Chapter 14
Geomorphology and Philosophy: A STEAM Survey of the Anthropocene

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Abstract Many researchers propose that the Anthropocene represents a new division of geological time, positing that our activity by our use of fossil fuels has warmed the planet, raised sea levels, eroded the ozone layer and acidified the oceans. We contend the Anthropocene can only be understood in an interdisciplinary way, integrating ideas from the natural and social sciences with philosophy. That is, by means of STEAM.

Keywords Geoethics · Anthropocene · Kojève · Post-historical epoch · STEAM

The Anthropocene: Contemporary Debate from the Natural Sciences to the Humanities

This chapter considers the new processes of the Anthropocene epoch through the disciplinary lens of geoethics, a sphere in which philosophy, socio-anthropology, geography and the study of geomorphology find confluence. In 2000, Paul Crutzen and Eugene Stoermer of the University of Michigan in Ann Arbor argued that because the industrial agencies of our global population had begun to impact planetary processes themselves, the current geological epoch should be named the Anthropocene (Crutzen and Stoermer 2000, pp. 17–18; Crutzen 2002). The idea inspired many geologists, particularly Zalasiewicz and other members of the Geological Society of London, who were tasked with forming the Anthropocene Working Group to look into the matter (Zalasiewicz et al. 2008). The debate about whether to declare a new geological epoch resurfaced in August 2016 at the International Geological Congress in Cape Town, South Africa. In addition, other scholars are evaluating the issue for the International Commission on Stratigraphy

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(ICS). For an Anthropocene epoch to be added to the official timeline of Earth's history, the backing of the International Commission on Stratigraphy (ICS) will be needed, as well as ratification by the executive committee of the International Union of Geological Sciences (IUGS). The Anthropocene Working Group expects to take 2 or 3 years, at least, to settle on the best golden spike or spikes, the markers for the scientists to point to in millions of years and identify as the geological start of the Anthropocene epoch; the golden spike, in brief, is a physical point in the geological record that shows when one epoch changed to another.

According to Clive Hamilton, the Anthropocene cannot be defined merely by the broadening human impact on nature, which simply extends what humans have been doing for a millennia (Hamilton 2016). The Anthropocene Working Group, which includes Crutzen, initially leaned towards his idea of the Industrial Revolution as its beginning, with other scholars interpreting the Anthropocene as continuing the impact of people on the terrestrial biosphere (Monastersky 2015b, p. 145; Hamilton 2016). As Hamilton indicates, modifying landscape and vegetation may bear the human hallmarks, but these cannot have sufficient impact on the planet to bring about a new geological era. Other scholars argue that the Anthropocene's starting date should depend on when human societies first began to play a decisive role in shaping the Earth's ecosystems (Monastersky 2015b; Hamilton 2016). Also, according to Hamilton, the Anthropocene began when humans changed the functioning of the Earth system (Hamilton 2016). A few scholars include archaeology in the debate, dating the beginning of the Anthropocene to the expansion of agriculture and livestock cultivation more than 5000 years ago or a surge in mining more than 3000 years ago (Ellis 2011). Yet other scholars insist that the Anthropocene is the most recent phase of a process that started 50,000 years ago with human geographic expansion.

In spite of all this scholarly speculation, members of the Anthropocene Working Group have proposed 1945 as the unambiguous point at which people caused a significant shift in the functioning of the Earth system (Zalasiewicz et al. 2014). The first A-bomb test in 1945 contributed to the first stratigraphic presence of radioactive elements in the Earth, and much larger nuclear detonations taking place over the next half century have contributed significantly more (Monastersky 2015a). Other tangible markers of this profound modification may be sought in the alteration of the soil caused by plastic waste, fossil fuel residues, infrastructure and other long-term presence of substances produced by human activity and embedded in the Earth's environment through long-lasting modifications such as the increase in carbon dioxide in the atmosphere (Giorda 2016). Furthermore, in this era known as the 'Great Acceleration', people were increasingly migrating from rural areas to urban centres, feeding the growth of megacities (Monastersky 2015a). These changes put enormous pressure on the environment and the biosphere and underlie the concept of the Anthropocene, literally as 'Man's Epoch'.[1] We are now living in a period in

[1] When we mention 'Man' in this chapter, we mean, as Aristotle said, 'the animal who has language', which is the human capacity to make history, and this is, undoubtedly, a natural datum which distinguishes our species from the others; of course, we don't refer to 'Man' as a male species but to *Homo sapiens*, to human life generally, both female and male.

which our species has become a new geological force capable of impacting the very physical processes of the planet. One of Zalasiewicz's critiques of the Anthropocene as a geological epoch is that compared to other epochs, it is very short, but the Anthropocene Working Group contends that it constitutes such an epoch because many of its changes are irreversible (Carrington 2016).

Therefore, it is not a mere environmental crisis because the term *crisis* refers to something transitional, but we are in a point of no return. Why? Following Bonneuil and Fressoz's reflections, the Anthropocene confronts us with two realities: on the one hand, on the Earth that has existed for 4.5 billion years, life will continue in some form or other and with or without humans. Moreover, even if humans were to drastically reduce their ecological footprint by inventing a sober civilization, the Earth would need hundreds of millions of years to recover the climatic and geo-biological regime of the Holocene. The traces of our urban, industrial, consumer-driven, chemical and nuclear age will remain for millions of years in the geological archives of the planet (Bonneuil and Fressoz 2013).

Consequently, the Anthropocene is not only the subject of contentious debate in the Earth sciences, but it has been appropriated (perhaps uncritically in some instances) by the humanities. However, although much disagreement is engendered by the term Anthropocene, there is a common consensus that it can best be understood through an interdisciplinary approach, by integrating ideas from the natural and social sciences with disciplines in the humanities (Trachtenberg 2016). We therefore advocate a STEAM framework to engage with the challenges of the Anthropocene and seek to mitigate its worst effects. The French sociologist, anthropologist and philosopher Bruno Latour's thesis that Anthropocene is 'the current geological era marked by the impact of human beings on the equilibrium of the planet' was inspired by an article by Richard Monastersky (2015b). The piece, published in the journal *Nature* in 2015, refers to the Anthropocene in terms of climatic, economic, environmental and social changes. His account of disturbing changes occurring from 1950, caused by a huge increase of carbon dioxide production, radioactivity, toxic waste, deforestation and overbuilding, appears to have had a considerable influence on Latour. In a recent essay, Latour positioned the Anthropocene on entirely new foundations and associated the term with social and environmental justice issues in order to design a new geopolitics of recognizing 'planetary boundaries' as political boundaries related to peace processes (Latour 2015). Accordingly, Latour elaborates a notion of politics in a new way, by perceiving the Anthropocene as a 'requiem for the human species' (Hamilton 2010).

Another inseparable aspect of the Anthropocene which pervades the observations of geologists, biologists and researchers in the field of Earth sciences is war. Latour notes that among disasters that have struck the Earth (Gaia), not as a system but as an entity possessing history, war is the 'disaster' par excellence. In this regard, it would then be advisable to try to imagine this epoch, not only as linked to climate change but by practicing a kind of archaeological *epoché* that suspends, at least temporarily, the attribution of the predicates with which we usually define the

Anthropocene. Weapons production and trade that fuel the permanent wars and phenomena like ISIS, the increase of neo-slavery and of irregular migration and the increased gap between wealth and poverty lead to re-situating and redefining the Anthropocene. Therefore, its study encompasses multiple types of phenomena in such a way that only an STEAM interdisciplinary approach can be useful.

The Anthropocene: Geoethical Implications

The principal cause of the Anthropocene is social, rooted in the exceptional capacities of Earth's first ultra-social species: modern humans (Ellis 2016). Therefore, geoethics, a new disciplinary approach which can help us reflect on such issues, now comes into play. Geoethics focuses on how scientists can become more aware of their social responsibilities and how to guide society on matters related to safety in the face of natural hazards, sustainable use of resources and protection of the environment (Peppoloni and Di Capua 2012). Consequently, geoethics is a multidisciplinary approach that encompasses the geosciences, sociology, philosophy, economy and geography. The International Association for Promoting Geoethics (IAPG) has defined the field as 'the research and reflection on those values upon which to base appropriate behaviours and practices where human activities intersect the geosphere' (IAPG 2015). The birth of geoethics occurred when geoscientists became aware of the fact that their activities interfere with and, in some cases, alter in irreversible ways the natural processes of the geosphere. In addition, this field recognizes that scientific choices can have negative consequences on the environment and jeopardize the survival of many species, including humankind (Peppoloni and Di Capua 2015a). By addressing environmental problems at the local and global scale, geoscientists working with social scientists, artists and humanists can help find solutions and ways forward (Peppoloni and Di Capua 2015b). Geoethics encourages a critical analysis of the use and management of natural resources, promoting eco-friendly development; it deals with problems related to the management, communication, education and mitigation of natural risks, by fostering the proper and correct dissemination of the results of scientific studies and information on the risks (Peppoloni et al. 2015). It has been proposed that an ethical pledge similar to the medical 'Hippocratic Oath' be established for geoscientists (Matteucci et al. 2012). In simple terms, geoethics provides guidelines for human behaviour by introducing ethical principles in order to deal with the natural resources of our planet. It guides our use of the Earth's resources for meeting current human needs and their impacts on both environment and society (Limaye 2015). Furthermore, geoethics concerns all the moral questions regarding human impacts on the Earth system (Paal 2015). In addition, Martin Bohle states that our species has acquired the power to engineer planet Earth, be it intentionally, by number, by ignorance or by negligence (Bohle 2015, 2016). Anthropogenic global change is the paradigm of our times and therefore needs to become an explicit part of our value systems (Bohle 2015, 2016). According to Paál (2015), it would be fairly appropriate to state: 'geoethics goes along with the Anthropocene'. More essays are stressing this connection.

Therefore, the Anthropocene requires a sophisticated approach to space, time, knowledge, ethics, politics, social action and, most of all, interactions between human and environmental systems, including the empirical and ontological blurring of these categories (Cook et al. 2015). The processes of Anthropocene can only be understood by integrating the most specific physical and geological field with the human and cultural one.

The Anthropocene: A STEAM Approach

What probably makes Anthropocene a problematic and at the same time a fascinating concept lies in a contradictory statement: Anthropocene could actually reveal the fallacy of anthropocentrism. If the causes of the imminent catastrophe lie in a certain set of human activities, it is obvious that through the *anthropos*, humanity, in general, cannot be considered 'guilty' of poisoning the Earth. As Bruno Latour (2015) pointed out, Anthropocene shakes the very notion of *anthropos*, a universal subject (species, class or multitude) capable of acting as a single people, as a single great individual with its own will. It is as if human society were a collective being that would be the new agent of geohistory, as it happened in the past with the proletariat (Latour 2015).

Latour's hypothesis is that it is absurd to talk about the anthropic origin of global warming, if we consider anthropic as something like human species, without immediately instigating thousands of protests. Even if global warming is anthropogenic in its origin, there is no corresponding 'humanity' that can act under the guise of a single political agent (Chakrabarty 2012). It is not just a question of ethnocentrism, to the extent that it is correlated with anthropocentrism, but rather a question of the exploitation and oppression of the living—that is why the term 'Capitalocene' has also been proposed (Moore 2016; Haraway 2016).

While the term Anthropocene is currently very controversial in geology, since it has to comply with the temporal and stratigraphic limits already mentioned in the previous paragraph, in human and social sciences, however, Anthropocene has worked as a driving force for the development of new research fields which run parallel to the two aspects of the post-human (Marchesini, Haraway, Braidotti), as well as those of the political ecology (starting from Guattari and Gorz) and the Environmental Humanities (Oppermann, Iovino, Holm, Travis, Neimanis, Sörlin) and as a *medium* to strengthen the link between environmental research and socio-political commitment. In addition, the generic reference to *anthropos*, that is to man without distinction, has given rise to a new wave of reflections, theoretical constructions and deconstruction about the relationship between nature and culture, human and non-human, genders, cultures and, more generally, as anticipated, concerning an alleged essence or authenticity of 'man' (Baranzoni et al. 2016). Therefore, the concept of the Anthropocene is an interdisciplinary sharing tool but also a meeting place, milieu or culture broth to create hybridizations between socio-anthropological (Viveiros de Castro, Latour, Avelar), philosophical (Colebrook, Parikka, Stengers,

Stiegler, Szerszynski, Hörl, Haraway, Braidotti) and historical-political perspectives (Chakrabarty, Jason W. Moore).

Anthropocene is presented by some scholars as an event, a point of no return, a 'shock' (Bonneuil and Fressoz 2016). According to Latour, Anthropocene is the most decisive philosophical, religious, anthropological and political concept ever produced as an alternative to ideas of modernity (Latour 2013). Extending the systemic ecology that had included human activities 40 years ago into an analysis of the functioning of ecosystems and biosphere, the idea of Anthropocene represents the dialectical reconciliation between nature and culture, human history and life and Earth history (Bonneuil and Fressoz 2013). It is therefore a change of our relationship with the world.

Anthropocene is political since it implies arbitrating between different human antagonistic forces on the planet, between fingerprints caused by different human groups (classes, nations), from different technical and industrial choices or between different patterns of life or consumption. It is then important to tackle Anthropocene politically to overcome the contradictions and limitations of a model of modernity that has been globalized after two centuries and explore the traces of a rapid and equally divided reduction of ecological footprint of societies (Latour 2015).

The concept of Anthropocene is also fundamental in human geography, whose subject matter is traditionally defined as the set of relationships between man, the environment and society and consequently the study of the changes produced by the processes of interaction between human systems and environmental systems. The introduction of the concept in geographic studies is very recent; Jamie Lorimer's article titled *Multinatural Geographies of the Anthropocene*, published in 2012 on *Progress in Human Geography*, marks an important step in this direction. After noting the end of the concept of nature that has covered the modern era, the article presents the alternative views of environmentalism that focus on the conservation of biodiversity. Through biogeography, these views connect the concept of Anthropocene to the approaches of natural and social sciences (Lorimer 2012). The issue of environmental transformation seems to be able to attract the greatest interest of geographers. Mark Whitehead (2014) places it at the centre of his volume *Environmental Transformations*, subtitled *A Geography of the Anthropocene*, which represents an important attempt to systematize the issue around the themes of resources and life systems. On the one hand, the author presents the state of the situation with respect to the preservation of hydrocarbons, water, air, soil and forests. On the other hand, he observes the role of urbanization and human endeavour to govern environmental change and adapt its approaches to the environment (Whitehead 2014). Three contributions published by Noel Castree (2014a, b, c) on the *Geography Compass* journal, with the aim of exploring the importance of the concept of Anthropocene for the present and the future of geography, should also be explored in order to complete this framework. An additional indication of geography's interest in Anthropocene is the publication in 2015 of a special edition of *Geographical Research* journal. A Symposium of the 2016 Annual Meeting of the Association of American Geographers was devoted to the challenges of

Anthropocene. The 32nd Italian Geographic Congress held in June 2017 also devoted a session to the prospects of Anthropocene and the link with geographic research, geoethics and Environmental Humanities, in which we participated as proponents along with Cristiano Giorda, Paolo Giaccaria and Charles Travis (AGeI 2017). Travis, along with Poul Holm, has published a study on Hannah Arendt's concept of the Polis, detailed in The Human Condition (1958), which addresses the human dimension of climate change (Travis and Holm 2017).

Anthropocene is then linked, on the one hand, to risk perception (De Pascale et al. 2015, 2016, 2017) and environmental limits, with its correlation of emotional and subjective aspects related to the future of humanity; and on the other hand, it is useful to a design component that tries to develop new behavioural responses in the ethical and ecological reorganization of the economy, politics and society (Giorda 2016).

Therefore, there is not only one Anthropocene but many, which overlap and juxtapose in the analysis of researchers who make them their own research object. Or rather, there are only perspectives on the Anthropocene: by maintaining the geographical metaphor that suits the concept of Anthropocene, at least for the time being, only 'cartographies' are possible, factual recognitions that take into account the various positions of the debate while becoming part of it (Baranzoni et al. 2016).

Thinking of Anthropocene requires new Environmental Humanities and a new STEAM approach. It brings the social sciences, the humanities and the natural sciences together in different ways to address the current ecological crises from closely related ethical, cultural, philosophical, political, social and biological perspectives (Oppermann and Iovino 2017). Indeed, this human species that has plunged the planet into the uncertain becoming of Anthropocene is not only a biological entity, but it is also made up of social and ideological systems, of institutions and imagines, of geographies and power relations that hold an irregular distribution of Gaia's benefits and damages, of legitimacy of talking about and for the planet and of possibilities to weigh on technical and economic choices (Bonneuil and Fressoz 2013).

In the next section we analyse the Anthropocene as a symptom of the era we live in, an analysis that contains tropes attributed to the philosophical sphere.

The Anthropocene As a Symptom of the 'Absence of the Future'

The Anthropocene testifies not only to the influence of 'human activity' (Crutzen 2005, p. 54) on the global environment but also provides a prognosis of the fate and destiny of nature itself. Indeed, the irreversible decline, anticipated within such a framing of the Anthropocene, corresponds directly to a 'crisis affecting Man's own being as a political animal' (Crutzen 2005, p. 135). As implied in its subtitle *Man has changed the climate. The Earth enters a new era*, Crutzen's book entitled *Welcome to the Anthropocene!* (2005) concerns research on climate change but elides the problems associated with 'anthropogenic phenomena of this new

geological era' (Crutzen 2005, p. 25). This section of the chapter focuses on a philosophical archaeology that asks: 'What is the Anthropocene? What is it about? Does it define and question Man as a political animal? Which anthropological level, in any decisive way, does it include so that every individual can get involved in it? What makes our species historic?'.

The Future As the Original and Founding Time of History

Starting from the last question, it is worth clarifying the meaning of the term *history* as defined by German philosopher Martin Heidegger. In *Sein und Zeit* (1927), his questions concern the concept of history and, specifically, the conditions that make it possible. He states that 'history has its essential weight neither in what is past nor in the today and its connection with what is past, but in the authentic occurrence of existence that arises from the future of *Da-sein*' (Heidegger 1976 ed., p. 462). It is a particular philosophical position, characterized by the primacy of the *future*, that consists in postulating the future as the original and founding time of history. In this sense, the link between historicity and the future is understood not as chronological future, but as an existential future, that is, a future that should be thought of and understood from the perspective of death in relation with the finite. What is at stake here is a finite temporality. This aspect is clearly stated in the second section of *Sein und Zeit*, precisely in the fifth chapter entitled *Temporality and Historicity*:

> History, as a *Da-sein* way of being, has its roots so essentially in the future that death, as the possibility of *Da-sein* we characterized, throws anticipatory existence back upon its *factical thrownness* […] Authentic being-toward-death, that is, the finitude of temporality, is the concealed ground of the historicity of Da-sein. (Heidegger 1976 ed., p. 462)

Heidegger identifies in the future, in this temporality destined to the end, in what he calls 'being-toward-death', that 'original temporality' that makes our species historic (Heidegger 1976 ed., p. 484). Our species is not only intended to disappear, but it always has a connection with the future as mortality, which means it is constantly connected with the possibility of death.[2] Reflecting on the theme of death, Heidegger suggests that history is a concept that can be summed by four stages:

1. History as deriving from the past
2. History as 'a set of events and effects' taking place in the past, the present and the future
3. History as a body that changes over time and that, distinguishing itself from nature, which moves over time, embraces the events and the fate of men, of human communities and of their culture
4. Finally, history understood as the transmission, be it historiographically recognized or perceived as apparent, although the origin remains obscure

[2] According to Heidegger, death is only a simple refection of authentic dying.

In this manner, History appears as the 'occurrence of the existing *Da-sein* over time', with 'Man being the subject of events', of history. This last thesis poses the following problem: 'To what extent and on the basis of what ontological conditions does historicity belong to the subjectivity of the historical subject as its essential constitution?' (Heidegger 1976 ed., p. 458). The problematic of the 'time of species' as elaborated by Heidegger takes on an aphoristic value in *Sein und Zeit*: 'The analysis of the historicity of *Da-sein* tries to show that this being is not "temporal" because it "stands in history", but that, inversely, it exists and can exist historically only because it is temporal at its core' (Heidegger 1976 ed., p. 452). So, if there is no death, there would be no history, since if something existed eternally, the past, present and future would coincide in static nature.

The Post-historical Epoch and the New Epoch of the Anthropocene

From another perspective, Alexander Kojève asserts bluntly that the 'end of history' announced by Hegel has indeed occurred, defining our epoch as post-historical. Attributing our primacy no longer to the future but to the 'eternal present' typical of an environment, Kojève states that we focus on a kind of vanishing and immemorial temporality, in other words, on a type of society that doesn't need to remember its past or project itself towards the future. Rather it is a new type of animality. Post-historical animals, as defined by Kojève, although they keep dying, no longer have any constant or permanent link with the eventuality or the possibility of an end. Rather, they are immersed in a kind of eternal present, typical of non-human animals, which Augustine of Hippo attributed to God:

> Your years are one day, and your day is not any or every day, but Today (*non cotidie sed hodie*) because your Today does not yield to a tomorrow nor did it follow on a yesterday. Your Today is eternity: Therefore, you generated the Co-eternal to whom you said: "This day, I have begotten you. You created all times and you exist before all times. Nor was there any time when time did not exist". (Augustine of Hippo 2006 ed., p. 557)

This rhetorical game played by Augustine of Hippo (2006, p. 557) concerns the concept of eternity in relation to time, in which he discusses the impossibility of thinking of eternity except as a 'motionless and eternal present' (Augustine of Hippo 2006 ed., p. 397). In Augustine's game, time never ends but exists in a non-temporal eternal present from which the three dimensions of time will arise. To parse Augustine through Kojève's argument is to say that our years are similar to God's years, existing all in a single day, a today without yesterday or tomorrow. Without seeking to address here Kojève's philosophy in toto, it will be sufficient and necessary to stress an important point, specifically within Kojève's book *Introduction to the Reading of Hegel* (1947) in order to explain the existing relationship between the Anthropocene and human nature (Kojève 1996 ed.). Commenting on Hegel's *The phenomenology of spirit* (1807), Kojève stated:

> I realized that the Hegelian-Marxist end of history, far from having been ascertained, was already a present fact. Observing what was taking place around me and reflecting on what had taken place in the world since the Battle of Jena, I realized that Hegel was right to see in this battle the end of History properly so-called. With that battle the vanguard of humanity virtually attained the limit and the aim, that is, the end of Man's historical evolution. (Kojève 1996 ed., p. 541; Hyppolite et al. 1980, p. 273)

In other words, what is realized and manifested in the 'end of history' is the depletion of human potential. Or better, the 'not-yet' becomes and takes the form of a 'here and now' of something contingent.[3] The hiatus, the distances separating the infinite from the finite, shortens to the point where they coincide, a gap which is the central point and a decisive one of the history. Man remains without history, projecting himself to a post-human condition, to a stage of new animality. It is in view of the post-human, of a new animality, that one should reread Crutzen's book, *Welcome to the Anthropocene!*. In other words, what takes place and emerges in this epoch is the depletion of humanity potential, the *anthropos* concept.

Now, we can ask ourselves this question: 'What kind of Man lives in the Anthropocene epoch?' This is an important question that Crutzen does not seem to address. Indeed, the world in which we live is divided and dispersed and deprived of past coordinates. This idea of time, as neither short nor long but as an eternal moment, is also present in Zarathustra:

> The walk backward takes an eternity. And the walk forward takes another eternity. These are two opposite directions; they collide against each other: and it is here, at this gate, that they meet. The gate's name is written up there: 'Moment' […] All truth is crooked; time itself is a circle […] Look—I continued—this moment! A long eternal road that turns runs from this gate: behind us, there is an eternity. Must not all things which can run have run already on this road? Must not everything which can happen, have happened already, been done with, and flowed away? (Nietzsche 1965 ed., pp. 163–164)

This is the illusion that characterizes our epoch, in particular, our sense of the present in the West, and the feeling that the future is closed, that nothing new happens anymore, and every event that happens is the replication or a copy of something that has previously occurred. For this reason, we feel shaken by the world instead of acting upon it. Hence, there is a link between the problem of an epoch characterized by Man's impact on the environment (Anthropocene) and the change of Man's very nature. According to the analysis of Hegel, Heidegger and Kojève, what will disappear is in fact not only history but Man's *ethos*. This Greek term refers to shared practices and customs, a set of habits that foresees a certain degree of variability. It also infers a certain relationship and dialectic between subject and object (norm and application of the norm in Wittgenstein's terms) and between nature and culture. We can state that 'the only habit to survive is that of no longer having solid habits' and witness, thus, the sunset, the decline of human experience, of the *Erfahrung*, the German term for experience in the sense of tradition, of what is transmittable, characterized by social and historical ties. But there is more, of course:

[3] We can also use the following synonyms, *the endless* and *the invariant*, using Chomsky's terms, the *eternal*, *in* Augustine's terms, and the *language faculty*, *in Saussurian jargon.*

> The definitive annihilation of Man properly 'so-called' also means the definitive disappearance of human Discourse (*logos*) in the strict sense. Animals of the species Homo sapiens would react by conditioned reflexes to acoustic signals or mimics**,** and thus their so-called discourses would be like what is supposed to be the 'language of bees'. (Kojève 1996 ed., p. 542)

Nothing is therefore so different from a 'language's instinct', an expression used by Pinker to refer to a type of an innate, natural language, one that doesn't need artifices, that is, a social dimension, a community, not mixed with history. Hence, it is a way of communicating or perceiving, which is not so different from the chirping of birds or from the stimulus-response type, type A produces B, but B reproduces A, that is, a way of behaving which results in a set of automatic and predefined actions, telling us word for word how to act, thus inducing some adhesion of the human animal towards the situations one gradually faces, towards the environment and towards the vital context in which one is requested to act or, better, to react. The language re-environmentalizes becomes again a communication code that is reduced to a simple decoding of the transmitted signals. It is clear then that the idea of an 'end of history' no longer defines only a form of relationship between people based on a certain structure of society but a whole range of existing relations between Man and language, Man and institutions, Man and environment and Man and Man, relationships and relations that are no longer historical or human according to Kojève.

Pulling the Strings

It is now time to ask: 'How do preconceived ideas or opinions and the conditions of possibility change in the Anthropocene epoch? How do subject and object, Man and world, operate now?' We believe that the post-historical animal has a symbiotic relationship with nature and the environment. During the Anthropocene epoch, we witness the manifestations of what are actually the conditions of possibility, the transcendental conditions of historical praxis, in which power takes the form and appearance of the act. These conditions come to light with the new animality.

The theme of new animality is *de vogue*, with recent scholars, such as in the formulation provided in Felice Cimatti's book *Philosophy of the animality* (2013). In this regard, Cimatti identifies in the absolute imminence what Deleuze refers as the real condition of 'becoming animal' of the end of transcendence, of a new human figure with the characteristics of the angel or the infant evoked by Rilke in *Duineser Elegien* (1923). It is at this point that we wonder how is it possible to imagine Man's experience in the Anthropocene, which, according to Cimatti, would be characterized by a state of immanence:

> The world of immanence is a totally new world, a world that is fully here, that aspires to nothing other than to be here, with no "after" or "before," right here. A here that takes a different value as it doesn't project itself either in times that no longer exist or in those that do not yet exist. (Cimatti 2013)

A big aporia that remains, in our view, opens inside the anthropogenic vision of Crutzen.

Conclusion

Based on the foregoing, we can conclude that *history* is considered as 'completed' when 'metahistory', that is, what is subtracted from time, assumes concrete, empirical appearances, reaching a conciliation, an identity of metahistory and history. Furthermore, at the end of this path, we can reassert the relevance of the definition already formulated: reflection on the 'end of history' is not an old refrain, but something current. The idea of 'ending history' was in fact reiterated and deepened in the twentieth century by many scholars, specially by Alexandre Kojève, whom we considered one of the most theoretical radicals of the 'end of history'. He brings, in this way, the Crutzenian anthropogenic vision to extreme consequences and sees, beyond the reflection and formulation of the 'end of history', the relationship between the latter and human nature, between Man and the world in which he is invited to live in.

Contrary to the authors studied, we are firmly convinced that there is no discourse or eternal theory about death, as Heidegger claims in the paragraph that we have analysed, nor on Man as Kojève does, for example, nor on the meaning of history or destiny of the planet as, for example, Crutzen pretends to do, taken up, subsequently, by Zalasiewicz and other scholars such as Steffen et al. (2011) and Bonneuil and Fressoz (2013, 2016).

Claims that are possible only if these categories are considered as the *Da-sein* for Heidegger, or concepts such as history, theories, and categories that are nothing more than *language*, as eternal structures, a priori fixed forever, rather than considering them as *linguistic horizons* neither stable nor eternal, within which the man thrown in, immersed, relates. These are rather temporalized, historically oriented a priori, that is, noneternal a priori. Only in this way can the claim to build an eternal discourse on the meaning of history and its end disappear.

Referring to the discussion on the points of analogy between the authors who have defined *the end of history* and those who support the Anthropocene epoch, we can say that the type of world view of the latter, according to which the planet in which we live has reached a point of saturation, a dead point, or a stalemate situation, so everything has already been done and seen, is not so different from the Kojevian view of history, according to which nothing new would happen in history.

In our view, a different concept of history, world and human nature should be put forward instead; it is then necessary to rethink the relationship between history and metahistory, between time and eternity, between subject and object and between man and the world as two heterogeneous terms in perfect tension between themselves, which coexist with one another without ever reaching a conciliation, an identity.

If we now resume the questions posed at the beginning of the second paragraph—what is Anthropocene? what is it about? does it define and question Man himself as a political animal?—we realize, only now, that they find an answer. Or rather, is it possible to establish an analogy between the 'end of history' and the

'new geological era' analysed by Kojève and Crutzen, respectively? We can say that in neither case is there a need to resort to a metahistorical plan to continue living or rather surviving. With the new geologic era theorized by Crutzen and, in general, by the supporters of the Anthropocene, as well as by the supporters of the end of history, a risk of losing man and, with him, the world in which he lives is highlighted.

This leads some scholars, for example, Bruno Latour, to call upon politics, or a technical system that protects us from the risk of not being present in any possible civil history. In fact, Latour proposes to ecologize instead of modernizing and putting nature into politics through a set of procedures (sometimes scientific and sometimes political) to evaluate the place—irreparably uncertain and controversial—of a multitude of beings in our common world; none of which can serve the simplest means to others (Latour 2012).

Crutzen and Stoermer, on the other hand, propose a worldwide strategy that leads to sustainability of ecosystems and that knows how to use collective intelligence—the noosphere (Vernadsky 1924; Crutzen and Stoermer 2000; Hamilton and Grinevald 2015)—that stems from new ideas and sensitivity towards the environment, landscape and cultural heritage, spreading them globally into a renewed integral ecology that turns into protocols, urban devices and new life cycles: a challenge defined by both scholars as stimulating but difficult and discouraging for the scientific community and the research world.

In addition, promoters of geoethics recognize the contingency of human evolution on the planet (Pievani 2009, 2012), identify *Homo sapiens* as a geological force acting on the geological and biological environments and assign to humans an ethical responsibility that arises from the consciousness of being a modifier of Earth systems (Bobrowsky et al. 2017).

Therefore, if we had to define our epoch, and ourselves within it, we would say that our epoch is erroneously called post-historical or post-modern and we ourselves are mistakenly defined post-historical animals. Our discourse seems to have come to a decisive point: the problem is no longer simply the meaning of the new geological age, of its sense or end, but the most radical one of its own potential that comes from the threshold, from the gap between these two terms, those of end-not end, subject-object, man-world, placing us before it. Probably we don't have to choose between two lines of thought, for example, among those who are in favour of a new geological era and those who are not or among those who support the end of history and those who do not. Rather we need to meditate on the circularity that, indefinitely, uses these two terms interchangeably, and in the repetition of this circle, in its historical possibility, leaving some elliptical displacement to occur: neither a straight line nor a perfect circle.

By echoing Bonneuil and Fressoz's words (2013), living finally means, in the context of the Anthropocene, dwelling in a nonlinear world and unpredictable of Earth's responses, or rather of Earth history, of our perturbations.

We actually think we live, for the first time, in an epoch which allows a complete overlap among geological and geographical categories (e.g. that of the 'Earth system') and certain philosophical concepts (e.g. 'history'), which correspond, respectively, to those of 'nature' and 'culture'. It is, therefore, a plot that would show the

man's relationship with the world, becoming an immediate content of social life in a very specific historical period, namely, that of Anthropocene. From these assumptions we can understand the importance of speaking about this geological era in different degrees and from different points of view, which in turn represent several STEAM cartographies of Anthropocene.

Indeed, if the debate about the Anthropocene temporarily stopped in geomorphology, the concept is present in the contemporary collective imagination, and the impact of human factors on environmental changes is quite intense in the social perception (De Pascale et al. 2015, 2016).

Consequently, documenting, understanding and responding to the present and future challenges posed by the recent changes in the relationship between human beings and their environment thus become an imperative for social sciences and humanities.

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Dr. Valeria Dattilo is the author of the second section which includes the following paragraphs: *Anthropocene as a Symptom of the 'Absence of the Future'*, *The Future as the Original and Founding Time of History*, *The Post-historical Epoch and the New Epoch of the Anthropocene* and *Pulling the Strings*. The conclusions are attributable to both authors.

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