the caravels, back in 1500, in a place that would come to be called Brazil.

Despite the large number of contributions in this context, this paper focuses on addressing just one of them, namely the debate enabled by decolonial voices about the anthropocentrism/biocentrism issue.

The issue of the conflict between anthropocentrism and biocentrism is not new in the environmental field. According to O'Riordan (1989), it dates back to 1967, at the least. In essence, this issue highlights tensions between two different worldviews according to which, terms of morality and rules of conduct for humanity, respectively, are dictated either by human ingenuity and spirit of competition, on the one hand, or by nature, on the other hand.

One of the incorporations of the idea of biocentrism to environmentalism took place through the emergence of the concept of *deep ecology*, which was created by the Norwegian philosopher Arne Naess (Vandeveer; Pierce, 1997). According to the authors, biocentrism is an ethics based on the perception that all living beings have equal moral or intrinsic value. This ethics also considers rivers, landscapes and ecosystems as *living* entities.

The biocentric approach has been strongly criticized within that "contradictory and diversified field of discourses and values" (Carvalho, 1998, p. 114, our translation) that forms the environmental field. At the core of these criticisms has been the stance that this line of thought is "naïve" (Bookchin, 1997, p. 233). It has been considered so for the following reasons: because it allegedly focuses the analysis of environmental issues on changes in individual values and attitudes; because it disregards social issues deriving from differences in power distribution in society; because it ignores the change-blocking powers exercised by state institutions and corporations; because it only cares about wildlife preservation and very little, if at all, about social justice;

because it is based on mystical beliefs and intuition, rather than on reason; and, finally, because it sees the origin of environmental issues in industrialism, in general, rather than in capitalism specifically (Pepper, 1997). Several other categories of criticism directed at biocentrism can be found in Pepper (1997) and Bookchin (1997).

Bookchin (1997) stands out among other authors as a "severe and irreverent" critic of deep ecology and, therefore, of biocentrism (Vandeveer; Pierce, 1997, p. 219). According to that author, biocentrism supporters participate in "mystical" and "anti-rational" movements (Vandeveer; Pierce, 1997, p. 220). They are members of quasi-religious cults that revere nature and often depreciate humans, and that are based on references that form a "bizarre mix of Buddhism, Taoism, Native American beliefs, Heidegger and Spinoza, among others" (Bookchin, 1997, p. 232). At the end of all this, they propose the "regression to prehistoric religiosity" (p. 232) and reduce humanity's place and role in the Cosmos. According to Bookchin (1997), Deep Ecology is "little more than a naïve prayer" (p. 233).

Despite criticisms, biocentrism gained an ally from the scientific universe in the early 1970s: the application of the concept of entropy - originated in thermodynamics - to the functioning of the economy. This intimate relation between economy and the functioning of nature was unveiled, among others, by Nicolas Georgescu-Roegen in his work with the title *The law of entropy and the economic process* (Georgescu-Roegen, 1971).

Georgescu-Roegen's work presented economic production as an "irreversible process of entropic degradation, as well as of low entropy transformation into high entropy" (Leff, 2006, p. 174, our translation.). Consequently, matter and energy go from abundance to scarcity, from usefulness to uselessness, as well as from use to waste throughout this process, affecting the self-organization of life-support systems on the planet, on which even the economy depends.

This would be the outcome of the practical application of an economic rationality which is based on a mechanical pattern of thought that denaturalized, fractioned, and mutilated nature, that ignored its systemic functioning and transformed its goods into discrete resources - as if they were isolated and independent from each other. As such, they became raw materials whose usefulness is extremely limited in time and whose inexorable future is uselessness (Leff, 2006). This increasingly accelerated degradation of energy and matter represents interruptions in the very flows which make life possible (Lander, 2016).

Thus, the analysis of economic rationality from the thermodynamics' perspective has established natural limits to economic growth. These limits have challenged classical economic theory and the very rationality it is based on (Leff, 2006). By doing so, such analysis unveiled the fact that the question was not merely situated in the technical dimension as referring to matter or energy, but it also attained the ontological dimension. The entropy issue has made eco-

nomic rationality's detachment from the laws of nature explicit (Ibid.), and as a result, it has renewed the debate between anthropocentrism and biocentrism, although from a different perspective.

A little more than 50 years after the publication of Georgescu-Roegen's work, the consequences of continuous application of classical, high-entropy economic rationality are all out there. From microplastics and emerging pollutants (Persson, 2022) to climate change (Ripple et al, 2022), as well as to the suspicion that *humanity* is causing the sixth mass extinction (Cowie et al 2022); the ecological footprint of the West is so high and interrupts so many life processes that debates about whether this phenomenon is significant enough to typify a new geological era - the Anthropocene - are taking place (Crutzen, 2002). Once again, the environmental issue is asserted at the level of civilization (Meira, 2009; Goergen, 2014).

Given this scenario, the political emergence of indigenous peoples (Santos, 2019) in the late 20th century brought along the resumption of the debate about biocentrism and anthropocentrism. According to Krenak (2020a), biocentric ideas have always been marginalized in the West and their proponents discriminated against for defending anti-scientific ideas.

Krenak (2020a) asserts that this marginalization led to the destitution of the Earth and to the institution of capitalism as a living organism. Consequently, he claims that we have become consumers of the world, and that we interrupt flows of life at some level at every step we take, since birth. Thus, he warns us about the need to abandon anthropocentrism and develop other cosmic experiences with the world.

However, Krenak (2020a) stresses that, lately, there has been a movement to bring science closer to those who listen to "the different languages used by the Earth's organism to communicate with us" (p. 19, our translation).

In fact, academia has recently become more open to indigenous voices, at least in Brazil. This can be illustrated, for example, by the award of *Doctor Honoris Causa* degrees to Ailton Krenak by Federal University of Juiz de Fora (UFJF), in 2016, and by University of Brasília (UNB), in 2022. Also, to shaman leader Davi Kopenawa Yanomami by the Federal University of São Paulo (UNIFESP), in 2023. Given the expressiveness of Kopenawa's work *The falling sky* (Kopenawa; Albert, 2013), which is considered a "new bible for emerging ecological movements" (Coccia, 2023, p. 16, our translation), he was elected member of the Brazilian Academy of Sciences in 2021.

The indigenous political emergence has evidenced Anthropocentrism's violent and dangerous means and ends. According to Krenak (2020b, p. 69, our translation), "we created this abstraction of unity, men as the measure of things, and we went around trampling everything to convince and make everyone accept that there is a humanity they identify with, by acting in the world [as if it were] at our disposal and by taking whatever we want".

Tukano (2022 p. 50-51), denounces how

> [...] we, as humanity, ended up creating models that are perhaps so artificial, that they come from our illusion of wanting to proclaim ourselves the center of everything. This thinking belongs to those who believe that there is a navel in the world and that it lies in Europe [...], that humans are at the center of everything, of the Universe, being a divine replica. Thus, precisely the actions triggered by this anthropocentrism, by this apocalyptic situation we experience nowadays, are the sixth largest mass extinction on the planet (our translation).

For this very reason, indigenous decolonial voices affirm that defending life is the main goal in the debate about the reconstruction of our civilization, in the face of anthropocentric productive organizations that keep on pressuring and surpassing nature's limits, putting at increasing risk life-support systems and life-regenerative processes (Acosta, 2016). As Krenak (2020b, p. 46, our translation) puts it, they "...place us in a dilemma where it seems that the only possibility for human communities to keep on existing is to exhaust all other parts of life". The West is, therefore, a "project to exhaust nature" (Krenak, 2020b, p. 41, our translation), according to which, producing (and living) is an activity carried out at the expense of life (Mignolo, 2021).

Therefore, it is necessary to implement a process to transit from the anthropocentric paradigm to a biocentric or socio-biocentric one. According to Acosta (2016), this is the greatest challenge faced by the West nowadays, since it involves all sectors of life: it includes Law, transcending the limits of traditional Environmental Law to reach the Rights of Nature; it includes Justice, going beyond demands for environmental justice to reach ecological justice, which acknowledges non-human beings' rights to exist (Svampa, 2016); and it includes productive activities, which in their turn must rule out energy-wasting and garbage-generating entropic processes and implement regenerative syntropic processes (Pasini, 2017; Rebello; Sakamoto, 2021), steps which help in expanding conditions favoring the flourishing of life, rather than its interruption.

Ultimately, the transition to biocentrism repositions Westerners back *in nature* and acknowledges their full interdependence with it. In that way, it removes from them the feeling of being immune to what happens *in nature*. This transition will take place through processes that question and overcome not only the socially unfair Western modes of production and consumption, but also the rationality that keeps these processes in operation (Acosta, 2016). That is why it is so important to resume the ontological discussion. Otherwise, struggles in the West will be limited to the pursuit of hegemony over a way of life that will destroy nature.

Thus, decolonial contributions reveal that Western ontology, albeit extremely powerful, is just another one among a wide diversity of worldviews. Also, that once acknowledged as valid, these other worldviews pose questions that go far beyond those that are possible to be raised when the West looks at itself from a universalizing per-

spective (as if the West were the whole world). In other words, they show the unfeasibility of the project designed by the West for the world since colonization, the essence of which is devastating for different peoples and for nature (Acosta, 2016). This perspective, which goes way beyond Western views, questions and answers, is certainly a great source of contributions towards thinking about and implementing EE.

Reflections based on decolonial contributions to environmental education

Firstly, it is necessary to point out that the concept of biocentrism is a Western construct. As such, it is not capable of fully embracing the experience of those who do not name it but live in a biocentric manner. Thus, there is a civilizational incommensurability (Kuhn, 1998) within which the West can only draw a sort of stereotype when it proposes the concept. This factor justifies the proposal of this paper since, in historical terms, biocentric proposals analyzed and criticized by environmentalism and by EE have come from the West. However, analyzing this concept, based on contributions from indigenous peoples who live in a biocentric manner, can lead to new reflections.

In the West, the idea of biocentrism tends to be limited to what can be perceived by its rationality, which often reduces individuals' experiences to what is observable and measurable (Morin, 1990). Therefore, the idea of the concept remains focused on matter and energy flows (Krenak, 2020b), on the interdependence between living beings, on human de-hierarchization and on the idea of material totality.

However, what this concept entails goes far beyond in indigenous peoples' perspectives, since it encompasses a kind of kinship with every living thing, that takes place through ancestral relationships with the spirits of other life forms, both past and present (Coccia, 2023). Therefore, this connection is not only cognitive, but experiential.

According to the Yanomami cosmology, for example, present day animals are human ancestors who metamorphosed themselves into animals, so game animals are acknowledged as "ancestors-turned game" (Kopenawa; Albert, 2013, p. 61) and they are "inhabitants of the forest as much as we are" (p. 61). Consequently, when these people eat, they believe that "we eat our people, our brothers" (p. 387).

The Krenak people, in turn, believe that the river flanking their territory (Doce River) is their grandfather. Thus, they feel the river as a person, as part of their "construction as a group inhabiting a specific place" (Krenak, 2020b, p. 21, our translation). In fact, the identification of their territory starts with the very name of their ethnicity, Krenak, whose etymological origin refers to the head of the earth (nak = earth; kren = head) (Cohn, 2015). Thus, indigenous peoples establish kinship relationships with the world around them.

Similarly, their relationship with the cosmos takes place through dreams. Dreams are a place for learning about the world and the cosmos (Kopenawa; Albert, 2013), as well as for language learning, resource appropriation and communication with spirits. Dreams are bonds of affection and a kind of collective consciousness (Krenak, 2020a). They are seen as time to listen to the wise ones (Cohn, 2015). This idea of dream is expressed in Sibupá Xavante's speech in Jecupé's work (1998, p. 9, our translation):

> I had a dream. The world's creator showed up and told me that the animals are disappearing, dying, or running away. We need to find a way to increase the number of animals, to protect the places they live in. It is so, because if the indigenous people stop eating game, they will stop dreaming. And dreams of power are the ones showing the path we should follow.

These few examples show that what the West calls biocentrism is, in indigenous peoples' perspectives, a much subtler experience that is lived through so many ways that we cannot even describe. Many of them are even unknown by, and unattainable through Western rationality. Nevertheless, they represent an "infinite source of knowledge [...] that will not necessarily be submitted to a possible translation, respecting the silence, the sacred, the secret, the untranslatable..." (Tukano, 2022, p. 52, our translation).

From a pedagogical perspective, it is essential to acknowledge the difference between Western biocentric theoretical proposals and indigenous peoples' ideas and experiences described as biocentric. If the matter of connection with nature is so important for EE, as well as so poorly investigated (Fletcher, 2017), when individuals talk about connecting with nature, what kind of connection are they referring to? What kind of connection would be possible to be attained based on the limits of Western rationality? What would the implications of these questions be for EE pedagogical practices? Decolonial contributions have indicated that the *physical* disconnection in the West, easily perceived through Western lenses, happened along with a profound epistemic operation that led to an ontological repositioning process.

A second reflection emerging from indigenous decolonial voices' contributions is associated with the criticisms of the idea of biocentrism by some modern environmentalist trends, as seen above. Those criticisms assert that biocentrism reflects a naïve perception of reality; it is little more than a prayer (Bookchin, 1997).

Indigenous contributions, however, have indicated that the biocentrism they experience is not a naïve orientation; it is not focused on the individuals since all people are beneficiaries of collective experiences (Cohn, 2015), and it does not neglect differences in power or the extant social conflicts. This is evident in the histories of these peoples (Kopenawa; Albert, 2013; Cohn, 2015; Krenak, 2020a; 2020b; Tukano, 2022; Xacriabá, 2022; Yxapyry, 2022), which are histories of resistance, organization and survival in the face of a culture that has

sought to annihilate them from the earliest days (Quijano, 1992) to contemporary times (Yxapyry, 2022).

Thus, besides not denying social conflicts, not disregarding institutional difficulties, not ignoring the predatory power of capitalism, and not promoting exclusion among themselves, they advocate that the struggle for all these issues cannot be dissociated from the struggle to reproduce regenerative modes of life capable of safeguarding their cosmologies and life itself. They know that both their future and their culture are closely linked to the future of the planet (Barragán *et al.*, 2016). In other words, besides not seeing societies and nature as entities whose futures can be thought about separately, they do not hierarchize this separation by putting environmental goals in second place (Gudynas, 2016). Thus, the criticism is redirected back to the West from an ontological perspective: if the available alternatives are not syntropic and regenerative, the future will be the same. According to Acosta (2016, p. 26, our translation), "the doors must be opened to a broad debate so we can change to a State type that is not tied to Eurocentric traditions"; indigenous decolonial contributions introduce us to a kind of critical biocentrism.

The fact that first peoples' cultures are grounded in biocentric ontologies and that, at the same time, they bring with them concerns inherent to Western critical theories, shows that biocentrism is not necessarily opposed to these demands. In other words, that biocentric worldviews do not necessarily mean sociological naivety, since, as previously mentioned, they claim that the struggle for social rights and territory is inseparable from the struggle for life.

In fact, it is not possible to categorize Yanomami peoples' and Chico Mendes' movements in Brazil, the Chipko movement in India and Wangari Maathai's *Green Belt* movement in Kenya, to name a few, as naïve. They are well aware about the extreme violence, about injustices and power asymmetries, about the weight of institutions and the destructive strength of capitalism; it is all there as well as the combat, resistance and re-existence struggles. Nevertheless, the preservation of life remains the fundamental factor fostering and guiding these processes.

This deduction raises questions as to the adequacy of some of the criticism directed at biocentrism. If the opposition between biocentrism and social critique is not mandatory nor absolute, what then could have generated this opposition?

One of the possible answers to this question is that this opposition results from an epistemic construction that cannot perceive the world other than from a Cartesian, fragmenting, cognitive organization. As a result, it dissociates phenomena of reality in a quest for intelligibility, but it naturalizes that dissociation as if it were reality itself (Bohm, 1995). In other words, if a phenomenon cannot be fully visualized by a theory, then the problem must be ironically the phenomenon itself, and not the theory and its premises. Therefore, this factor

makes room for the very epistemic organization of thought that motivated the criticisms to be analyzed.

A second point to be discussed here is whether the comparison itself, or the opposition between biocentrism and social critique is adequate. As seen in Foladori's typology (2005), biocentrism and anthropocentrism both belong to the same dimension of thought: ontology, so comparisons between them are pertinent. However, biocentrism and social critique belong to different thought dimensions, to ontology and (social) theory respectively, so they cannot be compared to each other; at least, not to the extent of mutually excluding one another, as in claims that something is either biocentric or socially critical. From a thought organization perspective, that association does not make any sense.

Furthermore, it raises the question about whether this analytical mistake of pairing categories belonging to different abstraction levels is what would have led to the conclusion that biocentrism is intrinsically naïve or that biocentrism and social critical theory would be mutually excluding. In any case, this discussion deserves to be further addressed in EE, since it can collaborate towards the self-analysis of its assumptions.

Thirdly, an even subtler aspect about the adequacy of the criticisms of biocentrism concerns the pertinence of the discreet organization between biocentrism and anthropocentrism categories and their subcategories, since this arrangement leads to a mandatory separation (if something is biocentric, it is not critical!) that, at least based on indigenous contributions, does not have universal validity.

From this perspective, the question to be raised is associated with the very nature of typologies. They create 'pure ideal types' whose capacity to mirror reality decreases as criteria set for their composition get stricter (Weber, 1947, p. 110). According to that author (p. 110), "it is probably seldom if ever that a real phenomenon can be found which corresponds exactly to one of these ideally constructed pure types". In other words, typologies' value increases as the awareness of their roles and limits also increases. Would EE be disregarding the relevance of a critical perspective about typologies' validity, that is, not reflecting about their roles and limits and, consequently, transforming ideal type descriptions into reality? Carvalho's (2020) questioning heads in this direction, and in this sense, the debate about biocentrism, from indigenous decolonial perspectives, is seen as an opportunity to further investigate whether Western cognitive categories, as they are defined, are enough to help understanding reality in a more complex manner (Druker-Ibáñez; Cáceres-Jensen, 2022).

Finally, a fourth point that stems from the analysis applied to the suitability and limits of Western rationality for the appreciation of environmental phenomena lies in the issue of rationality itself. When arguments against biocentrism are based on allegations that it is naïve because it is based on other cosmologies or worldviews, such as "Buddhism, Taoism and indigenous peoples' beliefs" (Bookchin, 1997,

p. 232), and that, consequently, it is 'irrational' (p. 231) and 'anti-rational' (p. 233), it manifests the coloniality of knowledge (Quijano, 1992) in operation, since it maintains the claims of Western rationality's superiority by erasing or delegitimizing others (Quijano, 1992; Shiva, 1997; Santos, 2019). This type of statement cannot be sustained in a world where the environmental situation, caused exactly by Western rationality, is as it is. At the end of the day, what is on the agenda? Is it the environmental issue and the defense of life, or the maintenance of the Western rationality and its project for the entire world, at any cost?

Conclusion

Decolonial contributions from indigenous peoples bring back the discussion about biocentrism, but they take this discussion to another place. When this concept is analyzed based on the background of their stories of resistance to all types of violence, both physical and symbolic, most of the criticism directed at it does not make sense.

Biocentrism is not intrinsically naïve and, as an ontology, it can ground critical perspectives. Thus, struggles for social justice do not need to be dissociated from, disregard or devalue the defense of life. Indigenous histories have taught us that.

For that to happen, however, a decolonization of collective imageries is necessary, to enable theoretical associations where such theories have traditionally been kept separated. In a way, proposing a form of critical biocentrism is what decolonial thinking is doing.

Moreover, the analysis carried out in this paper has identified issues, concerning both the adequacy and limits of Western rationality, which have grounded some of the criticism of biocentrism. Epistemological, theoretic, and even political questions have been raised, as witness the identification of arguments critiquing the concept which were associated with an affirmation of coloniality.

In addition, the debate about biocentrism has resumed questioning the role played by ontologies in guiding theories' design, as well as in the associations among ontology, epistemologies, and theories. It is essential that EE takes on this discussion, mainly due to the emergence of these *new* indigenous ontologies that had previously been erased. As shown above, the EE field can significantly benefit from listening to these *new* voices, especially if it acknowledges their ability to contribute to several dimensions of thinking.

Finally, acknowledging the relevance of the ontological dimension of thought to environmental matters leads to the question of how EE can specifically act on this dimension, to generate new questions and practices that can be critically transformative. After all, if profound transformations for an entire civilization are what is desired, can they be achieved without involving the ontological dimension of thought in the process?

Received June 12, 2023
Approved September 19, 2023

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Availability of research data: the dataset supporting the results of this study is published in this article.

Editor in charge: Luís Henrique Sacchi dos Santos