CHAPTER 13

Rethinking Historical Approaches for Science Education in the Anthropocene

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"Este es un mundo al revés.
Este es un mundo de mierda.
Pero no es el único mundo posible."[1]
—Eduardo Galeano, in an interview to #acampadaBCN, a social movement occurred in Barcelona in 2011

Climate changes experienced in different parts of the planet indicate that the Earth may be rendered inhospitable to human life soon. What once seemed more like a science fiction movie plot is now an urgent reality that is increasingly part of political and academic debate. Political actors, such as the young Greta Thunberg and the Yanomami leader Davi Kopenawa, have made us reflect on fundamental issues on a global scale: What are the conditions of life on planet Earth in a near future? How do we maintain human life in the (paradoxically) so-called Anthropocene era?

At the same time that such questions are regarded as fundamental to contemporaneity, the answers to them seem distant, intangible, under the

[1] Spanish for "This is a backwards world. This is a shitty world. But it is not the only world possible".

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current paradigm. As Eduardo Galeano elaborates in the opening of this text, this seems like an upside-down world: the growing of global anxieties does not seem to produce any major shifts in the ways which we think and live (with) the Earth. Santos (2016) formulated this apparent paradox through what he calls the crisis of the Western society's paradigm, which is directly linked to Western modern science (WMS).[2] The author states that in times of crises like the one we are experiencing, the crisis deepens as strong questions such as those highlighted above have only been responded to with weak answers, that is, answers that do not defy the limits of WMS. According to Santos (2016), strong questions are those that challenge ways of life grounded in WMS, ones that push on, or interrogate, its boundaries. Santos' arguments are not only axiological, but also epistemological: he questions the limits of WMS knowledge systems, and the kind of epistemic responses WMS can produce as it strives to claim a unique position of universality.

The idea that we live in a new geological epoch called Anthropocene has gained momentum since the early 2000s, as the Nobel Prize winner in chemistry, Paul Crutzen, started using the term in his publications (Lewis & Maslin, 2015). The prospect that anthropogenic action has been of such a scale that it has altered the Earth's balance, profoundly changing environmental conditions, is already a consensus in the scientific community (Oreskes, 2007). Despite this, there is still a controversy regarding when the Anthropocene would have started: those who advocate the start date of 1610 claim that the "Great Navigations" (or the Age of Exploration, a period of extensive imperialism and settler colonialism that occurred between the fifteenth and seventeenth centuries) were an unprecedented process of exchange of animal and plant species, at a time when there were also profound changes occurring in the size of the world's population, which had an impact on atmospheric composition. Others state that 1964 should be the chosen date because, added to the repercussions of the great acceleration that occurred in the middle of the twentieth century, a peak of Carbon-14 was identified in the global atmosphere that year, related to the nuclear tests that occurred years before (Lewis & Maslin, 2015).

Turning now to Science Education (SE), those of us who work in the field of History, Philosophy and Sociology of Science (HPSS) and SE note that, despite the seriousness of the crisis that we briefly outlined above and the

[2] We are aware of the debates concerning the WMS / Traditional Ecological Knowledge in Science Education and the criticism about using this terminology regarding the bounds they impose (Kim et al., 2017); especially when one take into account the processes of appropriation of local knowledge (Harding, 2015). But, for clarity, what we refer here as Western modern science, based on Quijano (2000), is the way of producing knowledge developed by the end of the Middle Ages from European canons; this way of producing knowledge accounted for the cognitive needs of capitalism, and it "was imposed and admitted in the entire capitalist world as the only valid rationality and as an emblem of modernity" (Quijano, 2000, p. 343). In this way, our choice carries a political stance we sustain as crucial throughout this paper.

urgency of the theme of Anthropocene for science educators, research developed in these fields have given too little attention to such discussions. Our perplexed reaction is the same as that of Bazzul (2012), who points out that this community, gathered at a congress in Greece during a deep political and economic crisis in 2011, held discussions that seemed hermetic to the world that surrounded them at that time. On the other hand, the controversy over the initial date of the Anthropocene seems to point to an important aspect of the Anthropocene as a concept, which is its historical dimension. Choosing one or another marker as the start for this new geological era seems to us to be a decision that goes far beyond deciding on the best stratigraphic indicators—it is a decision with political implications. In summarizing the history of 1610, and the years around, known as the Age of Sail, when the "New World" was "discovered,"[3] as a great movement of species, it is not clear who started this movement, with what intentions, and what the consequences were. The same line of thinking applies to the year of 1964 and the nuclear bombs that increased the concentration of ^{14}C in the atmosphere. Who did it, with what intentions, and what were the consequences? Responses to these questions vary, depending on who is telling the story. Also, as Moore (2017) states, the way we choose to periodize the story completely changes its interpretations. Our intention is not that stratigraphers do the job of considering these factors as criteria for defining the new framework for the Anthropocene, but to point out how important it is for multiple counter-stories to be told. We argue that science education can be fruitful space for grappling with these complex considerations.

The Anthropocene can be used as an analytical lens in history and philosophy of science, though it has not yet materialized as such, given that it is a fairly new concept. Nature of science (NOS) studies have also yet to give much consideration to the Anthropocene. NOS frameworks are used to guide research and pedagogy, but have not explicitly attended to the history of science (HoS). In times of climate crisis and a future at risk, we think that such an omission may have even wider consequences than those related to HPSS in Science Teaching (e.g., Eastwood et al., 2012).

Our objective in this chapter is to underscore the importance of attending to the historical dimensions of the Anthropocene, particularly in HPSS fields of science education. We maintain that it is not possible to act in any field of research—especially in SE—without taking into account the time of strong questions and weak answers in which we live, as well as the role of Western scientific knowledge and diverse forms of knowledge. First, we seek, through a historical case study and with the support of Santos (2002, 2016, 2019), to reframe WMS, bringing other stories and other perspectives into a dialogue about its emergence and establishment. We discuss how Western modern

[3] The quotation marks used here intend to express our concerns with these expressions which for a long time have been problematized by postcolonial scholarship.

science as a knowledge system was shaped by the triad of colonialism, capitalism, and patriarchy. Such an analysis not only challenges WMS claims to universality but also honors and uplifts other forms of knowledge that can help to inform solutions for the present moment (Harding, 2015). We argue that enhancing the political-historical dimension of WMS in science education is fundamental to building futures that produce different and potentially less (self)destructive multispecies relationships.

Reframing Western Modern Science: Thinking About Other Stories that Can Be Told About Its Emergence and Consolidation

"So that is how to create a single story:
Show a people as one thing, as only one
thing, over and over again, and that is what
they become."
—Chimamanda Adichie.

In a 2009 lecture, Chimamanda Adichie, a Nigerian novelist, drew attention to the dangers of a single story. For instance, the danger of making a people, a country, or a fact to be identified by only one story. In the lecture, she emphasized how this act of essentializing a story contributed to shaping the global imagination about Africa and Africans, with devastating consequences, such as the dehumanization of Africans and "storying" Africa as if it were a place where good things do not happen. That is, as if it were not a place of creation, beauty, and poetry (Adichie, 2018). Adichie also states that the problem of the single story is closely linked to power and how it is asymmetrically distributed in the world. Therefore, questions such as how stories are told, who tells them, when they are told, and how many stories are told are all dependent on power structures.

Adichie's claims are also useful when it comes to the historiography of WMS. In other words, we still live from a historiography of (if not single) dominant stories, and this is quite evident in science education. Even when it comes to a reinterpretation of episodes that seek to bring down the glorious narratives of the "great geniuses of Science"—the famous fight against a presentist and decontextualized history—theoretical and political commitments that animate these tasks are rarely made explicit (Moura, 2019). In other words, writing a historical narrative is in and of itself an exercise of power and involves political commitments, yet these power dynamics and political commitments are insufficiently addressed in science education. Science education needs to attend in more depth to questions of "who has benefitted and who has suffered in its formation" (Nyhart, 2016, p. 7). Such efforts require a more intentional and in-depth search for other stories about the same events, or stories that reveal other historical events that help to tell different stories about science. These ideas are ones that are also being tackled by such research

fields as global history (Roberts, 2009). This is still an incipient movement inside the HPSS and science education research fields, though there are some examples of these new historiographies emerging (Moura & Guerra, 2016; Gandolfi, 2019).

Postcolonial and feminist scholarship similarly challenges Western modern science's claims to universality, exclusivity, and totality. Santos (2002) argues that WMS grounds itself mostly in these three premises and that the obsession with these premises blocks possible understandings of the world that can exceed WMS. Moreover, Harding (2015) contends that WMS appropriated the observation of Indigenous people about their environment and their knowledge from the fifteenth century and marginalized this knowledge by framing it as myth, magic, and superstition that should be replaced by a "universal" WMS. Harding points out how WMS is also full of myth. Her work reveals how science and society are co-constitutive, i.e., producing each other.

The European territorial expansion was also guided by the same three premises of universality, exclusivity, and totality (Santos, 2002). The worldview that places outside Europe could be and should be dominated is also informed by a Christian religious understanding, that God would have given the world to humans ("Fill and subdue the earth," according to the book of Genesis). In this way, the Europeans left the territory they had occupied until the Fourteenth century to colonize others who they considered as non-beings (Santos, 2019), whose knowledge was false, and whose rules of coexistence were illegitimate. The colonization process occurred either through violence, trying to eliminate those who were different, or by assimilating the Other to the precepts of the European world, including WMS.

Harding (2015) and other feminist and postcolonial scholars tell a story about how the exploitation of natural resources and contact with other cultures boosted and helped in the consolidation of WMS, that is, in the consolidation of a universal rationality (Harding, 2015). In other words, although WMS makes claims to universality, this has not prevented WMS from appropriating cultural knowledge through colonization. For example, the specimens collected, the fossils found, the practices, and the knowledge learned in the different colonies expanded the horizons of WMS (Pimentel, 2007). However, the whole process of meeting with the Other in the colonies was understood by colonizers as a mere process of "data collection," extraction of raw material to expand scientific knowledge, rather than a two-way cultural exchange (Livingstone, 2003). Some scholarship has illustrated the importance of contact with the colonies for WMS (Pimentel, 2007; Raj, 2013), contributing to a more diverse array of "origin" stories that can be told about WMS.

In the process of colonizers' masking the epistemologies found and appropriating them as WMS, we reveal what Santos (2002) calls a waste of experience. A range of experiences and knowledge traditions around the world—that were often wider and more varied than the WMS ones—was "wasted" because they were "absorbed" as WMS production or simply neglected or discarded

(Santos, 2002). This waste also refers to what is "worth knowing": the questions and answers usually produced by WMS ended up eclipsing the experiences outside its realm. This means that in dominant stories (even in the non-Whig, non-presentist, and non-decontextualized ones), contact with the colonies is often diminished or relegated to a peripheral role in the production of WMS. If we take into account the aspects that current historians who have engaged in the task of rewriting this story are trying to clarify, we can conclude that: (1) there is more cultural/traditional knowledge from the colonies that was "absorbed" as WMS than what is often communicated in dominant histories (Raj, 2013); thus, we can question how much WMS it actually "European" or actually "universal" (even though it has asserted itself as such); (2) the epistemicide that occurred during the colonization process (and that continues to occur due to various forms of colonialism) may have narrowed possibilities for the future, as much of this knowledge engages with thinking about other forms of existence on earth (e.g., relational forms) and the coexistence with the "more-than-human, other-than-human, inhuman" (Haraway, 2015). That is the so-called waste of experience. To overcome it, one has to re-inquire into the past (and, thus, the present).

Therefore, when we advocate the need to historicize modern science, it is important to note that we are not dealing with any and all historical approaches. There are those approaches, for example, that can even contribute to further essentialize other ways of knowing, which is not what we seek. Rather we propose the (re)telling stories about the past in ways that render identifiable the power structures inscribed in those histories—that histories, and even histories of science, must be understood as fabricated narratives and not natural ones (Mignolo & Walsh, 2018). As Santos (2019) and Harding (2015) teach us, colonialism, capitalism, and patriarchy are among the main forms of structural inequality that drive contemporary society; therefore, identifying the various forms of colonialism and patriarchy, as well as the hybridizations between capitalism, colonialism, and science, is fundamental in providing us with tools to imagine other futures. Next, we share a case study related to the history of botany that helps to contextualize our argument.

Going Deeper: A Short Case in the History of Botany

Botanical activity developed in Europe had undergone a major change during the eighteenth century when, in the early part of that century, botany began to acquire a strong economic character, prior to focusing on the pharmaceutical function of plants (Sigrest & Widmer, 2011). In this context, the colonizers invested in obtaining natural products from colonies to compete with trade monopolies maintained by other nations (Bravo, 2005). This change in botany increased the demand (and, consequently, the flow) for specimens from the colonies, encouraging the practice of European expeditions to colonies. Spain, for instance, supported expeditions to America and the Philippines to collect,

describe, and identify new plants, subsequently publishing these findings and commercializing these natural commodities (Bleichmar, 2011).

The expeditions from Europe to the colonies, with both commercial and taxonomic goals (Bravo, 2005), had the function to locate American plants with potential for commercialization, such as American varieties of cinnamon, tea, pepper, nutmeg, and others. In these expeditions, scientific practices such as the collection and pressing of plants, illustrations, notes on observations of the places where the plants were collected, the transport of plants, activities aimed at adapting them far from their place of origin, and others, were widely developed and mobilized different social actors (Sigrist & Widmer, 2011).

These state-sponsored expeditions were considered an opportunity for young European men to join the scientific *milieu*. Those who wished to accompany these expeditions were trained to be able to take the plants they were looking for to Europe. Thus, in different locations there were book publications, such as the one published in Spain and entitled, in a free translation, "Instruction on the safest and most economical way to transport live plants by sea and land to the most distant countries" (Gómez Ortega, 1779), whose author was a member of the Botanical Society of Florence and of the Royal Medical Academy of Madrid. These publications served as professional conduct manuals for young travelers, in order to reduce the loss of collected specimens, and to train these men as "reliable witnesses" since the observations made by them in colonies could not be verified by botanists in Europe (Livingstone, 2003). The expeditions enlisted naturalists, physicians, clergymen, surgeons, imperial and colonial administrators, and artists. Training the eighteenth-century botanist became a global project (Bleichmar, 2011).

Part of this endeavor, the illustration practices, which were pivotal for the development of botany at that time, enlisted plant collectors, botanists, and also artists (Bleichmar, 2011). To get an idea of the importance of this process, Carl Linnaeus (1707–1778), who published a classification system that stands out in this context, received from only one expedition 250 herbarium specimens between 1767 and 1778, and two sizable collections of images produced in the colonies (Bleichmar, 2011). About the work of the artists, one can say that they were not free to represent the plants any way they saw fit. They were carefully trained to produce a version of the plants that was fitting for taxonomic description (Daston & Galison, 2007), ensuring that a plant collected in the colonies could be identified within a classification system used for the study of plants in Europe (Bleichmar, 2011). Thus, while the collected plants were recognized as something familiar, the identification of something hitherto unknown within the system strengthened the premise that the knowledge produced in this process was truly "universal."

In this context, atlases of botany played a central role in the dissemination of the knowledge of botany produced by Europeans in colonies and in Europe (Daston & Galison, 2007). The botanists who participated in the production of plant illustrations guided the hired illustrators so that they represented what the botanists thought that need to be represented (Daston & Galison, 2007).

In this process, the differences between the leaves and flowers of the same plant were not portrayed. In the search for order and regularity, Linnaeus' classification system was built based on "plant sexuality," ordering the specimens in class and order (George, 2006). The number or proportion of male and female parts of each flower, called stamens and pistils, distinguished the classes and the orders. Thus, we find parts of the plants registered in the atlas' images that allow the identification of stamens and pistils (George, 2006). The names of the species and genus who were considered to be named received a Latin name derived from the name of the person who first described the species in publication. In this process, the artists and many other social actors who participated in the botanical processes were made invisible.

Sixteenth-century Europeans came to the Americas and learned about medicine and edible plants unknown in Europe, and they shared this knowledge in the European continent. Physicians and naturalists who never came to America used this knowledge to improve medicine and botany (Bleichmar, 2005), even though Europeans simultaneously disregarded knowledge from the Americas as less sophisticated (Harding, 2015). As Schiebinger (2005, p. 144) argues, "European colonial expansion depended on and fueled the search for new knowledge concerning tropical medicines. At the same time, colonialism bred dynamics of conquest and exploitation that impeded the development of this knowledge." Local knowledge was not only invisible in the illustrations and botany publications, in fact, the value of local knowledge was also disregarded. José Celestino Mutis (1732–1808), a Spanish botanist who lived in Colombia for twenty-five years and whose name was used by Linnaeus to name a specimen, drew much knowledge (which he published) from conversations that he had with local people from various social and ethnic groups. In these conversations, he asked local people about the local knowledge of flora and their medicinal use. He recorded and used these responses in his research while also denigrating local knowledge (Bleichmar, 2011). In 1686, Fontenelle (1686/1993) wrote a book to disseminate the Copernican system and astronomy knowledge to European women. In his book, that had several editions translated to many languages, Fontenelle also denigrated American Indians' knowledge and ways of life. To summarize, a powerful knowledge about plants taken from the colonies was developed, and, at the same time, powerful knowledges and ways of thinking about the same plants and the environment were marginalized, or, in Santos' (2002) words, were "wasted." In Europe and in sites where cultural knowledge appropriation occurred, such as the United States, however, only some stories, perhaps even a single story, about this knowledge construction are taught. If we intend to seek strong answers to the questions that the Anthropocene imposes in contemporary times, it is necessary to recognize these colonial erasures and consider that the neglected knowledge, the "wasted" epistemes, could have built paths to support answers to our current urgent questions. Societies' visions about the HoS are shaped by these hegemonic stories that frequently neglect processes of pillage and erasures that were foisted on native people of

the colonies. When these stories are not told, the mythic ideals as to the universality of WMS are reinforced, and one extends the cycle of "wasting" other possible ways of living on the earth.[4] This process of unveiling other stories that can be told about science in schools, we argue, can benefit Anthropocene discussions. In the next section we are going to explore how historicizing the Anthropocene is a way of telling other stories about sciences, and, thus, how it has great potential for reshaping some conversations inside Science Education research and practices.

When Anthropocene and History of Science Meet: Some Insights for Science Education

"Este mundo de mierda está embarazado de otro [...]"[5]
—Eduardo Galeano

The idea of historicizing the concept of Anthropocene is not something only we uphold. Moore (2017) also joins this criticism, who argues that the term "Anthropocene" itself disguises the real story behind how we got to the present moment. Moore (2017) claims that a more appropriate term would be Capitalocene, which would decentralize Man (*Anthropos*) from history, and bring attention to the role of capitalism in our current dire circumstances. According to Moore, during the rise of capitalism, the expulsion of many humans of their homes and from humanity (mainly women, people of color, Indigenous people) provided a material condition for seeing nature as external (Moore, 2017). Haraway (2016) also criticizes the story behind the concept of Anthropocene, which does not make clear the process of looting and plunder involved before the Industrial Revolution, which some advocate is a milestone of the beginning of the Anthropocene:

> One must surely tell of the networks of sugar, precious metals, plantations, indigenous genocides, and slavery, with their labor innovations and relocations and recompositions of critters and things sweeping up both human and nonhuman workers of all kinds. The infectious industrial revolution of England mattered hugely, but it is only one player in planet-transforming, historically situated, new-enough, worlding relations. The relocation of peoples, plants, and animals; the leveling of vast forests; and the violent mining of metals preceded the steam engine; but that is not a warrant for wringing one's hands about the perfidy of the Anthropos, or of Species Man, or of Man the Hunter.

[4] Here we use the words of Ailton Krenak, an indigenous leader that confront the idea of nature and the world, at large, as a place we live in. As Krenak puts it, the indigenous people are the forest itself and not just "live" there. In our vision, the same goes for all the humans and the earth.

[5] Spanish for "This shitty world is pregnant with another world.".

It is this critical view of history that we share, and these are the other stories that we seek to tell about what happened in the past. The stories we tell about the past are not dissociated or dissociable from our present or from our perspectives for the future. As Chakrabarty (2018) puts it, the Anthropocene has challenged us in the sense that if once we constructed our histories about the past with a more or less secure prospect of the human existence in the future, now it is not the case anymore. So, this retelling of the past is not (only) a matter of justice for those who were erased from the dominant histories, but an active and imaginative process of reinvention of this past which could allow us to take care of the present (Haraway, 2015) to move forward and make our existence on this planet possible in the future. We argued, in another work, that the sociology of absences, proposed by Santos (2002) would help in the task of seeing the waste of experience in the past-present, identifying the absences in history and in the present time. We believe, along with the sociology of absences, that the sociology of emergencies (Santos, 2002) can help us to imagine possible futures from the recovery of the past and the present. According to Santos:

> Here, too, the point is to investigate an absence, but while in the sociology of absences what is actively produced as nonexistent is available here and now, albeit silenced, marginalized, or disqualified, in the sociology of emergences the absence is an absence of a future possibility as yet not identified and of a capacity not yet fully formed to carry it out. This is a prospective inquiry operating according to two procedures: to render less partial our knowledge of the conditions of the possible and to render less partial the conditions of the possible. (2002, p. 258)

What are the consequences of this reconceptualization for science education with a historical approach that tells another story about the relationship between modern science, capitalism, and colonialism? To think about this issue, it is important to highlight our standpoint, in order to try to make it clearer why we say what we say, as Chimamanda Adichie teaches us. As woman and man from Brazil, who work primarily in the field of science education, and, perhaps by living in Brazil of 2020 we probably feel more heavily the consequences of social inequalities, climate change, and the rise of political authoritarianism, we consider science classes as a space for social struggle. Therefore, we consider it as a place for the construction of ideas and possibilities for responding to contemporary dilemmas. As science teachers, we believe that the HoS emerges as a possibility to recognize that science education has a fundamental role to play in questioning the exclusivity of WMS. Indeed, "there is no knowledge without practices and social actors" (Santos & Meneses, 2009).

There is a long tradition of research in science education that presupposes that it is essential to promote the study of the nature of science (NOS). Although we recognize the potential of such initiatives in promoting debates

about sciences, we consider that, because they do not explicitly consider that WMS was built and consolidated in the light of the triad of patriarchy, colonialism, and capitalism, they do not problematize the concealment, violence, and appropriation processes that occurred in the establishment of WMS. Consequently, the universalism intended by modern science appears as something given and natural rather than as a premise that, in order to be valid, it committed erasures throughout the process of development of scientific knowledge. In this way, the potential of science education to be a space for social struggle, a space for the development of ideas and possibilities for responding to contemporary dilemmas, is also wasted.

We find possibilities within the premises behind HPSS in science teaching:

> [I]t can humanise the sciences and make them more connected with personal, ethical, cultural, and political concerns; it can make classrooms more challenging and thoughtful and thus enhance critical thinking skills; it can contribute to the fuller understanding of scientific subject matter—it can contribute a little to overcoming the "sea of meaninglessness" which one commentator said has engulfed science classrooms, where formula and equations are recited but few people know what they mean; it can improve teacher training by assisting the development of a richer and more authentic epistemology of science, that is a greater understanding of the structure of science, and its place in the intellectual scheme of things. (Matthews, 1992)

Given the current state of affairs and our situation as an endangered species, perhaps it is time to revisit some of these purposes. In the first place, we think that revisiting the HoS such as that we have presented takes us on the path not of humanizing science, but of seeing it as an enterprise that has a certain look at Nature and at the human–nature relationship that is not unique and absolute. This may go beyond humanizing the sciences, in the same sense that understanding our "era" as Capitalocene instead of Anthropocene also does. About thoughtful and challenging classrooms, we certainly cling to this objective. As Harding (2015) points out, the vision that WMS is a science from nowhere should be denied; all sciences are politicized. This concept is still incipient in HPSS & SE research field.

Recalling Santos (2008), our need may not be the refusal of WMS but its reconfiguration "in a broader constellation of knowledge where it coexists with practices of non-scientific knowledge that survived the epistemicide [...] whether or not they have a non-capitalist horizon as reference" (p. 156). We understand that our (urgent) task is to look for ways to retell our stories, having a clear political commitment to the present and the future. Whether in WMS, or in science education itself, we need to reexamine how stories are told, who tells them, when they tell them, and what the power structures underlying these stories are. What could it mean for science education research and practice? Firstly, it is important to remember, as Paulo Freire (1987) states, that there is no education in a political vacuum. The same goes for science education. One important but the overlooked dimension of using HoS in

science education is seeking to understand the erasures in our understanding of history. This is a complex reconstruction that will take a time long to be accomplished by historians of science in ways that begin to effectively challenge dominant stories. But, as science teachers, we can seek to unveil the erasures in each history, and maintain a critical awareness of the role of capitalism, colonialism, and patriarchy in History and, thus, in HoS, opening up possibilities of thinking-acting in the present to build different futures. This can help to bring back wasted epistemes to the game of knowledge, reinventing our *histórias*.[6]

To reinvent the future, we need to reinvent the past, which is a task that we should not fear. If we live today, in a *mundo de mierda*, we must remember that it is pregnant with another world—as Galeano teaches us. It is urgent that, following Paulo Freire, we roll up our sleeves to *esperançar*[7] this new world. If there is a certainty in studying HoS, it is that the world has changed a lot throughout history, so that another world is possible. We invite the reader to *esperançar* the world—or the world after the end of the world—together.

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[6] In Portuguese, the word "histórias" may refer both to History (the hegemonic History with capital H) and stories (the stories we can tell about anything). So, we opted to use "histórias" here to highlight this twofold meaning and also to highlight how different rationales (sometimes expressed by language) can help us to think differently.

[7] *Esperançar* (pronounced is.pe.ran.'sar) is a Portuguese verb, stemming from Paulo Freire's thought, derived from *esperança* (hope) that differs from "being hopeful" because instead of meaning to be in a waiting state, *Esperançar* does not mean to conform, but to pursue and fight for goals.

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