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## GOING (MORE) HISTORICAL On Environment, Science, and Discourse

When it comes to the environmental debate (as it is often the case nowadays) there seems to be a shared feeling that our planet is dancing on the edge of the abyss. The tone typically swings between gloomy and millenarian, and the emotional corollaries in terms of public outcry – fervent pleas to “act before it’s too late” and to “save the planet”, outraged hashtags spreading all over the web, artworks splattered with soup or paint – have become a hallmark of our time.

A caveat is in order. It is clear beyond any doubt that there are many reasons for concern. Global warming, energy crisis, desertification, flooding, overpopulation, hydrogeological instability, pollution, increasing frequency of pandemics, biodiversity loss (just to mention some): a mounting mass of evidence proves the strong relation between human activity and the worsening of environmental issues in the last decades. Only, the main victim of this situation is not “the Earth” or “life” – it is us.

This is not a quibble. I believe that keeping this distinction in mind can help us to gain a better focus on the problem at hand. The extinction of tens or hundreds of thousands of living species (including, potentially, ours) or the uncontrolled rise in global temperature are, of course, alarming signs of a drastic change in the Earth’s ecosystem. Still, this change “destroys” our planet or the life on it no more than a car wash brush would do on the body of an automobile; nor does it confirm humans as the quasi-Mephistophelean beings endowed with limitless destructive power whose description has had such a strong appeal to the environmental debate and to public

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opinion in general – perhaps because, deep down, we like to see ourselves as mightier than we really are. This is a flattering view: so much so that (we might suspect) it offers common ground for the most inflexible eco-activists and the most unrepentant technocrats.

But this is, in fact, just a view, and as such it should be taken with more than a grain of salt. «Gaia» (that is, the Earth and life on it) «is a tough bitch», as the always-brilliant Lynn Margulis used to say,

[...] a system that has worked for over three billion years without people. This planet's surface and its atmosphere and environment will continue to evolve long after people and prejudice are gone.<sup>1</sup>

In a sense, this consideration comes as both a relief and a challenge for us. Whether we like it or not, our planet existed before us and will continue to exist, function, and sustain life even after we are long gone. It is still functioning *with* us, too – although, we must concede, with non-optimal side effects for many of our fellow occupants. But this is no novelty in Earth's history after all.

In short, the ongoing environmental crisis is something that should urge us to act not to “save the planet” or “life”, but – in a more humble and concrete view – to save ourselves in the first place. And indeed, any claim that the commitment to save “life” on the Earth should override the commitment to preserve *our* species is not just wrong from an ethical perspective but also bound to fail the test of public opinion: which in the end would go to the very detriment of the (commendable) goal of protecting biodiversity.

In order to save ourselves, however, we must first sharpen our understanding of how and to what extent we impact the environment we live in. And even more so, since this impact has now become so deep and widespread that it affects many processes in the Earth system. Actually, human activity is leaving a trace even in the stratigraphic record. Hence the proposal of grouping the last decades of the Earth's history into a new chronostratigraphic unit ranked as a geological epoch: the *Anthropocene*, an idea that is becoming more and more popular in the public debate as well as among experts.<sup>2</sup>

1 L. Margulis, *Gaia is a tough bitch*, in J. Brockman (ed.), *The Third Culture: Beyond the Scientific Revolution*, Simon & Schuster, New York 1995, pp. 129-151 ([https://www.edge.org/conversation/lynn\\_margulis-chapter-7-gaia-is-a-tough-bitch](https://www.edge.org/conversation/lynn_margulis-chapter-7-gaia-is-a-tough-bitch)).

2 On this topic, see <http://quaternary.stratigraphy.org/working-groups/anthropocene/>.

This proposal is still under scrutiny, which is no simple task for the scientific and scholarly community.<sup>3</sup> Establishing a new geological epoch where humans and their activity are at the same time *subject* and *object* of investigation entails an interdisciplinary effort which, in turn, raises epistemological and methodological concerns. From a stratigraphic point of view, for example, a geological epoch of only a few decades (or centuries, depending on the more or less restrictive interpretations) is hardly definable and justifiable. Out of comparison, what is currently the most recent and by far the shortest epoch in geochronology – Holocene – began around 12,000 years before present, the timespan of the other epochs ranging from hundreds of thousands to tens of millions of years. This fact can explain in part why a relevant number of geologists still express skepticism on the validity of the Anthropocene as a new formal stratigraphic unit.<sup>4</sup>

As a paradoxical side-effect of this “technical fuzziness”,<sup>5</sup> many of the loudest voices in the debate on the Anthropocene tend to be as ideological and polarized as they are scientifically incompetent, and, all things considered, not really interested in addressing the environmental problem. This serious flaw is also noticeable in a lot of general discussions on the environment: setting aside the rhetorical overuse of moralistic and apocalyptic tones, far too often the debaters seem to focus less on examining facts and arguments than on spotting some stereotypical and easily identifiable villain to blame “for what is going on” (fossil fuels, lobbies, high

3 See, for example: <http://quaternary.stratigraphy.org/working-groups/anthropocene/>; <https://www.anthropocene-curriculum.org/>; <https://www.mpiwg-berlin.mpg.de/project/knowledge-anthropocene>.

4 I mention only a few titles from the vast literature on the subject: P. Brannen, *The Anthropocene is a Joke*, «The Atlantic», August 13, 2019 (<https://www.theatlantic.com/science/archive/2019/08/arrogance-anthropocene/595795/>); B. Clarke, “*The Anthropocene*,” or; *Gaia Shrugs*, «Journal of Contemporary Archaeology», vol. 1, n. 1, 2014, pp. 101-104; P.L. Gibbard, M.J.C. Walker, *The Term “Anthropocene” in the Context of Formal Geological Classification*, in C.N. Waters, J.A. Zalasiewicz, M. Williams, M. Ellis, A.M. Snelling (eds.), *A Stratigraphical Basis for the Anthropocene*, Geological Society, London 2014, pp. 29-37; P.L. Gibbard, M.J.C. Walker, A.M. Bauer, M. Edgeworth, L.E. Edwards, E.C. Ellis, S.C. Finney, J.L. Gill, M. Maslin, D. Merritts, W.F. Ruddiman, *The Anthropocene as an event, not an epoch*, «Journal of Quaternary Science», vol. 37, n. 3, 2022, pp. 395-399; C. Santana, *Waiting for the Anthropocene*, «The British Journal for the Philosophy of Science», vol. 70, n. 4, 2019, pp. 1073-1096; G. Visconti, *Anthropocene: another academic invention?* «Rendiconti Lincei. Scienze Fisiche e Naturali», vol. 25, 2014, pp. 381-392.

5 For further considerations on this, see <https://www.anthropocene-curriculum.org/anthropogenic-markers/page/amd-editorial-introduction>.

finance, technocracy, politics, patriarchy, colonialism, anthropocentrism, the never-failing human arrogance and human greed, science itself), no matter how simplistic the answers to such complex problems. Far from being productive, this divisive approach has severe negative effects on public perception. It intensifies polarization and, eventually, boredom and apathy towards the environmental issue, much to the advantage of the paid advocates of climate change skepticism.

To complicate things further, prejudices abound also on the “technical” front. Following the argument that the management of environmental problems requires exclusively scientific knowledge and skills, for example, there is a very common and stubborn bias among scientists that the debate on the Anthropocene – and the environmental debate in general – should not involve the humanities. But this approach is bound to fail as well, and for two closely related reasons: 1) the sharp distinction between scientific and humanistic knowledge is but an ideological and epistemological preconception (although, unfortunately, this preconception has plenty of supporters from both sides); and 2) the notion of the Anthropocene is based on the assumption that humankind, including human culture, acts as a geological force.<sup>6</sup> Therefore, it is only through an interdisciplinary method that we can identify the roots of this proposed epoch, understand these roots in all their complexity, and find possible solutions to the environmental challenges that we are facing.

The importance of interdisciplinarity for better understanding ourselves and the world around us is no novelty. Still, such importance is even more relevant when discussing the Anthropocene, for the very definition of this proposed epoch entails that natural and human history should be studied together if we want to know them. This, in turn, means that the epistemological and methodological toolkits of the sciences and the humanities should interact as well, and in a most profound and concrete way.

“Profound” and “concrete” interaction means something different than a mere *dialogue* as it is generally understood today: hardly more, in most cases, than certain “interdisciplinary” conferences where specialists talk about their work and nobody really dialogues. In doing so, these disciplines act as if they were a lot of straight parallel lines, when in fact they need to stretch beyond the lazy comfort of a polite (but superficial) interest in each other. Actually, they must *confront*, and even *compete with*, each other.

<sup>6</sup> On this point, see L.A. Rickards, *Metaphor and the Anthropocene: Presenting Humans as a Geological Force*, «Geographical Research», vol. 53, n. 3, 2015, pp. 280-287.

They must point out their respective epistemological and methodological flaws, discuss them, and overcome them together so that they can strengthen themselves reciprocally. In other words, the concept of Anthropocene challenges us to pursue a unified knowledge in a most genuine humanistic sense: a collective effort that is free from prejudices and where scientists and scholars from different fields can teach something and learn something new in return. A much harder (*unified* does not mean *simplified!*), but much more useful, effort.<sup>7</sup>

What said thus far helps to explain why, when dealing with the debate on the Anthropocene, both the history of science and environmental history have a lot to say. And we would do well to listen to them: not only because the analysis of the human-environment relationship is crucial to both fields, but also because their research methods are equally interdisciplinary (or at least they should be). It is obviously impossible to study the evolution of a given scientific discipline or debate without possessing at least a reasonably specific knowledge in that field (unless the intention is to talk nonsense). But even through science alone it is impossible to succeed completely, no matter how cutting-edge the tools: for it is by means of the critical eye of history that we can see how much our knowledge (science included) is contingent, mutable, influenced by external factors, and in the end, far less unbiased than we like to think. And in fact, it is through this awareness that science can improve itself.

Keeping these two facets of human knowledge together is a challenge, since both these facets have now become enormously complex. Science itself as we know it today is (at least) a centuries-old enterprise, nor are the humanities the same as they were in the early Renaissance. Many new branches, sub-branches, offshoots have sprouted from the trunk, to the point that in most cases a life of study is barely enough to explore a twig or two. Indeed, sometimes we don't even venture beyond our leaf, and so we end up thinking that this leaf is the entire world and lose sight of the one great tree we are all perched on. And yet, remembering our common intellectual ancestry allows us to reach much further – and deeper – in our understanding of nature and ourselves.

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7 See, for example, G. Dürbeck, P. Hüpkes (eds.), *The Anthropocenic Turn: The Interplay between Disciplinary and Interdisciplinary Responses to a New Age*, Routledge, New York 2020; M. Edgeworth (ed.), *Forum on Archaeology of the Anthropocene*, «Journal of Contemporary Archaeology», vol. 1, n. 1, 2014, pp. 73-132; J. Renn, *The Evolution of Knowledge: Rethinking Science for the Anthropocene*, Princeton University Press, Princeton 2020.

Let us consider the history of mining industry for instance, which is one of the most iconic and controversial expressions of the human-environment relationship. In approaching this subject and its immense ecological, economic, political and social implications, we must combine geological knowledge with natural and human history.<sup>8</sup> The mineralogical and petrographic features of a region; its cultural, technological, and economic circumstances; the succession of intertwining events such as natural disasters, climatic fluctuations, political (in)stability, warfare, commerce: these and many other factors demand consideration, all of them being relevant to our analysis.

But *how* relevant exactly? Of course, dealing with this tangle has its pitfalls. It takes attention (and patience) to measure the weight of every ingredient in the mix. It takes geological and historical knowledge – and collaboration too: especially when the mix is so complex that one specialist just cannot handle it all, for the study of sources and theories is as indispensable as it is the study of geological and technological contexts. Once this difficult step is made, however, we discover that the reward is greater than the effort, not only in terms of new data but also in terms of methodological innovation. Think, for example, of one of the purest forms of this interdisciplinary and collaborative approach, the experimental history of science; and how much our understanding of the past (and the present) has profited from the replication of laboratory practices and field explorations.<sup>9</sup>

8 On this topic, see T. Asmussen, *Wild men in Braunschweig: Economies of hope and fear in early modern mining*, «Renaissance Studies», vol. 34, n. 1, 2019, pp. 31-56; Ead., *Spirited metals and the oeconomy of resources in early modern European mining*, «Earth Sciences History», vol. 39, n. 2, 2020, pp. 371-388; T. Asmussen, P. Long, *The cultural and material worlds of mining in early modern Europe*, «Renaissance Studies», vol. 34, n. 1, 2020, pp. 8-30; F. Luzzini, *Sounding the depths of providence: Mineral (re)generation and human-environment interaction in the early modern period*, «Earth Sciences History», vol. 39, n. 2, 2020, pp. 389-408; J. Norris, *The providence of mineral generation in the sermons of Johann Mathesius (1504-1565)*, in M. Kölbl-Ebert (ed.), *Geology and Religion: A History of Harmony and Hostility*, Geological Society, London 2009, pp. 37-40; Id., *Mining and metallogenesis in Bohemia during the sixteenth century*, in Ivo Purš, Vladimir Karpenko (eds.), *Alchemy and Rudolf II: Exploring the Secrets of Nature in Central Europe in the 16th and 17th Centuries*, Artefactum, Prague 2016, pp. 657-670. With particular regard to the 20<sup>th</sup> century, see – for example – D. Zampieri, *La valle dal cuore di Perla. Sulle orme di Giovanni Arduino nelle cave di marmo della Val Posina*, CLEUP, Padua 2022.

9 For some examples of experimental history of science (and for some considerations on the importance of this practice to historical research and science as

In becoming more aware of our natural *and* human past, therefore, we can contribute to the debate on the Anthropocene and to the broader environmental discussion with a contextualizing perspective that is, at the same time, more historically and scientifically conscious and less biased and fragmentary. And this consciousness, in turn, provides a much more fertile ground for the discovery of new paths that can lead us to address (and, let us hope, resolve) the environmental challenge.

As hinted, engaging public opinion is a key factor in increasing the chances of success of this new approach. What is more, learning *how* to do that could also enlighten us on the shortcomings that hinder the environmental debate nowadays – and on the reasons why those shortcomings should and could be overcome. Again, both the history of science and environmental history can be of immense help in this regard: not only in order to promote environmental awareness, but also (and, perhaps, more importantly) to foster and reinforce a sense of territorial belonging. Despite its importance, this is a fairly neglected aspect of the environmental discourse. And yet, involvement and understanding always precede commitment, and talking about the environment is not just talking about nature. It means talking about culture and history, too: *local* culture and *local* history if necessary. It means becoming more aware of roots which, if rediscovered and valued, would also be appreciated and protected.<sup>10</sup>

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well): H. Fors, L.M. Principe, H.O. Sibum, *From the library to the laboratory and back again: Experiment as a tool for historians of science*, «Ambix», vol. 63, n. 2, 2016, pp. 85-97; F. Luzzini, *Theory, Practice, and Nature In-between: Antonio Vallisneri's Primi Itineris Specimen*, Edition Open Access, Berlin 2018, pp. 29-50, 53, 120, 195; W.R. Newman, L.M. Principe, *Alchemy Tried in the Fire: Starkey, Boyle, and the Fate of Helmontian Chymistry*, University of Chicago Press, Chicago 2002; J. Rampling, *English alchemy before Newton: An experimental history*, «Circumscribere», vol. 18, n. 1, 2016, pp. 1-11; O. Sibum, *Experimental history of science*, in S. Lindqvist (ed.), *Museums of Modern Science: Nobel Symposium 112*, Science History Publications, Canton (MD) 2000, pp. 77-86; D. Zampieri, *op. cit.*, pp. 67-160.

- 10 An emblematic case study in this regard is the Venice Lagoon. See C. Baldacci, S. Bassi, L. De Capitani, P.D. omodeo (eds.), *Venice and the Anthropocene: An Ecocritical Guide*, Wetlands Books, Venice 2022. Also, it is worth mentioning the research program promoted by Ca' Foscari University of Venice and MPIWG Berlin with the Max Planck Partner Group *The Water City* (<https://pric.unive.it/projects/the-water-city/home>) and the interdisciplinary studies promoted at the New Institute Centre for Environmental Humanities (NICHE) at Ca' Foscari University, in cooperation with the UNESCO Chair "Water, Heritage and Sustainable Development" (<https://www.unive.it/pag/44234/>).

These roots don't always have to be beautiful. In many cases, what at first glance is "lesser", ugly, or even harmful (think of the countless abandoned caves, mining sites, industrial buildings with their legacies of pollution and damage) turns out to be a crucial resource for our understanding of the environmental and human past of a region. Indeed, sometimes these very sites are the best testimonies to the tormented evolution of our relationship with the environment – and as such, they can teach us a lot on how this relationship can be improved.

We can understand, therefore, why caring about ourselves as humans also means caring about nature. And we also understand why, even before insisting on environmental protection, we need to make sure that the environment is known and appreciated in its historical complexity. Unfortunately, this order of priority seems to clash with the dominant narrative surrounding the environmental debate in these days, a narrative that pits the idea of a victimized, scarred, *good* Earth against a humankind that is corrupt, corrupting, *anthropocentric* (as if it were a fault!).

It is time for us to move beyond this misconception about nature and ourselves. It will not be easy of course: but we need to accept this challenge if we want find a way out of an interpretation of the human-environment system that does not allow for a real collective appreciation of our past – and, therefore, prevents us from learning from our errors.