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Dualism and Anti-Dualism in the Anthropocene: Process Sociology and Human/Nature Relations in the Great Evolution

André Saramago *

Abstract: »Dualismus und Antidualismus im Anthropozän: Prozesssoziologie und Mensch/Natur-Beziehungen in der Großen Evolution«. The contemporary ecological crisis challenges the human sciences to develop analytical frameworks that do not treat “nature” as simply the background of human activity. In this context, there are numerous calls for an abandonment of the “anthropocentrism” that colours most approaches to the human sciences, along with the dualism these establish between “nature” and “humanity,” and their substitution with more “ecocentric” perspectives. This article is a contribution to this ongoing debate. With reference to a process sociological understanding of human/nature relations, it proposes a theoretical avenue to overcome anthropocentric dualism via the process sociological conception of “levels of integration” in the “great evolution” of the planet, while making the case for the need to preserve a theoretically relevant awareness of the evolutionarily emergent distinguishing characteristics of the human species. Without an understanding of these emergent characteristics, and the developmental paths these have opened in the history of the species and the planet, neither the origins nor the adequacy of the answers to the ecological crisis can be properly understood.

Keywords: Process sociology, Anthropocene, levels of integration, triad of controls, involvement-detachment balance, ecological regimes, intensive and extensive growth.

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1. Introduction

In recent years, the accumulating evidence of anthropogenic climate change and ecological degradation (see Gaffney and Steffen 2017; IPBES 2019; IPCC 2018) has led to proposals for the definition of a new geological epoch, the Anthropocene, a concept that seeks to capture the extent to which human beings have become a major shaping force of the Earth's ecological systems (Crutzen 2002). The official establishment of the proposed new geological epoch is still under assessment by the International Commission on Stratigraphy, and there is still an ongoing discussion concerning the most adequate periodization of the Anthropocene (Subramanian 2019), but the term highlights the extent to which human beings have come to shape life on Earth. The realization of the damaging impacts of human activity on the planet's ecosystems, the most, but not exclusive, visible manifestations of which are anthropogenic climate change and biodiversity loss (see Pereira and Viola 2018; Ceballos, Ehrlich, and Dirzo 2017), has led to growing calls, within the human sciences, for the need to abandon predominantly "anthropocentric" perspectives and their associated "dualistic" conception of human/nature relations, which treat nature only as a background to human activity (e.g., Cudworth and Hobden 2018; Eckersley 2017; Dryzek and Pickering 2018; Pereira and Saramago 2020).

This article provides a process sociological perspective to this ongoing debate. The argument is made that, while indeed an overcoming of the ontological dualism between that which is "human" and that which is "nature" is fundamental under conditions of rapid ecological deterioration, at the same time, most recent proposals seeking to escape the "anthropocentrism" predominant in the human sciences also tend to efface important distinctions between human beings and the rest of nature. Without an understanding of these differences, it is argued, neither the origins nor the adequacy of the answers to the Anthropocene can be properly understood. The article thus proposes a theoretical framework that, simultaneously, provides an avenue to overcome ontological dualism, while making the case for a developmental-emergentist conception of human/nature relations that preserves an awareness of the evolutionarily emergent distinguishing characteristics of the human species. An understanding of these characteristics, and of the paths of development these have opened in the long-term process of evolution of life on the planet, is fundamental for a more adequate comprehension of the processes that led to the current ecological challenges, but also for a more adequate orientation concerning how human beings might learn to live in more ecologically-sound ways.

The argument is developed in three steps. The first section provides an overview of the ongoing discussion between dualist and anti-dualist

perspectives in the human sciences and makes the argument for need to overcome dualism while conceiving of human/nature relations in a way that preserves a theoretically relevant awareness of the evolutionarily emergent distinguishing characteristics of human beings vis-à-vis the rest of life on the planet. The second section mobilizes concepts from process sociology, such as “levels of integration,” to discuss how this sociological approach provides a developmental-emergentist theoretical framework capable of framing human beings in the long-term process of evolution on the planet. A framework that overcomes anthropocentric dualism but does not lose sight of the emergent characteristics of the human species and their meaning for a more adequate understanding of the Anthropocene. Finally, section three discusses how process sociology’s conceptual apparatus, namely with reference to concepts such as “triad of controls,” “ecological regimes,” or “involvement-detachment balance,” can be mobilized to improve the analytical and theoretical frameworks on the basis of which human beings might better orientate themselves in understanding the current ecological predicament they and the rest of the Earthly species face. An improvement of the human “means of orientation” in the Anthropocene, it is argued, is fundamental if humans are to be capable of identifying and devising the required learning processes via which they might develop more sustainable patterns of human/nature relations.

2. Dualist and Anti-Dualist Perspectives of Human / Nature Relations

The experience of the effects of climate change and ecological degradation has been accompanied, within the human sciences, by a growing questioning of what has come to be understood as the unacceptable divide between humanity and nature that is supposedly at the core of modern Western thinking and worldviews (e.g., Haraway 1992; Plumwood 1993, 2005; Dryzek 2005, Ch. 3). This split between that which is “human” and that which is “natural” is identified in some literature as structural to the thought of key Enlightenment figures, being expressed, for example, in Descartes’ characterisation of non-human animals as machines distinguishable from humans capable of thought, or Immanuel Kant’s distinction between the phenomenal and the noumenal worlds, with the former consisting of the realm of heteronomy determined by empirical causal laws, while the latter being the realm of autonomy led by the noumenal laws of pure reason. Kant (2002, 2006) places non-human nature squarely in the phenomenal realm, while describing humans, in their condition of rational animals, as existing between the two realms. In other words, unlike non-human species, humans have a capacity for not only

autonomy, in so far as their behaviour is determined by pure reason rather than their animalistic impulses, but also to rationally understand the empirical causal laws of the phenomenal realm and hence come to dominate over non-human nature (Moyer 2001). The worldview inaugurated with the Enlightenment is thus charged as guilty of a fundamental anthropocentrism, seeing nature as simply the background condition for the expression of human autonomous activity, an inert matter waiting for human manipulation and control.

The conception that human/nature dualism lies at the core of contemporary ecological problems has mobilized an anti-dualism movement within the human sciences that seeks to develop an ecocentric worldview which sees humans as inherently a part of nature while recognizing autonomous agency to the non-human part of the universe. Exactly what form that anti-dualist perspective should assume has been a topic of great contestation. Proposals range from an embrace of non-Western perspectives supposedly untainted by anthropocentrism and expressed in concepts such as *buen vivir* or *Pachamama* (Schoukens 2020; Villalba 2013) to calls for the development of “planetary politics” (Burke et al. 2016) or “interspecies politics” (Youatt 2020) as substitutes for mainstream Enlightenment political orientations.

An approach that has mobilized significant support is Bruno Latour’s actor-network theory (ANT), which offers a relational conception of human/nature relations in which there is no distinction between human and non-human actors, or even between living beings and non-living objects, by arguing that all interactors in a relational network are mutually constituted by their relations with each other (Latour 2005, 2018). From such a perspective, there is no fundamental difference between human beings, non-human species, inorganic nature, and human-made objects, as all act upon each other in complex relational networks outside of which they do not exist as isolated elements. ANT has thus been frequently portrayed as an “attempt to erode, or at least bypass the barriers between the natural and the social arena” (Newton 2007, 28). In some sectors, it has come to be understood as a fundamental break with Enlightenment dualism, substituting its anthropocentrism with a non-dualist relational conception of human/nature relations which, to some authors, opens the way for a relational conception of the universe and human beings’ place in it (e.g., Kurki 2020; Trexler 2013; Pellizzoni 2016; Carter and Harris 2020; Bennett 2010).

However, the anti-dualist approach provided by ANT has also been the target of significant contestation. It has been argued that by collapsing the difference between the human and the non-human, ANT effaces important differences that are essential to orientate human thought and action, especially under conditions of global climate change and ecological degradation. In perhaps one of the harshest critiques of ANT-inspired sociological writing on human/nature relations, Andreas Malm (2020) has argued that, if taken to its

logical conclusions, the erasure of the distinction between the human and the non-human leads to untenable perspectives. For example, referencing Timothy LeCain's (2015) neo-materialist ANT-inspired arguments, Malm (2020, 93) observes how, from an ANT perspective, unintended consequences of intentional human actions become understood as an expression of non-human agency in a way whose "tacit postulate [...] is that intentional human agency terminates at the point where unintended consequences materialise." This perspective leads LeCain (2015, cited in Malm 2020, 93) to argue that, since humans did not set out to cause the global geochemical changes associated with climate change, and these are largely unanticipated and unintended consequences of their actions, namely the burning of coal, "then [to] conclude that humans alone are responsible for the course of events that resulted from burning coal [is] nonsense." According to Malm (2020, 93), this equivalence between the unintended consequences of human actions and non-human agency ultimately leads to the conclusion that fossil fuels, such as oil and coal, are as much "agents" in the release of CO₂ into the atmosphere as are fossil fuel companies and their CEOs since, from an ANT perspective, all are part of a relational network constituting the phenomenon of climate change (Malm 2020, 93). Such a conclusion, Malm (2020, 111) argues, has pernicious political consequences, as it allows those humans who are the main agents behind the extraction and burning of fossil fuels to share responsibility for the effects of their activities with inorganic components.

The critique of ANT has been widened into a broader critique of the anti-dualist movement in the human sciences, with the argument that the focus on the dilution of the Enlightenment barrier between humans and nature has tended to occlude fundamental differences between human beings and the rest of nature that must be retained so that a proper understanding can be developed of the processes underlying not only climate change, but also the possibility of avoiding a sixth mass extinction event on the planet. Alf Hornborg (2009, 2017a, 2017b), for example, has made the argument that a recognition of the condition of humans as a part of nature should not completely efface fundamental differences between humans and the rest of nature. Without a recognition of such differences, Hornborg (2017b) argues, it is impossible to understand the key role humans have played in the processes of ecological change being experienced. In this context, Hornborg (2001, 126) highlights how human beings are the only known species on the planet to have evolved forms of communication via symbols rather than purely via signs. Symbols are defined as "signs that relate only by convention to the objects to which they refer" and constitute a form of "linguistic signs" that are exclusive to humans, existing in parallel with a plethora of pre-linguistic "sensory signs" (visual, auditory, tactile, olfactory, taste) that both humans and other species make use of. Providing the example of Amahuaca hunters in Peru, who have learned not only to acquire information from animal

sounds, excrements, or tracks, but can also “disguise their own colour and scent and imitate animal cries to get the animals to respond,” Hornborg notes (2001, 126) that throughout millennia, the interaction between humans and non-human nature has been mediated by both pre-linguistic sensory signs and symbolic linguistic signs. “Traditional ecological knowledge” thus has both a linguistic and non-linguistic component on the basis of which humans have learned to orientate themselves in their living environment (Hornborg 2001, 129).

While non-linguistic sign communication, which humans share with other animal species, is locked to specific moments in time and space, symbolic communication, an evolved characteristic of human beings, by being based on human intra-group linguistically agreed-upon conventions, permits human beings to escape time and space constraints through the development of a symbolic and linguistic culture that serves as an inter-generational repository of knowledge on the basis of which people learn to orientate themselves in their relations with each other and with non-human nature. Symbolically-mediated communication, by permitting the inter-generational accumulation, transmission, and adaptation of behaviour on a basis other than the much slower process of biological evolution, has provided human beings with a clear evolutionary advantage vis-à-vis other earthly species in terms of ensuring its own survival, proliferation, and occupation of almost all ecological niches of the planet (see Elias 2011 [1991]). Without recognizing the fundamental evolutionary breakthrough represented by symbolically-mediated forms of communication and behaviour, and the way it has qualitatively changed human agential capacity within the ecological networks of which humans are a part, the social and evolutionary processes underlying either the global ecological impact of human activity or the possibility of ameliorating its more negative effects for the sustainability of life of Earth cannot be adequately understood (Hornborg 2017b).

There is thus a case for the development of a perspective which, while seeking to overcome the anthropocentric dualism that has coloured most approaches within the human sciences to human/nature relations, retains the capacity to identify, in theoretically relevant ways, the distinguishing characteristics of human beings vis-à-vis the rest of nature. Such a perspective is fundamental to both reconstruct the processes leading to contemporary ecological breakdown and to understand potential future paths of development that might ameliorate its worst impacts on human and non-human life on the planet. The argument of the next section is that the first steps towards such a perspective can be found in Norbert Elias’s process sociological conceptualisation of human/non-human nature relations.

3. Levels of Integration in “the Great Evolution”

Process sociology has been described by Stephen Quilley and Steven Loyal (2005) as a potential “central theory” for the human sciences. It is one of the few sociological approaches to have fully integrated and built upon developments in the biological sciences, such as the great synthesis between Darwinian evolution and Mendelian genetics. This basis in the natural sciences, Quilley and Loyal (2005) argue, has permitted Elias to develop an approach to the study of human social development that avoids establishing a dualism between humans and nature but maintains a capacity to identify the distinguishing features between physical, biological, and social processes that have emerged throughout the process of evolution of the Earth and of the universe itself. Elias’s sociological theory is thus framed in a wider conceptualisation of human/nature relations that integrates insights from evolutionary biology and mobilises them in ways that are highly relevant for the present discussion.

Despite Elias’s tendency to seldomly acknowledge the main references behind his thought, recent research has made the argument that Elias’s discussion on the sociology of knowledge and the sciences is infused with what at the time was the emerging consensus within the organicist movement in biology, namely in the work of authors such as Julian Huxley or Joseph Needham, concerning the place of human beings in the long-term process of evolution of the planet, and even of the cosmos, and the implications of those insights for the relation between the various natural and human sciences (Quilley 2010, 392). In this context, Elias (2007a, 185-91) suggests the notion of “levels of integration” within the “great evolution,” referring to the non-planned and non-teleological development of higher levels of complexity and organization, with emergent characteristics at each of those levels, throughout the long-term history of the cosmos. At each of these levels, more complex patterns of organization of the elements of the lower levels give rise to emergent characteristics that cannot be subsumed to a mere sum of the characteristics of the lower levels and that increase the capacity of the higher levels to influence the lower ones. Elias (2007a, 195) identifies three main levels of integration that have hitherto emerged throughout the long-term process of development of the cosmos: the physical, the biological, and the symbolic. At each of these levels, particular patterns of organization, developing in a non-planned manner, give rise to higher levels of complexity and emergent characteristics that inaugurate the emergence of new levels of integration in the cosmos.

Hence, the organization of simple molecules gave rise to the first prokaryotic simple cells with a capacity for metabolism, i.e., a capacity to take elements from their environment to generate internal energy, repair

themselves, and self-replicate. The emergence of life gave rise to a new level of integration, that of biology, whose characteristics could not be subsumed to those of the inorganic elements at a lower level of integration whose combination gave rise to biological life. At the same time, organic life quickly revealed a capacity to affect and transform the inorganic level of integration, as the emergence of photosynthetic cyanobacteria led to the transformation of the atmosphere of the planet into an oxygen-rich environment, simultaneously opening new pathways for the evolution of life (Elias 2007a, 191). Similarly, the long-term process of biological evolution on Earth gave rise to anatomically modern humans, members of a species displaying several biological characteristics, such as bipedalism, opposable thumbs, or a lowered larynx, that permitted a greater degree of flexibility in their vocalisations and capacity for object manipulation when compared to other animal species (Elias 2011 [1991], 52). These evolved biological features opened the way for the exponential development of tools as a means of manipulation and transformation of human beings' natural environment to satisfy their needs and for the development of linguistic symbolic communication, a process which Elias describes as "symbol emancipation."

In this context, Tim Newton (2007, 109) notes that perhaps "technolinguistic" emancipation might be a more adequate term, as it captures the fundamental interplay of tool-making and symbolic-communication in human development. The concept adopted in the rest of this article to describe this level of integration, "technosymbolic," follows Newton's insight and will be a topic of further discussion in future research. For current purposes, it is enough to note how the more complex organization of biological elements led to the emergence of new characteristics, namely to symbolically-mediated inter-human communication and to technology-mediated metabolism between human beings and their environment, which cannot be reduced to a mere summatory of the biological elements that gave rise to them.

Technosymbolic emancipation thus inaugurated a new level of integration with dramatic consequences for both human beings and the rest of life on the planet. It shifted the balance between genetically oriented and symbolically oriented behaviour in human beings, with the later becoming the main pace-maker of human development (Elias 2011 [1991], 56).

In this context, Newton (2007, 159) has also noted that in Elias's work the distinction between the predominance of genetically oriented behaviour among non-human animals and symbolically oriented behaviour among humans still appears at times too sharp given contemporary knowledge about non-human group-specific behaviour. For example, chimpanzees have been observed to make warning shouts for the presence of a threat, such as a snake, which vary across different groups. Similarly, techniques of tool making (to hunt for termites or break nut shells, for example), which are passed on inter-generationally through mimicked behaviour, have also been

observed in some groups of chimpanzees and not in others (see de Waal 2002). However, this observation does not take away the important distinction to be made between pre-linguistic signs and linguistic symbols that was mentioned above (Hornborg 2001). While sign-oriented behaviour can exhibit some degree of local and inter-group variability, something which is observed across different species, signs are still predominantly locked to specific time and space manifestations and can only refer to events in the present. Hence, an older chimpanzee must enact the tool-making behaviour as a way to pass on that knowledge to younger members of the group. That knowledge is not symbolically codified in such a way that it can be transmitted later, referring to events/behaviours that are not being re-enacted in that moment. Similarly, alarm shouts are also locked to specific moments and cannot be taught via the symbolic reference to events outside the actual presence of the threat they refer to. The development of symbols communicated both orally and, later, in written form, has thus permitted human beings to evolve a significantly higher degree of flexibility in behavioural patterns, becoming capable of referring to events and objects outside the immediate experience of the communicators. This has greatly expanded the possible stock of accumulated knowledge of the human species, a development further reinforced by the invention of writing, permitting human beings to constantly build upon their social stock of knowledge concerning non-human nature and how best to manipulate and transform it to fulfil their needs.

Hence, just as the emergence of biological life implied its capacity to transform the lower level of physical integration on the planet – with known examples of animal species changing the shape of landscapes over the long-term (see, e.g., Youatt 2020, Ch. 4; Ausilio et al. 2021) – the emergence of symbolically oriented behaviour in human beings opened the way for an evolutionary advantage that has permitted humans to use and transform other animal species and natural landscapes in ways suitable to their own ends. The technosymbolic level of integration has thus become increasingly influential in the evolution of the biological and physical levels of integration of the planet. Again, this relation is not one-sided, as lower levels of integration also retain the capacity to influence, drastically at times, higher levels of integration, as seen by the example of pandemics and their effects on human societies. However, the technosymbolic level of integration also opens the way for learning processes on how to respond to such influences from lower levels, as the development of the medical sciences demonstrates.

Furthermore, according to Elias (2011 [1991], 47), technosymbolic emancipation is what explains the high degree of variability that can be observed in the human species – both spatially, between human groups, and temporally, across relatively short periods of time – when compared with that witnessed in non-human species. The latter tend to not exhibit significant differences between groups of the same species, and major behavioural changes tend to

be accompanied by biological evolutionary transformations. Human beings, by comparison, exhibit a high degree of changeability within the same biological species. Different human groups show a high variety of behavioural patterns, while also frequently manifesting radical transformations in their patterns of social organization without undergoing biological evolution (Elias 2011 [1991], 47).

Elias's non-reductionist developmental-emergentist conception thus provides a worldview that overcomes the anthropocentric dualism between nature and humanity that characterises a tradition of thought arising with the Enlightenment (Gare 2014), while avoiding the effacement of some important differences between human beings and non-human nature that has become so prevalent in recent anti-dualist ontologies. Elias thus maintains a form of ontological monism in his understanding of human/nature relations combined with a focus on the distinguishable and non-reducible emergent features characterising each level of integration in the long-term process of evolution of the cosmos and planet Earth. From this perspective, there is no dualism between humans and nature, or between biological life and inorganic nature. Rather, nature comes to be understood as an emergent, self-organizing developmental process of which humans, and the symbolic and technological dimensions of reality that have emerged with them, are a part. At the same time, the human species also exhibits characteristics, such as symbolic emancipation and a capacity for technological development, that have permitted human beings to acquire a degree of influence over the biological and inorganic parts of planet Earth that surpasses that of other species on the planet. Humans have explored that higher capacity to shape their living environment in ways that improved their survival chances and capacity to proliferate, occupy, and exploit, for their own benefit, almost all relevant ecological niches on the planet, with dramatic consequences for other species.

But technosymbolic emancipation also opens the way for a potentially never-ending learning process. From that perspective, it is also possible that it provides the means via which humans might learn how to regulate their metabolism with nature in ways that are less disruptive of the ecological processes on which all life on the planet depends.

4. Improving the Human Means of Orientation in the Anthropocene

As mentioned above, human beings exhibit a significantly higher degree of behavioural flexibility than other species, which is related to the fact that their relations with each other and with non-human nature are mediated via

technology and symbolic communication. This technosymbolic mediation permits humans to significantly expand their stocks of symbolically codified knowledge about the human and non-human parts of the world in ways that are conducive to long-term, intergenerational processes of cumulative learning, on the basis of which humans improve their capacity to transform their social and natural environments with the purpose of improving their suitability for the satisfaction of human ends. However, as Elias (2011 [1991], 136) frequently draws attention to, human learning processes are also highly precarious, limited, and potentially misguided, with their learning-oriented interventions in both the social and the natural dimensions of their existence frequently leading to unintended harmful consequences both for them and other species.

Elias (2012a [1978, 1970], 151-2) seeks to capture the frequently contradictory character of human learning processes at the technosymbolic level of integration via his notion of the “triad of controls.” The argument is that all human societies, irrespective of the time and place where they exist, must develop some pattern of these three basic controls to ensure their survival and reproduction. All human societies must learn how to exercise control over non-human nature in order to transform it into the objects required for the satisfaction of human biological and social needs; all human societies must learn how to exercise some degree of collective control over social processes, namely via symbolically mediated social conventions regulating collective behaviour; and finally, all human individuals must learn some degree of self-control over their internal impulses and emotions so that these are in line with prevalent social conventions on which the continued existence of social life depends. The relation between these three types of control is synergic; as Elias (2012a [1978, 1970], 152) puts it, “the extension of control over nature is directly interdependent with changes in both self-control and in control over interpersonal relations.” However, the relation between these three types of control is not linear. For example, Elias (2012a [1978, 1970], 151) notes that, in modern societies, the degree of “control-chances over non-human nature nexuses” tends to be “greater and increase faster than [...] control-chances over interpersonal social nexuses.”

The patterns of the triad of controls are also highly changeable across space and time between different societies. Furthermore, these patterns are always symbolically mediated, as it is through symbolic communication that prevalent patterns of the triad are socially defined and transmitted across generations. The triad of controls is thus described by Elias (2012a [1978, 1970], 99) as a concept that captures one of the “universals” of human development. It is what has been described elsewhere as a “process-concept” that refers not to a specific pattern of human social relations and relations with non-human nature, but rather a concept that captures an inescapable feature of the

human condition, which assumes very diverse forms in different contexts (Saramago 2022).

Elias's conceptualisation of the triad of controls was elaborated by Johan Goudsblom (see Goudsblom 1994 [1992], 10; Goudsblom, Jones, and Mennell 1996, 39; Goudsblom 2002a), who summarised collective learning processes in each of the dimensions of the triad as, respectively, entailing developments in technology (i.e., human collective control over non-human nature), developments in organization (i.e., human collective control over social processes), and developments in civilization (i.e., individual self-control) (Goudsblom 2002a, 27-8). Again, the notion of developments in technology, organization and civilization here does not entail a conception of linear progress, but rather the development of differing patterns of control that might exhibit higher or lower complexity and contribute more or less to the survival chances of the groups displaying those patterns. The triad of controls is thus a key aspect of Elias's work that can be read as being an orientating theme of his research. It can even be argued that, in many ways, much of Elias's work consists of empirically informed theorisations of the relation between the different dimensions of the triad of controls. Hence, his analysis of the European civilising process can be read as an analysis of how developments in technology and social organization, permitting the historical emergence of power centres, in the form of sovereign states, with greater control over larger populations and spaces, were deeply intertwined with developments at the level of human individual patterns of self-control, or what came to be described as "civilized" behaviour (Elias 2012b [1939]).

In the same manner, Elias's (2007b [1987]; 2011 [1991]) sociology of knowledge can be read as an analysis of how lower levels of control over either non-human nature or social processes might confront human beings with perceived threats – posed by other animal species or other human groups – that give rise to individual feelings of insecurity and fear. The frequently uncontrollable character of these feelings, and associated impulses to fight or flee, tend to colour individual and collective perceptions and symbolically mediated models of social and natural processes with what Elias calls more "involved" perspectives. Such perspectives are mainly focused on understanding what those uncontrolled processes might mean for the individual and his or her immediate social group. For example, two human groups confronting each other come to perceive the opposing group as being intent on their destruction because they are evil and sub-human. A response to such a situation of uncontrolled social tensions oriented by more "involved" perspectives sees war and the elimination of the enemy as the most reasonable course of action. However, war and violent conflict, given their always unpredictable outcomes, entail an even further loss of collective control over the social processes that the two groups collectively constitute. A more "detached" perspective might have drawn attention to the way in which

each of the opposing groups threatens the other by its behaviour, leading to feelings of insecurity and hence to the aggressive posturing. A response to such a situation oriented by more “detached” perspectives might highlight the desirability of the development of social conventions between the two groups that lower their mutual perceived threats and build a sense of trust between them, thus actually enabling the development of a higher degree of collective control over the social processes of which the two groups are a part (Elias 2011 [1991], 149; see also Elias 2010 [1985]). However, achieving a more “detached” perspective requires significant efforts at self-control on the part of individuals, as these have to contain the impulses that the initial feelings of fear caused by the opposing group might invoke within them.

A similar dynamic between involvement-detachment and security-threat balances can be witnessed in the relations between self-control and control over non-human nature in the context of human/nature relations. Elias (2007c, 105-78) provides an exemplary fictional story of fishermen caught in a tempest at sea where those that are overcome by feelings of panic become incapable of calming themselves enough to see the patterns of the storm and how lighter objects of their wrecking ship tend to remain afloat while larger sections of the ship are being sucked down by the maelstrom. Again, those fishermen oriented by more “involved” perspectives seek to avoid jumping into the water that poses the source of the threat and hang on to the bigger pieces of the ship, while the survivor in the story is capable of exercising the necessary degree of self-control to develop a more “detached” perspective of their predicament and identify how to navigate the storm by jumping into the water and hanging on to the smaller debris that remain afloat.

As Stephen Mennell (2003) has noted, a major underlying theme in all of Elias’s work is how to improve the human means of orientation, so that human beings might learn how to develop patterns of the triad of controls that might be more conducive to their survival and flourishing within the opportunities opened by the “great evolution.” Namely, Elias’s concern was with how human beings might come to develop more “detached” means of orientation in conceiving their relations with each other and non-human nature, so that they might orientate their behaviour in ways that allow them to acquire a greater degree of collective control over their conditions of existence and to “promote core interests without harming each other over and over again” (Linklater 2011, 36). In many ways, the whole of Elias’s work can be understood as an attempt to provide such more detached and adequate means of orientation.

In this context, it is interesting to ask whether it is possible to build upon Elias’s work in such a way that speaks directly to the challenges faced by human beings and other earthly species in the Anthropocene. Goudsblom (1994 [1992], 2002a) is again insightful in this regard with his notion of the “anthroposphere” and “ecological regimes.” Goudsblom (2003, 3-4) introduces the

notion of the “anthroposphere” to refer to “that part of the biosphere which is inhabited and influenced by humans. The most fundamental trend in human history has been the expansion of the anthroposphere within the biosphere – at first slow and almost imperceptible, later at an increasingly more rapid pace,” as humans’ evolutionary advantages have allowed them to colonize and transform an ever-growing part of the planet’s ecosystems. This expanding anthroposphere has been accompanied by the development of several “ecological regimes,” that describe the main patterns of the triad of controls regulating the human/nature metabolism. Goudsblom (1994 [1992]) identifies the development of the fire regime, when humans learned how to produce and control fire, as one of the main developments behind the shift in the balance of power between human beings and non-human species. Fire kept other animals away from human encampments, improved hunting techniques and opened the way for the cooking of food and better nutrition. The cumulative effects of these innovations characterised the beginning of a process of expansion of the anthroposphere.

The fire regime provided the necessary conditions for the development of later regimes, namely the agrarian regime when humans learned how to cultivate food and initiated a long-term process of artificial selection of fruits, vegetables, and animal species with great impact upon the planet’s biodiversity, and, since the middle of the 18th century, the industrial regime (Goudsblom 2002a). The large-scale burning of fossil fuels that characterizes this regime was responsible for a radical further expansion of the anthroposphere as manifested by the release of greenhouse gases to the atmosphere, the accelerated growth of the human population, the occupation and transformation of an ever-expanding area of habitats by humans, and the development of synthetic products, such as plastics (Goudsblom 2002b). As Goudsblom (2002a, 42) notes,

industrialization meant the rise and spread of a third socio-ecological regime – the industrial regime, following the fire regime and the agrarian regime. [But] it did not put an end to the older regimes. On the contrary, new applications of fire lay at the very heart of industrialisation [...] while factories started generating means of production for agriculture [...] [from] combustion-driven machines [to] fertilizers and pesticides. By the end of the 20th century, agriculture and industry in many parts of the world had become inseparable and often even barely distinguishable.

The industrial regime was thus conditional to the so-called Great Acceleration (McNeill and Engelke 2014), when human transformation and disruption of the earthly ecosystems witnessed a dramatic quantitative and qualitative increase. In Eliasian fashion, Goudsblom (2002a) describes the development of the various ecological regimes as part of a long-term learning process in which humans came to develop different patterns of the triad of controls – with high variation between different human societies – that permitted them to explore their control chances over non-human nature in ways that seemed

immediately beneficial for human survival. However, these learning processes also exhibit a deeply contradictory and limited character. In many ways, the evolutionary success of human beings in ensuring their survival and proliferation through each of the successive regime patterns of the triad of controls has also come to undermine the conditions for the survival of both future complex human societies and many non-human species (see Quilley 2004, 2011).

From this perspective, the contemporary ecological crisis should be understood not in moral terms – as it sometimes tends to be discussed – but as a consequence of an unfinished learning process. Human means of orientation towards non-human nature and social processes, even though expressing higher levels of detachment than they might have done in the past, are still frequently coloured by forms of involvement that tend to see non-human nature in predominantly anthropocentric ways, from the perspective of its usefulness as a resource for the satisfaction of human needs. In this context, Goudsblom (2002c, 411-4) theorises the possibility of a “fourth ecological regime,” which would be the result of the development of a new pattern of the triad of controls embodying an even more detached perspective on human/nature relations. This perspective would “recognize the entire vital network of interdependencies in which human lives evolve – in other words, the dynamics of the anthroposphere within the biosphere” (Goudsblom 2002c, 414). This implies a conception of living nature as a self-organizing emergent process, of which human beings are an indissociable part. Similarly to Elias’s surviving fisherman caught in the maelstrom, the fourth ecological regime would be oriented towards understanding natural processual dynamics and how human beings can position themselves within those dynamics so as to ensure their own survival and flourishing while guaranteeing the sustainability of the natural processes on which all life on the planet depends. Control over nature under the fourth regime would thus assume less the form of domination and more the form of a “working-with,” similarly to the way the captain of a sailing ship navigates the sea and wind currents to take the ship to its destination. Control, under those conditions, means a detached understanding of the emergent natural processes in which the ship is embedded and a working with them towards human-established ends (see Saramago 2019, 215). A fourth ecological regime thus requires an overcoming of the ontological dualist conceptions of human/nature relations inherited from some Enlightenment traditions but, at the same time, it cannot rely on the effacement of the differences that exist between humans and the rest of nature, without an understanding of which the Anthropocene cannot be understood nor adequately navigated.

What concrete pattern of the triad of controls could assume in this hypothetical fourth ecological regime is an open question that Goudsblom has not engaged with in depth. Goudsblom (2002c, 411-4) comments in this regard

point to the technological search for new recycling methods and alternative energy sources, the organizational development of global forms of social regulation of the human metabolism with nature, and the development of new patterns of “civilized” individual behaviour that envision not only the reduction of harm in inter-human relations, but extend those concerns to non-human species and ecosystems, in what has been called elsewhere a form of “ecological civilising process” (see Quilley 2009, 2020; Rohloff 2019).

Other authors in process sociology have sought to address this question in a tentative manner, with a particular emphasis on the patterns of self-control that might be required and compatible with a more ecological orientation towards human/nature relations. Particularly interesting in this context has been the work of Stephen Quilley (e.g., 2004, 2011, 2013), namely his critical analysis of proposals that such a fourth ecological regime be characterised by a radical reduction of the anthroposphere, encapsulated in notions of “degrowth” that argue for the need to radically decrease the complexity of human societies, with proposals for a return to more sustainable forms of life, organized around small agricultural communities (see, e.g., Hickel 2021; Schmelzer, Vansintjan, and Vetter 2022; Odum and Odum 2001; Kallis 2011; Hopkins 2014). Quilley’s argument is that degrowth proposals often assume the possibility of returning to simpler and smaller societies while maintaining patterns of “civilized” conduct like those that became predominant in contemporary liberal democratic societies (for example, with respect to gender relations or care towards non-human animals). However, these proposals ignore the sociological conditions for such patterns of individual self-control. They ignore the extent to which the “civilized” patterns of behaviour of liberal societies are interdependent with the other two dimensions of the triad of controls, namely with the development of complex social mechanisms of regulation, pacification, and functional democratization of increasingly denser, lengthier, and intertwined networks of social interdependency, and with a significant level of control of non-human nature – even if in an unsustainable form – and associated taming of the threats posed by other species (Quilley 2011, 78).

It is thus unlikely that a drastic reduction in the complexity of human societies and in the networks of interdependence that characterise them would not also be accompanied by a reduction in collective control over social and natural processes. Under those conditions, liberal “civilized” patterns of self-control would be harder to maintain and in the long-term there would be a high probability that humans beings’ means of orientation vis-à-vis the social and natural processes in which they are embedded would also come to exhibit more involved perspectives, with what those entail both in relation to inter-human and inter-species relations. As Quilley (2011, 78) notes,

for those modern refuseniks disenchanted with the shallow, unsustainable idiocy of consumer society, there may well be cause to celebrate, with the

resurrection of family and community as the primary vehicles of social support and solidarity. [...] But there can no doubt that, with regard to the long march of political and social enfranchisement, such neo-traditionalism would be socially and politically regressive.

In Quilley's (2011, 78) view, "most anti-capitalist, anti-globalization and environmentalist prognoses of relocalization flatly refuse to engage with the implications of [their proposals for a] neo-traditionalist, post-liberal society."

However, according to Quilley (2011), from the perspective of process sociology, an alternative vision of what a fourth ecological regime could look like can also begin to be envisioned. Important in this regard is Goudsblom's (2002c, 403) distinction between "intensive growth" and "extensive growth" as the twin processes underlying the expansion of the anthroposphere. According to Goudsblom (2002c, 403), the expanding anthroposphere has been characterised both by extensive growth, i.e., the process via which human societies come to incorporate more and more of non-human nature into themselves and literally expand the space they occupy on the planet, and intensive growth, i.e., the process via which human societies improve their productivity by developing a greater capacity to collect and process information and mobilize energy and matter. Both extensive and intensive growth depend on the development of technology but are fundamentally intertwined with developments of collective social control and self-control. The relation between these two forms of growth is not linear, and in different moments in time and different societies one or the other can become prevalent.

From this perspective, Quilley (2009; 2011, 82) comes to argue that a fourth ecological regime could come to be based on a significant increase of intensive growth and reduction of extensive growth, in a process characterised as "trophic detachment." In this context, Quilley (2011, 82) comments on how the long-term process of human technosymbolic learning could lead to the development of the technological and organizational capacity to increasingly mobilize information, energy, and matter in ways that substantially reduce the impact of the anthroposphere on the biosphere. While he does not go into depth on what exactly that would entail, an example that is provided of trophic detachment is that of hydroponic farming. In that context, humans reproduce, under controlled conditions, the natural processes leading to the production of vegetables and fruits in ways that require a fraction of the amount of land and water, while producing more nutritious products and in greater abundance (see Verdoliva et al. 2021; for a more critical assessment, see Severson 2021). Hydroponic farming could thus be considered an example of an increase in intensive growth and reduction of extensive growth. It is a process that, simultaneously, increases human collective capacity to satisfy human needs while freeing space and resources for the regeneration of non-human nature. Furthermore, the social conditions for the reproduction of hydroponic farming, as an expression of human control over natural processes,

are intertwined with significant levels of social and self-control. Individuals participating in hydroponic farming practices require extensive education and understanding of complex technology and natural processes. Hence, intensive growth is premised on the increase of social complexity and on the development of a pattern of the triad of controls where human/nature relations come to be characterised by synergic, rather than dominating, dynamics.

Such arguments draw process sociology closer to recent proposals in the ecomodernist field (see Karlsson 2020; Symons 2019), while infusing them with much needed sociological insight that tempers their wilder expressions of techno-optimism. What exactly are the learning processes underlying the transition to a fourth ecological regime characterised by a reinforcement of a certain type of intensive growth and reduction of extensive growth remains an open question. One that process sociology can only answer if it also reinforces its understanding of the intertwined relations between the three dimensions of the triad of controls, particularly how technological development, as the means for regulating the human metabolism with nature, is intertwined with social control and self-control, a topic that remains to be further explored within process sociology. However, process sociology does offer a conceptual apparatus that can serve as a foundation for an improvement of the human means of orientation in the Anthropocene.

5. Conclusion

The Anthropocene confronts human beings and non-human species with a fundamental developmental challenge. If humans are to avoid the full experience of a sixth mass extinction event in the history of the planet, the initial effects of which are already being observed, development of more adequate theoretical and analytical frameworks based on which people might better orientate themselves in the current predicament is fundamental. In this context, inherited anthropocentric and dualist conceptions of human/nature relations, which continue to predominate in the human sciences, constitute a fundamental obstacle. But, at the same time, recent attempts to efface any form of distinction between “humanity” and “nature” can also easily become a source of disorientation. This article sought to provide an alternative perspective. Based on a process sociological approach that situates human beings and their distinguishing characteristics vis-à-vis the rest of nature in the long-term, non-teleological and emergent process of evolution on the planet, the article offered a framework that, it was argued, is capable of overcoming anthropocentric dualism, while retaining an awareness of the differences between humans and other species that is fundamental to understand the natural and social processes underlying the Anthropocene. Furthermore, an

effort was made to mobilize process sociological concepts to explore the implications of different answers to the ecological crisis. Further research is required. But process sociology can offer the foundation for the development of more adequate means of orientation that might help human beings learn how to navigate the Anthropocene in ways that ensure the survival, well-being, and potentially even the flourishing of both human and non-human life on the planet.

References

- Ausilio, Giorgia, Håkan Sand, Johan Månsson, Karen Marie Mathisen, and Camilla Wikenros. 2021. Ecological Effects of Wolves in Anthropogenic Landscapes: The potential for trophic cascades is context-dependent. *Frontiers in Ecology and Evolution* 8: 1-12.
- Bennett, Jane. 2010. *Vibrant Matter: A Political Ecology of Things*. Durham: Duke University Press.
- Burke, Anthony, Stefanie Fishel, Audra Mitchell, Simon Dalby, and Daniel Levine. 2016. Planet Politics: A Manifesto from the End of IR. *Millennium: Journal of International Studies* 44 (3): 499-523.
- Carter, Bob, and Oliver J. T. Harris. 2020. The End of Normal Politics: Assemblages, Non-Humans and International Relations. In *Non-Human Nature in World Politics: Theory and Practice*, ed. Joana Castro Pereira and André Saramago, 13-31. Cham: Springer.
- Ceballos, Gerardo, Paul R. Ehrlich, and Rodolfo Dirzo. 2017. Biological annihilation via the ongoing sixth mass extinction signalled by vertebrate population losses and declines. *Proceedings of the National Academy of Sciences of the United States of America* 114 (30): E6089-96.
- Crutzen, Paul. 2002. Geology of Mankind. *Nature* 415 (23) (January 3). <https://www.nature.com/articles/415023a> (Accessed September 27, 2022).
- Cudworth, Erika, and Stephan Hobden. 2018. *The Emancipatory Project of Posthumanism*. Abingdon: Routledge.
- Dryzek, John. 2005. *The Politics of the Earth: Environmental Discourses*. Oxford: Oxford University Press.
- Dryzek, John, and Jonathan Pickering. 2018. *The Politics of the Anthropocene*. Oxford: Oxford University Press.
- Eckersley, Robyn. 2017. Geopolitical democracy in the Anthropocene. *Political Studies* 65 (4): 983-99.
- Elias, Norbert, ed. 2007a. Reflections on the great evolution: two fragments. In *Involvement and Detachment*, 179-233. Dublin: Dublin University College Dublin Press.
- Elias, Norbert. 2007b [1987]. *Involvement and Detachment*. Collected Works, vol. 8. Dublin: Dublin University College Dublin Press.
- Elias, Norbert, ed. 2007c. The fishermen in the maelstrom. In *Involvement and Detachment*, 105-78. Dublin: Dublin University College Dublin Press.
- Elias, Norbert, ed. 2010 [1985]. Humana Conditio. In *Collected Works*, vol. 6, 75-170. Dublin: Dublin University College Dublin Press.

- Elias, Norbert. 2011 [1991]. *The Symbol Theory*. Collected Works, vol. 13. Dublin University College Dublin Press.
- Elias, Norbert. 2012a [1978, 1970]. *What is Sociology?* Collected Works, vol. 5. Dublin University College Dublin Press.
- Elias, Norbert. 2012b [1939]. *On the Process of Civilisation. Sociogenetic and Psychogenetic Investigations*. Collected Works, vol. 3. Dublin University College Dublin Press.
- Gaffney, Owen, and Will Steffen. 2017. The Anthropocene Equation. *The Anthropocene Review* 4 (1): 53-61.
- Gare, Arran. 2014. Deep Ecology, the Radical Enlightenment and Ecological Civilization. *The Trumpeter* 30 (2): 184-205.
- Goudsblom, Johan. 1994 [1992]. *Fire and Civilization*. London: Penguin Books.
- Goudsblom, Johan. 2002a. Introductory Overview: The Expanding Anthroposphere. In *Mappae Mundi: Humans and their Habitats in Long-Term Socio-Ecological Perspective – Myths, Maps and Models*, ed. Bert de Vries and Johan Goudsblom, 21-46. Amsterdam: Amsterdam University Press.
- Goudsblom, Johan. 2002b. The Past 250 Years: Industrialization and Globalization. In *Mappae Mundi: Humans and their Habitats in Long-Term Socio-Ecological Perspective – Myths, Maps and Models*, ed. Bert de Vries and Johan Goudsblom, 353-78. Amsterdam: Amsterdam University Press.
- Goudsblom, Johan. 2002c. Conclusions: Retrospect and Prospects. In *Mappae Mundi: Humans and their Habitats in Long-Term Socio-Ecological Perspective – Myths, Maps and Models*, ed. Bert de Vries and Johan Goudsblom, 411-4. Amsterdam: Amsterdam University Press.
- Goudsblom, Johan. 2003. *The Anthroposphere: expansion and transformations*. Paper presented to the International Symposium on World System History and Global Environmental Change, Human Ecology Division, September 19-22, Lund University, Sweden.
- Goudsblom, Johan, Eric Jones, and Stephen Mennell. 1996. *The Course of Human History: Economic Growth, Social Process and Civilization*. Armonk/London: M. E. Sharpe.
- Haraway, Donna. 1992. The Promises of Monsters: A Regenerative Politics for Inappropriate/d Others. In *Cultural Studies*, ed. Lawrence Grossberg, Cary Nelson, and Paula A. Treichler, 296-8. New York: Routledge.
- Hickel, Jason. 2021. *Less is More: How degrowth will save the world*. London: Penguin Random House.
- Hopkins, Rob. 2014. *The Transition Handbook: From Oil Dependency to Local Resilience*. Totnes: Green Books.
- Hornborg, Alf. 2001. Vital signs: An ecosemiotic perspective on the human ecology of Amazonia. *Sign Systems Studies* 29 (1): 121-51.
- Hornborg, Alf. 2009. In Defence of the Nature/Culture Distinction: Why anthropology can neither dispense with, nor be reduced to, semiotics. *Cognitive Semiotics* 4: 92-115.
- Hornborg, Alf. 2017a. Artifacts have consequences, not agency: Towards a critical theory of global environmental history. *European Journal of Social Theory* 20 (1): 95-110.
- Hornborg, Alf. 2017b. Dithering while the planet burns: Anthropologists' approaches to the Anthropocene. *Reviews in Anthropology* 46 (2): 61-77.

- IPBES. 2019. *Global assessment report on biodiversity and ecosystems services of the intergovernmental science-policy platform on biodiversity and ecosystem services*. Bonn: IPBES Secretariat.
- IPCC. 2018. *Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Geneva: WMO.
- Kallis, Giorgos. 2011. In Defence of Degrowth. *Ecological Economics* 70 (5): 873-80.
- Kant, Immanuel. 2002. *Critique of Practical Reason*. Massachusetts: Hackett Publishing.
- Kant, Immanuel. 2006. *Anthropology from a Pragmatic Point of View*. Cambridge: Cambridge University Press.
- Karlsson, Rasmus. 2020. Conflicting Temporalities and the Ecomodernist Vision of Rewilding. In *Non-Human Nature in World Politics: Theory and Practice*, ed. Joana Castro Pereira and André Saramago, 91-110. Cham: Springer.
- Kurki, Milja. 2020. *International Relations in a Relational Universe*. Oxford: Oxford University Press.
- Latour, Bruno. 2005. *Reassembling the Social: An Introduction to Actor-Network Theory*. Oxford: Oxford University Press.
- Latour, Bruno. 2018. *Down to Earth: Politics in the New Climatic Regime*. Cambridge: Polity Press.
- LeCain, Timothy. 2015. Against the Anthropocene: A Neo-Materialist Perspective. *International Journal for History, Culture and Modernity* 3 (1): 1-28.
- Linklater, Andrew. 2011. *The Problem of Harm in World Politics: Theoretical Investigations*. Cambridge: Cambridge University Press.
- Malm, Andreas. 2020. *The Progress of This Storm: Nature and Society in a Warming World*. London: Verso.
- McNeill, J. R., and Peter Engelke. 2014. *The Great Acceleration: An Environmental History of the Anthropocene since 1945*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.
- Mennell, Stephen. 2003. Improving the Human Means of Orientation. *History of the Human Sciences* 16 (2): 164-71.
- Moyer, Jeanna. 2001. Why Kant and Ecofeminism Don't Mix. *Hypatia* 16 (3): 79-97.
- Newton, Tim. 2007. *Nature and Sociology*. Abingdon: Routledge.
- Odum, Howard, and Elisabeth Odum. 2001. *A Prosperous Way Down: Principles and Policies*. Colorado: University Press of Colorado.
- Pellizzoni, Luigi. 2016. Catching up with Things? Environmental Sociology and the Material Turn in Social Theory. *Environmental Society* 2 (4): 312-21.
- Pereira, Joana, and André Saramago, eds. 2020. *Non-Human Nature in World Politics: Theory and Practice*. Cham: Springer.
- Pereira, Joana Castro, and Eduardo Viola. 2018. Catastrophic climate change and forest tipping points: Blind spots in international politics and policy. *Global Policy* 9 (4): 513-24.
- Plumwood, Val. 1993. *Feminism and Ecology*. New York: New York University Press.
- Plumwood, Val. 2005. Towards a Progressive Naturalism. In *Recognizing the Autonomy of Nature: Theory and Practice*, ed. Thomas Heyd, 25-53. Berlin: De Gruyter.

- Quilley, Stephen. 2004. Social Development as Social Expansion: Food systems, prosthetic ecology and the arrow of history. *Amsterdam Sociologisch Tijdschrift* 31 (3): 321-48.
- Quilley, Stephen. 2009. The Land Ethic as an Ecological Civilizing Process: Aldo Leopold, Norbert Elias and Environmental Philosophy. *Environmental Ethics* 31 (2): 115-34.
- Quilley, Stephen. 2010. Integrative levels and 'the Great Evolution': Organicist biology and the sociology of Norbert Elias. *Journal of Classical Sociology* 10 (4): 391-419.
- Quilley, Stephen. 2011. Entropy, the Anthroposphere and the Ecology of Civilization: An essay on the problem of 'liberalism in one village' in the long view. *The Sociological Review* 59 (1): 65-90.
- Quilley, Stephen. 2013. De-Growth is Not a Liberal Agenda: Relocalisation and the Limits of Low Energy Cosmopolitanism. *Environmental Values* 22 (2): 261-85.
- Quilley, Stephen. 2020. Elias in the Anthropocene: Human Nature, Evolution and the Politics of the Great Acceleration. In *Non-Human Nature in World Politics: Theory and Practice*, ed. Joana Castro Pereira and André Saramago, 111-39. Cham: Springer.
- Quilley, Stephen, and Steven Loyal. 2005. Eliasian Sociology as a 'Central Theory' for the Human Sciences. *Current Sociology* 25 (3): 807-28.
- Rohloff, Amanda. 2019. *Climate Change, Moral Panics and Civilization*. Abingdon: Routledge.
- Saramago, André. 2019. Reality-congruence, emancipatory politics and situated knowledge in International Relations: A process sociological perspective. *International Relations* 34 (2): 204-24.
- Saramago, André. 2022. Post-Eurocentric grand narratives in critical international theory. *European Journal of International Relations* 28 (1): 6-29.
- Schmelzer, Matthias, Aaron Vansintjan, and Andrea Vetter. 2022. *The Future is Degrowth: A Guide to a World Beyond Capitalism*. London: Verso.
- Schoukens, Hendrik. 2020. Rights of Nature in the European Union: Contemplating the Operationalization of the Eco-Centric Concept in an Anthropocentric Environment? In *Non-Human Nature in World Politics: Theory and Practice*, ed. Joana Castro Pereira and André Saramago, 205-34. Cham: Springer.
- Severson, Kim. 2021. No Soil. No Growing Seasons. Just Add Water and Technology. *New York Times* (July 6) <https://www.nytimes.com/2021/07/06/dining/hydroponic-farming.html> (Accessed September 27, 2022).
- Subramanian, Meera. 2019. Anthropocene now: Influential panel votes to recognize Earth's new epoch. *Nature* (May 21) <https://www.nature.com/articles/d41586-019-01641-5> (Accessed September 27, 2022).
- Symons, Jonathan. 2019. *Ecomodernism: Technology, Politics and the Climate Crisis*. Cambridge: Polity Press.
- Trexler, Adam. 2013. Integrating Agency with Climate Critique. *Symploke* 21 (1): 221-37.
- Verdoliva, Salvatore, Dylan Gwyn-Jones, Andrew Detheridge, and Paul Robson. 2021. Controlled comparisons between soil and hydroponic systems reveal increased water use efficiency and higher lycopene β -carotene contents in hydroponically grown tomatoes. *Scientia Horticulturae* 15 (March 15)

- <https://www.sciencedirect.com/science/article/pii/S0304423821000030> (Accessed September 27, 2022).
- Villalba, Unai. 2013. Buen Vivir vs. Development: A Paradigm Shift in the Andes. *Third World Quarterly* 34 (8): 1427-42.
- Waal, Frans B. M. de, ed. 2002. Apes from Venus: Bonobos and Human Evolution. In *Tree of Origin What Primate Behaviour Can Tell Us about Human Social Evolution*, 39-68. Cambridge, MA: Harvard University Press.
- Youatt, Rafi. 2020. *Interspecies Politics: Nature, Borders, States*. Michigan: University of Michigan Press.

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Introduction

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Remembering Johan Goudsblom.

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The Trajectory of Human History.

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