

Chapter 2

What Is Nature?

Abstract An exploration of nature as a concept and as a reality can be organized in many different ways. Yet if a decisive break can be found in the history of the human understanding *and* perception of nature, is the one represented by Darwinism. It makes sense then to take it as the turning point in the history of the concept. After an initial reflection on the very notion of ‘naturalness’, this chapter will trace the origins of the term in Ancient Greece and will then follow its semantic mutations throughout history, a conceptual development that run parallel to human-induced material transformations in nature. From the Greeks to Escholastics, from the Renaissance to Descartes and Bacon, an overview of how nature was conceived before the advent of Darwinism is offered, before the latter itself is presented. Darwin’s legacy is considered, including the new conception of human nature that derives from it and the rise of ecology as a scientific discipline that is concerned with nature as an harmonious and dynamic system of particular relations. Other, non-Western views of nature are also considered, a survey that poses an uncomfortable question: the discrepancy between respectful ideals of the human-nature relation that do not translate into peaceful human practices.

Keywords Nature · Natural/artificial · Hybridization · Ancient Greeks · Christianity · Cartesianism · Darwinism · Ecology · Industrialism · Anthropocene · Eastern religions

2.1 The Intricacies of Nature

How is nature to be defined? The wide semantic scope of the concept makes it difficult to isolate an unequivocal meaning for one of the most ambitious words in language, one that intends to name all living things and processes. As a result, such a word can hardly be neutral, as it will be infused from the outset with a dominant type of interpretation of that very multiplicity—be it ideological, metaphysical, or religious (Williams 1980: 69). Thus a metaphysical substratum

has burdened and complicated the concept throughout its linguistic history. At the same time, the reality that it tries to grasp has changed too, due to its own material history and to its ever-increasing intermingling with society.

Nevertheless, there is a reasonable starting point for defining what nature is: nature is that what is not artificial. The concept of nature would thus cover all those entities and processes that come into being or exist without any human intervention. Natural entities are not the result of human intentions, but rather they exist independently from human designs or purposes. Therefore, we can understand nature, as John Stuart Mill does, as “all the powers existing in either the outer or the inner world and everything which takes place by means of those powers” (Mill 1998: 8). In Pollini’s words:

The environment is, by definition, an anthropocentric concept, in contrast to nature, which refers, by definition, to an otherness, or to the otherness, the mysteries, within ourselves. The environment, as well as its representations, are socially constructed, at least in part, whereas nature, by definition, is not socially constructed (only its representations are) (Pollini 2013: 39).

Nature can then be characterized as a self-generating and self-sustaining entity defined by its *telos*, i.e. by its ability to maintain its organisation in the presence of external forces and to exert its own force on its environment while trying to maintain its integrity (Heyd 2005: 4–5). According to this teleological view, nature is autonomous from human beings. The autonomy of nature derives from its very existence. Nature is thus

what has come into existence, continues to exist, and finally, disintegrates/decays, thereby going out of existence, in principle, entirely independent of human volition or intentionality, of human control, manipulation, or intervention (Lee 2005: 59).

In this view, it is a teleology that has not to do with mankind, but with nature’s own goal-orientedness, which at the same time is the trait that would demonstrate its intrinsic value. So that ontology would matter more than history.

But is this a sensible way of defining nature? Or is it just an easy escape from its intricacies? Although there is a sense in which nature certainly consists of the casual powers that exist independently of human beings, this definition is too limited. It does not pay attention to the actual way in which the relationship between nature and humanity *unfolds*. Natural history is also social history—one that has spread human influence in so many ways, in such a scale, that it is now difficult to tell whether humanity is *absent* or not from a given natural process or a certain natural entity. In fact, it will most probably not. Goethe was already aware of this, as he cautioned that the nature that we face “is not nature anymore, but a completely different entity than the one ancient Greeks had been occupied with” (Goethe 2006: 15). We have kept the word, but the world that it refers to has vanished.

Are domesticated animals, man-designed rivers, or managed ecosystems still ‘natural’? If we stick to a strict distinction between the natural and artificial, they are not, since they have been mixed up with society and they remain autonomous only in a literal sense, i.e. their core components have not been created by

human beings. Yet rather than adhering to a hollow understanding of autonomy, this socionatural promiscuity should be accepted, not resisted. It is time to move beyond a definition of nature that relies on the absence of any trace of human influence. History, rather than ontology, is the proper guide for understanding nature today.

Soper's (1995) well-known distinction between a *deep* and a *shallow* nature is relevant in this context. Whereas the former refers to the causal powers and structures that operate constantly in the physical world and are the condition for any human intervention in the environment or the biological realm, the latter is the nature of our immediate experience in everyday life: animals, the natural environment, our bodies, material resources. On his part, Birnbacher (2006) distinguishes nature in a *genetic* sense from nature in a *qualitative* sense. The former refers to the moment of nature's coming into existence without human intervention, whereas the latter alludes to the appearance of natural forms, which can be, and actually are, affected by human beings. Genetic nature's description is *historical*, whereas qualitative nature's description is *phenomenological*. Therefore, nature as an ahistoric essence is not the same as nature as an historic process. Yet what is more telling, the constraints exerted by the former or our interactions with the latter?

The historical process involved in such interactions is one of hybridization, that is, the environmental recombination that results after humanly originated processes and artifacts have exerted a variable degree of influence on natural beings and processes. Karafyllis (2003) has used the term *biofact* to name those entities whose origin and formation has been anthropogenically influenced, directly or indirectly, irrespective of the actual visibility of that influence. This influence may be intentional and straightforward, as much as nonintentional and indirect: take synthetic biology as an instance of the former, anthropogenic climate change as an instance of the latter. And take the Anthropocene as the category that tries to describe the overall outcome of this long process—which also includes the constant, pervading influence of historical nature on society.

However, neither naturalness nor hybridization are absolute categories. On the contrary, they are relative ones—depending on the degree of human influence exerted upon each biological process, natural being, or ecosystem. As a result, apart from the trivial sense in which *everything* can be said to be 'natural', it seems more fruitful to think of nature as a gradable concept, insofar as it is a gradable reality. Besides, as Baertschi (2012) remarks reflecting upon artificial life, biotechnologies are moving the line separating the natural (what is grown) and the artificial (what is made)—a distinction, he adds, that we take as ontological and thus morally significant, whereas it should probably be understood as moral but lacking ontological consequences.

The opposition between the natural and the artificial is then to be conceived as a continuum: a fluffy dog is at one extreme, a wild dog at the other, while the middle is occupied by domesticated, purposefully crossbred, and genetically modified ones. Different degrees and types of intervention thus express different kinds of socionatural interactions. In order to determine how natural a being or

an ecosystem is, we have to study its history and inner composition. Thus it is the particular history of specific forms, assemblages, and processes what counts: how much human influence do they bear, of what kind, leading to which results. Those are the questions to be answered before the naturalness of a given being or ecosystem is weighed.

2.2 Towards a Semantics of Nature

But how did we get here? How have we reached this nuanced understanding of nature, the intellectual process of which acquisition is also a social and material process? How has society watched itself in the mirror of nature?

Needless to say, an exploration of nature as a concept and as a reality can be approached in many different ways. Human beings have been systematically reflecting upon nature for more than two thousand years, although the idea that a single entity may comprise the complex assemblage of beings and processes and raw matter that constitutes the non-human world is something rather unique to Western culture. Yet both Western and non-Western traditions of thought develop an intellectual or spiritual exploration of the non-human world, while also reflecting the impact that our changing relationship with the environment has had on human thought.

This may explain why the intellectual apprehension of nature has oscillated between an emphasis on human ideas and the acknowledgment that an abstract notion of the natural world has to be supplemented by a more materialist stance that takes into account the latter's relative independence and its influence on human history. Religious and philosophical speculation, together with scientific discoveries, punctuate a history throughout which our perception of the natural world and of ourselves (as human beings) have slowly but constantly changed. This also includes the development of normative traditions concerning how human beings ought to deal with the non-human world. How to avoid, then, the contradictions and ambiguities that affect any attempt to produce a semantics of nature?

Summarizing the history of this rich and complicated concept, along with the evolution of the socionatural relation itself, can be done in several ways. This chapter will trace the origins of the term in Ancient Greece and will then follow its semantic mutations, that run parallel to human-induced material transformations in nature. From the Greeks to Escholastics, from the Renaissance to Descartes and Bacon, up to Darwin and environmentalism, a brief overview of how nature has been conceived is offered.

Prior to that, though, two main premises should be underlined. Firstly, it seems fair to assume, as Glacken (1967) suggests in his *magnum opus* about the idea of nature in Western thought, that human beings have always searched for purpose and design in the natural world. The idea of order is manifest even in the mythological views of nature and began to be rationalized by the Greeks. Although it has been contested, it remains firmly in place as our intuitive response to the facts

of nature: we find regularities rather than discontinuities, although the latter are known to exist. Furthermore, a teleological nature has often been conceived of as existing on humans' behalf, but even if such notion seems just an anthropocentric delusion, the idea of design—even a design without designer—does not appear to be so easily discarded.

Secondly, the most important shift in our view of nature takes place with the publication and reception of Darwin's *The Origin of Species* in 1859. Granted, Darwin is not without his own precursors, nor comes its theory out of a cultural void. Yet it is his groundbreaking work that paves the way for a completely new understanding of the natural world and, crucially, human beings themselves. Darwin provided an explanatory device—evolution—that relocates humanity within the natural world in a revolutionary fashion, showing our common genealogy with other creatures and providing new tools for the study of life. In showing that nature is apparently deprived of any religious or moral foundation, let alone any inherent goal other than self-reproduction, Darwinism also had a major impact on culture and politics—one that may yet to be fully felt. Hence it makes sense to take it as the turning point in the history of the concept. Still, it remains a moot point whether Darwinism has had a significant impact on human practices *vis-à-vis* the natural environment, or those practices—reflecting a human impulse towards the colonization of nature—have remained more or less constant throughout history, thus being more influenced by changes in the technology available to deepen the socionatural imbrication.

2.3 Nature Before Darwin

It is in Homer (c. 7000 BCE) where the word 'nature' (φύσις) appears among the Greeks for the first time. Therein is applied to plants in order to describe their specific 'character', an archaic usage of the word that already refers to innate characteristics of beings and things. Yet the term was immediately used to name the multiplicity of such entities, believed by many pagan cultures to be alive. From the outset, the notion of nature designated the visible material world as well as the creative forces underlying it. A distinction that has been present and even gradually deepened in the history of thought: that between the inside and the outside of things and beings.

The first rational approach to nature was developed by Pre-Socratic philosophers, who suggested that there is an order underlying this formidable assemblage of entities. It is an order that can actually be discovered through observation and deduction. In fact, this new way of looking at the world involves the very *invention* of nature, as there is a shift from partial considerations about the quality of some objects to the notion of a natural dominion that comprises the totality of phenomena (Lloyd 1992: 22). And if there is an order in nature, is there not also a design and even a moral purpose? No matter how naïve this assumption may seem to us, it was a plausible idea for a very long time. It was advanced by philosophers like

Euripides and historians like Herodotus. As Glacken claimed, the notion of nature as the result of a conscious design that actually fits human needs will become a key element in Western constructions of nature (Glacken 1967). Nothing would then be vain in the latter, everything would make sense. This is already explicit in Aristotle and was later infused with an almost parodic undertone in thinkers like the Stoic Chrysippus, who claimed that the fly is useful because it wakes up the lazy. Inside this culture, though, a non-teleological view of nature's order was also developed by Epicurus, whose *De rerum natura* laid the foundations for a materialistic conception of nature later refined by Marx and Engels (see Foster 2000).

Notwithstanding this moral orientation, Greek thinkers linked their reflections to practical life. Their speculation about the environment was naturally accompanied by a material intervention in it. After all, the human species impulse towards survival and self-betterment is expressed even in the most apparently peaceful relations to the environment. As Hugues (2009: 21) notes, even the primal tradition of the human race—the culture of hunting, fishing, and gathering—does not leave nature undisturbed. Let us add to that the impact that cities had on the human perception of nature and thus on the relationship with it. Apart from their environmental impact, cities created the impression of a human *separation* from nature, seen as a detached realm—an orderly one, as opposed to the chaotic outer nature. Nevertheless, maybe this was not just an impression, but the beginning of a simultaneous human move *away* from nature and *into* nature.

Nature's desacralization is reinforced by the Christian narrative. In the Old Testament, a distinction between the divine and the natural is to be found, signalling that the Christian God is not immanent but transcendent: He has created nature, but He is not nature (Passmore 1974). This belief is absent in other Middle-East religions. A later scholastic distinction between God as *natura naturans* (creative nature) and the World as *natura naturata* (created nature) is already present here. It reinforces the gradual human detachment from nature and serves as a theological justification for material practices (mainly agricultural) already firmly in place. Origen, an early Christian theologian, draws on the Psalm 104 to support the purposefulness of nature: "You cause the grass to grow for the livestock and plants for man to cultivate". Throughout the Middle Ages, Christian thinkers perpetuated this view, which however suffered subtle but important variations, paving the way for the modern understanding of nature. In fact, it is the Medieval insistence on the divine rationality of the world that arguably lies behind the Western belief in the existence of hidden natural laws that can be scientifically discovered (Whitehead 1997). A thread that connects theology, science, and even alchemy.

Yet again, every tradition leaves room for alternatives. As White (1967) famously pointed out, figures such as Saint Francis of Assisi, Hildegard de Bingen or even Teilhard de Chardin are representatives of a more holistic view of nature, one that looks for some kind of mystical communion with it and defends the need to protect it from human action. Their roots can be found in the Bible, too—an open text if there ever was one. It can thus be argued that the Jewish-Christian tradition includes both an instrumental and a non-instrumental view of nature, a reflection of the complex inheritance of the European cultural code (Eder 1995).

Moreover, might it not be the case that every culture possesses, in different degrees of sophistication, a branch of thought devoted to dominate nature as well as other oriented to marvel at it?

Be that as it may, the transition from belief to reason is observable through the metaphors applied to the natural world. One is that of nature as a book wherein the divine wisdom can be ‘read’, an idea that the Renaissance would secularize, turning nature into a text wherein we do not search for God’s signals, but for nature’s own secrets. Remarkably, we refer nowadays to DNA as a text or a code. A very different metaphor is the organic one, a view of nature as a living body that perpetuates a vitalist tradition of thought that runs parallel to the rationalization of the non-human world. According to this organic conception, everything in the cosmos is alive and connected. Such a cosmology is represented in a Great Chain of Being that links hierarchically every component of the universe. This representation of nature passed from the Greek philosophers to the Medieval thinkers, retaining its influence until the eighteenth century (Lovejoy 1936). It was used to depict society as well, as an entity where different social classes represented body organs, each with a function to perform (Clark 1989: 250). Yet the most important development in scholastic thinking is the separation between metaphysics and the natural sciences as different approaches to the non-human world: a *physica speculativa* or philosophy of nature as separated from a *physica empirica* or natural science (Schipperes 1978: 226). Such development is the precondition for the conception of nature brought about by the Scientific Revolution of the seventeenth and eighteenth centuries.

Outside the linguistic realm, substantial environmental changes caused by human societies took place in the Middle Ages around the inhabited world. Agricultural land expanded, deforestation abounded, population increased: the species was changing its ways on Earth, as new findings about the workings of nature were gradually amassed. In this time, a new regulatory idea about the socio-natural relation gains weight: that human beings are the ones who must perfect it. Paracelsus believed nature to be unfinished, alchemy being in the eyes of God a tool for improving it (Eliade 1987: 151). A new legitimacy for interfering with nature thus emerges, whose traces can even be detected in some strands of modern environmentalism—after all, let us better be responsible stewards than destructive spoilers. Nature starts to be seen as an incomplete creation and soon would be conceived as an inert entity.

This shift is supported by the rise of the mechanical arts and the applied science. All kinds of crafts and occupations are now praised. For instance, an engineer is now an architect of social progress, a harbinger of the new. Correspondingly, the Christian ideal of a *vita contemplativa* is slowly replaced by the mundane *vita activa* whose eulogy can be found in Giordano Bruno and later in Descartes and Bacon (see Rossi 2001: 21). As Schipperes has pointed out, the Arabic reception of Aristotle and the Christian scholastic amounts to the very beginning of this re-orientation, paving the way for the Scientific Revolution and even Darwinism itself: nature ceases to be a timeless, quiet entity, becoming an order that grows and changes (Schipperes 1978: 226–227).

And yet, this is the time during which nature was most rigidly conceived. Far from the vitalist tradition, the mechanical philosophy associated with Descartes (2005) and Bacon (2009) refused to see nature as a living entity, suggesting instead that it should be understood as inert matter acted upon by stable physical laws. To Merchant (1980), this is tantamount to the “death of nature”. The corresponding metaphor is that of a machine, human beings conveniently possessing a soul that distinguish them from soul-less animals. Arguably, the human-nature dualism as we know it begins here. It is not a merely descriptive dichotomy, but a *hierarchical* one: human beings stand above nature, which in turn is composed of objects *metaphysically* separated from us (Plumwood 1993: 111; Pepper 1996: 140). The world was being emptied out. Moreover, according to the Baconian creed, knowledge of nature means power over nature. A rising capitalism provided an additional impulse to this scientific agenda. All in all, time was ripe for the conquest of nature, i.e. for a more sophisticated, accomplished dominion of it.

This is a rather interesting path. The mechanical philosophy was a logical step in the process of discovering the inner workings of nature. As Cassirer (2009) noted, nature has to be conceived first as an *order*, namely, as a body of laws that humans can discover and take advantage of. It is an order detached from any guiding divinity, although the philosophers of the Enlightenment were often deistic, thus accepting the possibility of a godly creation of reality. La Mettrie (1996) would not distinguish any morality or consciousness in the functioning of both human and natural machines. Yet mechanism was also contested within the Enlightenment. Kant himself pointed out how mechanism was unable to explain movement in nature, i.e. it could not explain the signs of life in the machine (see Kant 2008: 202). Such flaw was noted by physiologists, who actually became phenomenologists in their experimental approaches to natural events (Hankins 1985: 115). A certain vitalism thus takes shape, breathing new life into nature. In turn, this involves the acceptance that nature has a history, that it unfolds and develops, thus breaking some ground for Darwin’s evolutionism.

Actually, a new conception of nature slowly emerges in that time, foreshadowing ecology. Breaking with mechanism, it emphasizes diversity over unity, heterogeneity over homogeneity, the whole over the parts. Diderot’s *Pensées sur l’interprétation de la nature*, published in 1753, are an important landmark of this new thinking. The French *philosophe* warns about the human inability to grasp the complexity of the natural order he marvels at—an attitude later reproduced by many environmental philosophers (Diderot 2000). Likewise, German idealism—from Goethe to Herder and Humboldt—see nature as a whole, a totality, thus pointing to the very underside of the Enlightenment: Romanticism. The Romantic nature, expressed as much in philosophical writings as in poems and novels, is dynamic and vital, aesthetically reach and emotionally moving. It cannot be reduced to the sum of its parts, and possesses a number of intrinsic qualities whose meaning and value are independent from human evaluations (see Pepper 1984: 79). According to this view, nature should not be rationalized too much, nor instrumentalized by human beings.

It would not be late before nature's richness would be fully confirmed. Several voyages of discovery rendered a surprising amount of information about different species of plants and animals, fostering natural historian's efforts to systematize such profusion. The Swedish botanist Linnaeus developed the first such universal system, although a century later the idea of a stable taxonomy was questioned by two leading travellers of the 18th century, the German geographer Alexander von Humboldt and the English geologist Charles Lyell. Something was missing. It was the English naturalist Charles Darwin, after a trip to the Galapagos Island, who discovered what it was, thus changing the prevailing human conception of nature for good. Yet, this huge novelty notwithstanding, nothing changed much in a socionatural relationship that remained marked by the human attempt to colonize and exploit the natural world.

2.4 Nature After Darwin

If the buoyant and diverse natural world encountered overseas posed new questions about the evolution of life on Earth, it was Malthus' (1980) ideas about ecological limits of given habitats that provided Charles Darwin with the answer he was looking for, namely, a mechanism able to explain such evolution. He argued that ecosystems can only support a limited amount of human population, due to the fixed fertility of every organism or landscape. Darwin (2008) asked himself by which means could the subsequent natural equilibrium be reached. He answered that those organisms better equipped to deal with their environmental conditions should drive out their competitors, while at the same time variations among individuals of the same species become determinants of survival and, over time, evolution itself. The latter is then a product of natural selection. It follows that every creature on the planet, human beings included, share a common ancestor.

Instead of seeing nature as a static entity operated by mechanical laws or as an assemblage of beings hierarchically fixed to each other, Darwin exposed a nature that—although governed by some universal laws—had a history of its own; a history in which chance and randomness also have a place. In fact, natural selection and ecological adaptation include occasional leaps and episodes of maladaptation, as can be expected from an order made up by myriads of creatures interacting in complex patterns in several different ecological scenarios over an incredibly long amount of time. Evolution is a process by which species adapt to their environment—sometimes by changing it, as is the case with human beings. As Darwin writes:

I should premise that I use the term Struggle for Existence in a large and metaphorical sense, including dependence of one being on another, and including (which is more important) not only the life of the individual, but success in leaving progeny. Two canine animals in a time of dearth, maybe truly said to struggle with each other which shall get food and live. But a plant on the edge of a desert is said to struggle for life against the drought, though more properly it should be said to be dependent on the moisture (Darwin 2008: 51).

Natural selection is thus about adaptation to local environments, not about superiority or inferiority among organisms. Yet this hierarchical image is so powerful and widespread, that it has dominated the popular perception of Darwinism until today (Foster 2000: 188). And the same goes for the meaning of natural selection. As Bowler (2009) has shown, evolutionism triumphed at least in part because it was adapted to the increasingly popular idea of progress, so that, in fact, Darwin did not present his theory to a public that had never considered the possibility of evolution (partly because geologists had already challenged the literal interpretation of the Genesis by showing that Earth and its inhabitants *had* changed). But despite the influence of progressivism, Darwin himself emphasized that there is no force behind evolution, and thus no direction for the latter. Therefore, evolution is a naked force that abolishes any teleological explanation for nature's history, let alone the notion that nature has the *function* of being useful to human beings. However, public perception somehow struggles with this aspect of the Darwinian revolution, maybe because human beings tend to adopt a teleological point of view, thus assuming that change throughout time cannot possibly be a directionless one.

On the other hand, as Worster (1977) has argued, Darwin's theory of evolution was grounded in ecology. Dwelling on the Linnean "economy of nature" and Humboldt's description of mutually dependent communities, he saw nature as a web of complex relations and ecological interdependences: a grand scheme of cooperative integration. Yet unlike early ecologists and natural philosophers, Darwin hinted that there was not a fixed amount of natural allotments within this order. On the contrary, ecological divergences take place that increase the diversity of organic types in a given area without competition. Deviance from the norm would then be a second law of nature, together with competition itself: the survival of the fittest is thus supplemented by the survival of the newest. As Worster himself acknowledges, Darwin did not pursue this argument enough, probably influenced by how economic matters were framed in his time, and remained unable to reconcile the new view of nature as a diverse collection of organisms striving for self-reproduction and the Malthusian notion that ecosystems contain a limited amount of places to accommodate them.

Crucially, though, nature ceased to be considered a passive entity, to be acknowledged instead as an innovative, reproductive force. It thus regained part of the vitality that had been lost under the influence of mechanical philosophy. From this new vantage point, it can even be contemplated as a form of self-unfolding art, as Peter Sloterdijk has it:

Viewed through the opera glasses of evolutionary theory, the thing we call life is nothing other than a vaudeville with an immeasurable wealth of forms in which every branch of artistry, that is to say every species, attempts to perform the feat of all feats: survival (Sloterdijk 2013: 117)

Although this alternative view of nature had been kept alive by Romantic philosophers and artists, it was now also pursued by scientists themselves. Somehow, nature's 'creativity' has been displayed over time and by looking into its

configurations and shapes we can also look into its distinctive history. In this regard, departing from the Darwinian insights about the relational quality of the struggle for existence, a new branch of modern science, that of ecology, was established at the end of the nineteenth century. The term is attributed to German anatomist Haeckel (1866) and designates the attempt to find scientific regularities in a view of nature characterized by complexity and dynamism. It turns out that nature may possess a design even though we have ruled out the notion of a conscious designer.

Haeckel defined ecology as the body of knowledge that concerns the economy of nature, understood as the complex interrelations referred by Darwin as the conditions of the struggle for existence. As Hughes (2009: 7) writes, this was less the definition of an already existing science than a new, ambitious research agenda. In the following years, a number of researchers took on the task of advancing it. Karl Möbius in 1877 coined the word *biocoenosis*, meaning something close to *biocommunity*, whereas Victor Shelford in 1929 described ecology as “a science of communities”, Arthur G. Tansley coined the term *ecosystem* in 1935, and plant ecologist Arthur Tansley preferred to talk about a “biotic community” that includes all living organisms in a given territory. Interestingly, ecologists argued over how to describe best the kind of relations that are set in a biotic community: are they to be featured as forming an organism, using the images of sociology and economics, or through the metaphor of the machine? (see Worster 1977). At the end of that century, Capra (1997) talked about a “web of life”, an apt image in that it underlines the interdependence of its elements. Yet the debate is not settled, since Lovelock’s Gaia, together with the insights of world-system science, seems to fit even better with the metaphor of a giant organism—one that, now, happens to incorporate society.

But Darwinism was also revolutionary in that it completely changed human’s place in nature. After Darwin, the kind of human exceptionality championed by Western tradition became untenable. Natural evolution demonstrated the genealogical kinship of all living creatures, hence demanding a thorough revision of the human-nature dividing line. Humans could not be seen anymore as autonomous beings which are separated from nature, but rather as creatures embedded in the latter in ways neither foreseen nor expected. In sum: “We are not just rather like animals; we *are* animals” (Midgley 1995: xxxiii). Such is the underlying assumption of any critique of dualism, a critique that often involves the attempt to attribute moral responsibilities to humans towards non-humans. But the Darwinist revolution works both ways: it does not only entail a demystification of mankind in relation to nature, but also, correspondingly, a demystification of nature in relation to mankind (Janich 2010: 12). In other words, neither humans nor the natural world may be said to possess a transcendental meaning anymore. In short, a moralization of the human-nature relationship cannot be so easily derived from a Darwinian worldview.

On the other hand, Darwinism laid the foundations for a naturalistic explanation of human beings, that is, an explanation based on a biological interpretation of human behaviour and culture. Whereas dualism sees a gap between mankind

and nature that demands a separated approach to all human matters, naturalism claims that such a gap does not actually exist and stresses the need for a biologically-based analysis of human beings. The ensuing conflict among these approaches, as well as within them, revolves mainly around the degree of autonomy to be granted to human behaviour and its collective expressions, namely, culture and society. In recent decades, a handful of scientific disciplines united by a common interest in brain processes—such as neuroscience, cognitive science and social psychology—are contesting the received notion that everything is socially constructed and amenable to social solutions, claiming instead that a more dense notion of an innate human nature should be incorporated into the framework of social sciences. Sociobiology would be at one end of this spectrum, claiming that human behaviour and organization can be explained in purely evolutionary terms (see Wilson 1975), whereas the opposite side would correspond to radical forms of constructivism for which everything is constructed and thus amenable to change in purely social terms. Middle grounds, of course, abound.

Scientific explorations of nature are also increasingly reliant on genetics and microbiology, thus reaching deeper layers of organic life and achieving a better understanding of natural processes and systems. None of this could have happened without the deceptively simple insights provided by Darwin. Yet this is far from being a finished task. There remains deep mysteries in nature, among them a more precise understanding of the inner life of animals or a better knowledge of genes functioning. We stand still on the threshold and a time of further discoveries awaits ahead. An important part of them will concern the intimate, complicated relationship between humans and nature.

In this regard, when Darwin published his revolutionary work in 1859, the Industrial Revolution was already under way. As it is now more evident than ever, the industrial transformation of society brought about the most significant change in the relations between society and nature. Mechanization, rationalization, creation of social time, gradual dismantling of traditional communities, intense use of natural resources, population growth, intensive use of the soil, fast urbanization, globalization of trade, waves of migration, relocation of species, adoption of foreign seeds and recipes—features of a multifarious process that creates the foundation for the current state of socionatural relations. To many environmental historians, this enormous shift in the practical relations between human beings and nature culminates the former's alienation from the latter. The nature of this process is revealed in the long run as much as in minor details: bread ceases to be done at home, to be produced in factories, soon without being touched by human hands, thus depriving people from any contact with the organic world (Mazlish 1995: 63).

In the course of the twentieth century, the human colonization of nature escalates, in a process of such magnitude that geologists have suggested that we have entered into a new epoch, the Anthropocene—to be examined in detail later. Some basic data will now suffice to give an impression of the substantial change that has taken place during this process—data that also makes apparent how little do Darwinian *ideas* altered basic human *practices* vis-à-vis the natural environment. From 1890 to 1960, human population grew from 1.57 to 3.02 billion; in

1890, there were nine cities with over 1 million inhabitants, whereas now more than half the human population live in cities; the world GDP amounted to 470 trillion US dollars (from 1990) in 1870, but reached 11.664 in 1992; and so forth. As John McNeill has put it: “The human race, without intending anything of the sort, has undertaken a gigantic uncontrolled experiment on the earth” (McNeill 2000: 4). Such collective unawareness is not a mere nuance. As he himself points out, “the regime of perpetual disturbance is an accidental by-product of billions of human ambitions and efforts, of unconscious social evolution” (2000: xxii). In other words, it is an species issue, the result of a process of creative *and* destructive adaptation—an aggressive one in any case—whose denouement is yet unclear.

To many commentators, though, there is nothing *essentially* human in the current socionatural relations, nor in the cultural and social path that has led to them. Both the cultural understanding of nature and the social practices that derive from it may be said to be the product of a cultural *construction* that, by definition, can bear many different fruits. Therefore, it is important not to forget that there have been and still are conceptions of nature *other* than the Western one, even though they have not become dominant for reasons that remain to be singled out.

2.5 Other Views of Nature?

We is a dangerous pronoun, because it tends to take too much for granted, hiding or repressed alternatives that lie within a tradition or exist outside of it. For that reason, the Nigerian-American novelist Teju Cole asks himself in his Twitter account: *We who?* The same goes for nature: Whose nature? What other conceptions of it have circulated in human culture, and what kind of practices have they supported or helped to create?

In a famous article published in 1967, in the height of the Western counter-culture that looked East in the search for alternative social values, Lynn White alluded to Zen Buddhism as a tradition that embodies a different—more respectful—view of nature. Deep ecologists have also searched in Eastern traditions for a more spiritualized relation with the environment, wherein the latter is less a human instrument than an end in itself. On the face of it, Eastern religions and philosophies tend to see existence as a web of intricate and cyclical relations between the material and the spiritual spheres, as well as between the human and the natural, rather than as a set of dualisms (Egri 1999: 66). Those are interesting ideas, that can be actually traced back in time and be found also in the Western world. The problem, again, is how little those ethical mandates are respected in the realm of material practices, a constant that suggests a different function for the former: they might be less absolute prescriptions than general orientations for behaviour, whose goal is not that nature remains untouched, but to reduce the impact of its human appropriation.

In his survey of those systems that formed human ideas about the natural world in Antiquity, Hughes (2009: 53) distinguishes three main categories: traditional

systems that included earlier ideas along with new ones; reformers who taught the oneness of life, including humans and nature; and monotheistic religions that made humans God's stewards. Within the first group, that includes beliefs such as Hinduism and Shinto, systems tend to gather symbols and practices of ancestral human-gatherer, agrarian, and pastoral societies, often retaining the worship of natural entities and teaching practices that encompass conservation (although the related taboos, such as the caste system in India, that limits the use of specific resources to designated hereditary groups, were not always effective). More interestingly, a second group of world systems originated in the ancient world taught the oneness of life and an ethic of respect that *seemed* to have encouraged the preservation of nature: Jainism, Buddhism, Taoism, as well as the Pythagorean doctrine. Let us remember that the first principle of Buddhist ethics is "do no harm", whereas the Jainas defended a doctrine of non-violence to any living thing. Life should be kept simple, happiness lie in the suppression of every desire. Finally, monotheistic religions—such as Zoroastrianism, Judaism, Christianity, and Islam—tend to preach a doctrine of stewardship, although their foundational texts are such a layered compilation of parables and rules that some other interpretations are possible too.

On his part, Callicott (1994) surveys a wide range of environmental ethics throughout history and around the world, adding to the oft-cited Asian alternatives some reflections on South-American (mostly Amazonian), African, and Australian indigenous views on nature. Predictably enough, they do not differ much. Their respective myths and parables reflect the different environmental conditions they live in, but, although some surprises arise (such as discovering that African religions tend to be both monotheistic and anthropocentric), their belief systems regarding nature underline the need to respect natural limits, finding some sort of spiritual unity with the environment.

Notwithstanding the apparent diversity of nature's conceptions, two points should be made. On the one hand, variations are not infinite, but rather limited. There cannot exist endless versions of nature—nor endless different ethics derived from them. Some basic cleavages may be identified: animism/materialism, immanentism/transcendentalism, dualism/holism, male-oriented/female-oriented, appropriationism/conservationism, separateness/relatedness. In turn, they lead to just a number of basic attitudes, ranging from bare dominion to responsible stewardship and a peaceful dominion. Diversity, thus, is limited; the nuances of that limited diversity are countless.

Interestingly, though, the majority of those ethics (including the monotheistic ones) command the protection of nature and natural resources. No clear statement of boundless use and domination can be found in these world systems. But then something is missing. The societies in which those world systems reigned did not show any remarkable record of environmental protection, just a different pace of human colonization according to the different degree in which material practices evolved in the direction of the currently hegemonic Western capitalistic model. As Hughes acknowledges: "the fact that environmentally positive teachings can be found in ancient religions and philosophies does not always surely indicate that

they were put into practice” (Hughes 2009: 79). And this includes Asia, despite the greater environmental awareness that their belief systems seem to embody.

Yet this surely means that below the latter operates a parallel set of beliefs that more or less explicitly fosters or at least allows the human appropriation of nature. It would be naïve to regard as idiosyncratically human those values that prevent the exploitation of nature, whereas those that do the opposite are deemed less than human. *Both* are human, testifying to the essential ambivalence that features the human relationship with nature—one that includes material and spiritual dimensions, as well as instrumental and non-instrumental uses. At the same time, the emerging global industrial culture, with its emphasis in individual self-fulfillment, social wealth production and consumerism, might seem to involve a great loss of cultural diversity. As Baird Callicott suggests, it is a self-reinforcing process:

Cultural diversity is a reflection of biological diversity and depends on it. The homogenization of the landscape leads to the homogenization of culture, and vice versa (Callicott 1994: 12).

But is that true? Does Modernity involve the disappearance of conservationism or alternative worldviews? Not quite. They just survive under new forms—environmental public policies and movements, as well as alternative and counter-hegemonic cultural codes and practices, together with the mainstreaming of a number of green beliefs and values. It might even be said that the situation has been reversed: whereas in the past formal beliefs tended to forbid nature’s exploitation, but the latter continued to take place, the current hegemonic culture of late modernity legitimizes the human uses (and experiments with) nature, but claims *and* practices that defend the opposite are alive and well. What this apparent paradox suggests is that the human species, rather than different human cultures, may be transhistorically seen as the main unit of adaptation—aggressive adaptation—to the environment. In turn, this opens up the possibility of a nuanced universalism within which room enough is left for a number of particularisms.

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