

Anthropocene

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Introduction

The chemist Paul Crutzen and the biologist Eugene Stoermer coined, or better revived,¹ the term Anthropocene in the early 2000s (Crutzen and Stoermer, 2000; Crutzen, 2002). The notion has since met with growing success, and controversy. Discussion has reached beyond the earth and life sciences involving philosophy, the social sciences and the humanities – and the media as well. From a scientific issue the Anthropocene has become a keyword, or catchword, of broad public appeal. The question is why, and with what implications.

The idea advanced by Crutzen and Stoermer is that human action should be considered on a par with geological forces, as it affects the (remarkably stable) climatic conditions – the Holocene era – established at the end of the last glaciation, conventionally placed 11,700 years ago. The scientific issue is therefore whether the modifications in the chemical composition of the atmosphere, in particular the levels of carbon dioxide, the traces of radioactive fallout from nuclear experiments, the presence in sediments of seeds and pollens of cultivated plants or of bones of bred animals, and other evidences of human environmental impact are enough to justify the claim that the Holocene has been replaced by a new geological era; and, if that is the case, when such era has begun. To find an answer the International Commission on Stratigraphy (ICS) has launched a research programme in 2009, yet to date, neither the ICS nor the International Union of Geological Sciences (IUGS) has officially approved the term Anthropocene as a subdivision of geologic time. Regardless of this, the argument has gained growing traction. For many specialists, human action – which includes ‘the development of diverse products, including antibiotics, pesticides, and novel genetically engineered organisms, alongside the movement of species to new habitats, intense harvesting and the selective pressure of higher air temperatures resulting from greenhouse gas emissions’ (Lewis and Maslin, 2015: 172) – can actually be regarded as the most relevant evolutionary force in the Earth’s dynamics since the onset of the Holocene.

So far so good. Problem is that the Anthropocene has become much more than a scientific issue. As climate change and other global environmental threats like

biodiversity loss, ocean acidification and the proliferation and global dispersion of materials such as concrete and plastics have gained growing public attention, instigating major mobilizations like Fridays for Future and Extinction Rebellion, the social and political implications of the acknowledgement of the existence of the Anthropocene and of its dating have become a field of heated discussions. While specialists point to reach an agreement, first of all about the legitimacy of talking of the Anthropocene, the broader debate seems to expand on the terms of disagreement, first of all about dating. This, as we shall see, depends on how dating the Anthropocene affects the allocation of responsibilities for ecological problems, the calls for intervention and the type of actions deemed sensible. Said differently, when addressing the Anthropocene issue scholars in the natural and in the social sciences and humanities – and ostensibly the public at large – have different preoccupations and goals (Nichols and Gogineni, 2018).

A preliminary question, however, is whether the connection between scientific and social-political debates is to be seen as just one-way. In the traditional account, science ‘proceeds’, questions arising and answers being found according to research, and society ‘responds’ to such advancements. Yet, for the science historian Fleck (1979) there is a close connection between scientific work and social milieu. The latter affects to various extents which scientific issues gain saliency in a given historical period, and the way they are formulated. Likewise, Foucault (2000) talks of ‘problematization’ to refer to a ruling framework of meaning that, in a certain historical moment, allows for certain types of questions to arise and certain types of answers to become thinkable. This means that contrasting positions may share a deep-seated affinity. To make one example, those who call for more technology as a solution to the ecological crisis, such as the ecomodernists (see later), and those who call for a return to ‘simpler’ ways of living, such as Degrowth scholarship (see later, again), take generally for granted the rationale of science and technology that established itself in modernity, especially since the late eighteenth century, as if it was a necessary rather than a historically contingent development, making the possibility of alternative takes on the biophysical world – which the likes of Theodor W. Adorno and Walter Benjamin regard as entirely sensible, and indeed crucial (again, see later) – to appear an empty question.

Yet, if in the Anthropocene debate scientific and social-political questions are entangled together, we may be confronted with neither a pure scientific issue nor a mere political one, but rather with a governmental apparatus (*dispositif*) in Foucault’s sense: a juncture of expert knowledges, veridictive procedures, institutional arrangements and political strategies that allow for governing conducts in a particular way. The discussion that follows explores this hypothesis. I start with accounting for the debate over the dating of the Anthropocene and its political implications. I then show that divergent standpoints end up with a similar recipe. To make sense of that I reflect on the emergent ontology of reality and agency, as differing from both modern naturalism and post-modern culturalism, and being shared by both theoretical debates and governmental practices. Finally,

I ask whether and how it may be possible to escape from the ruling problematization of the Anthropocene, arguing that insights from scholars like Benjamin and Adorno are precious and ongoing ‘prefigurative’ practices are worthy of careful consideration.

Dating the Anthropocene

As hinted, outside specialized debates in the earth and life sciences the issue of dating has gained special relevance, for its political implications. Four main narratives can be distinguished, according to the factual elements stressed and the normative conclusions drawn.

The first narrative is that the Anthropocene starts about 10,000 years ago with the beginning of agriculture, that is, of humans’ systematic transformation of their biophysical milieu. The Anthropocene, in other words, corresponds to the affirmation of the human species. The political implication of this case is that one can hardly do anything about the Anthropocene, however dire the present ecological situation may be, apart from embracing it, enhancing our ability to transform the environment. We have to point to a full-fledged ‘stewardship’ of the planet, increasing technical efficiency in the use of resources and possibly handling climate dynamics by way of ‘geoengineering’ techniques such as carbon capture and storage or solar radiation management (Keith, 2013). The thesis of a planetary stewardship has been advanced, among the others, by the very proponents of the Anthropocene concept (Crutzen and Schwägerl, 2011) and by so-called ‘Ecomodernists’. In the Ecomodernist Manifesto – a text undersigned by a group of scholars of different disciplinary provenance (Breakthrough Institute, 2015) – one reads that farming, energy extraction, forestry, settlement and other activities must be intensified via ever-more powerful technologies, as spurred by capitalist competitive dynamics, pointing to a ‘decoupling’ of society from the biophysical world, in the sense of making the nature/society interface ever-more technologically mediated, hence rendering society increasingly independent from the vagaries and limitations of nature. In this ‘good Anthropocene’ technology will prevent ecological crises while ensuring that growth proceeds undeterred, with elements of ‘pristine’ nature possibly spared for aesthetic or spiritual reasons.

A second narrative locates the Anthropocene in the age of the great travels, colonies and plantations; a process which, according to some scholars, was of no lesser, and possibly greater, importance than land enclosures in triggering the onset of capitalism. Though the long-term result of worldwide colonization and trade would be a massive intensification of resource extraction and an erosion of biodiversity, its initial effects were a wide-scale swapping of species between continents and a decline in atmospheric carbon dioxide levels. Evidence of a major dip has been detected in core samples of Antarctic ice datable around 1610, arguably caused by the extermination of around 50 million people (mostly farmers) as a result of warfare, enslavement and infectious diseases entailed by the colonization of the New World, with ensuing growth of forests and sucking of carbon dioxide

out of the atmosphere (Lewis and Maslin, 2015). The political implication of this argument is that, more than with the human species, the Anthropocene has to do with capitalism as a world economy (Wallerstein, 1979), or, more appropriately, a world ecology (Moore, 2015), as accumulation crucially depends on expanding the frontier of commodification by appropriating and putting to work allegedly valueless raw material: land, energy, food, labour (slave and reproductive). In this view, tackling the Anthropocene means tackling – getting off – capitalism and coloniality. The latter has to be understood not as a historically circumscribed phenomenon but as a systematic devaluation and subjection of peoples and places (Go, 2016) that becomes especially important whenever capitalism faces a crisis of realization of value; whenever, in other words, the accumulation mechanism finds a limit in the established organization of the means of production. Supporters of this narrative have therefore proposed notions alternative to Anthropocene, such as Capitalocene (Malm, 2016; Moore, 2015) or Plantationocene (Haraway, 2015), to stress how ecological impacts are not a destiny of the human species but a matter of social and more-than-social domination, which urges a move in the direction of environmental justice. The very positing of the Anthropocene as a universal humanitarian issue, it is noted, is instrumental to depoliticizing ecological threats, presenting the ruling order as beyond dispute (Swyngedouw, 2010).

A third narrative is that the Anthropocene begins with industrialization and the burning of fossil fuels. Crutzen (2002) himself has suggested that the new era begins in the late eighteenth century, in coincidence with the introduction of James Watt's steam engine. Even scholars who stress how the Anthropocene can be narrated in different ways, according to the selected historical thread, indicate this period as the starting point of the story (Bonneuil and Fressoz, 2016). Of course, the industrial revolution should not be seen as a mere matter of technical advancement, being intimately related with capitalism. Namely, there is a core relationship between the capitalist notion of labour as an abstract capacity to deliver a result (the average, or 'socially necessary', labour time to produce a commodity, to borrow Marx's terminology) and the development of the thermodynamic notion of energy.

Prior to its emergence in thermodynamics, energy did not have a strong association with fuel, nor a scientific definition. . . . Energy became tightly bound by the governing logic of work, [while] work increasingly came to be governed through the metaphors and physics of energy.

(Daggett, 2019: 3–4)

Thermodynamic theorists like Watt, Carnot, Thomson and Joule 'organized their new concept of "energy" around the emerging idea of industrial labour, especially how to control it and maximize its benefits for factory owners' (Lohmann and Hildyard, 2014: 28). Energy – namely, fossil energy² – and labour came to be seen as flows of equivalences that can be composed, decomposed, moved freely in space and time, just like money. Marx's notion of 'labour power' builds on

this very assumption, and current physics textbook definitions describe work as the application of energy and energy as the capacity of a physical system to do work. This circularity or fluidity between nature and culture, metaphor and reality, abstract and concrete, is what allowed capitalism, quite literally, to ‘put the world to work’ (Daggett, 2019: 12). So, capitalism is certainly relevant to this account of the beginning of the Anthropocene. However, compared with the one formerly described, there is a shift in focus: at the centre of attention lies fossil fuel-based technology (e.g., Malm, 2016). The key call, thus, is for reorienting industrialization, replacing as much and as quickly as possible fossil energy with ‘clean’ and ‘renewable’ one. A stress on technological solutions to the ecological crisis is thus what this narrative shares with the first one. Whether technical advancement should occur within, and by way of, capitalist relations or entails an exit from capitalism, is instead a matter of contention. Ecomodernists, as said, firmly believe in the virtues of capitalism. ‘Accelerationists’, on the other hand, build on a Marxian imagery of traversing capitalism to overcome it, making a case for ‘speeding up’ capitalist dynamics of innovation up to the point where capitalist relations will prove to hamper further advancement, being wiped out as a result (Srnicsek and Williams, 2015). In this account, thus, change in the means of production is deemed conducive to change in the relations of production. Both ecomodernists and accelerationists, however, concur that a transition to a good Anthropocene is compatible with, and even demands, a relentless expansion in the transformation of the biophysical world. This ‘productivist’ position clashes with the view of other people concerned with the ecological crisis, such as Degrowth scholars and activists. Yet the case for Degrowth does not build so much on a critique of modern science and technology, as on a downsizing of throughput based first and foremost on a cultural shift, away from competition and the lure of consumption and towards conviviality and self-limitation (Latouche, 2010; Kallis, 2019).

The fourth narrative about the Anthropocene is that the beginning of the new epoch is to be located in the mid-twentieth century, with the ‘Great Acceleration’ – technological, industrial and demographic – that followed World War II. There is actually major empirical evidence in support of this claim. The rise in the environmental impact of human activities in the last decades has been impressive, with ever-intensifying use of chemicals in agriculture, greenhouse gases emissions of industries, rampant urbanization and infrastructure construction, to say nothing of radioactive debris embedded in sediments and glacial ice (Steffen et al., 2015). Strikingly, the process has proceeded at a growing pace well after climate change was recognized as a major issue. For example, half of the emissions of the companies involved in the extraction, refinement and sale of fossil fuels have been released since 1986 (Rich, 2019; see also Heede, 2014). The case for a coincidence between the Anthropocene and the Great Acceleration is therefore strongly advocated by specialists in stratigraphy (Subramanian, 2019). Yet, its political implications do not seem to differ dramatically from those already described, where the Anthropocene is basically acknowledged as a matter of fact and the question is rather whether and how – with what distribution of loads to achieve what type

of societal arrangement – it is possible to actualize a ‘good’ version of it. There is however an emphasis on the most recent phase of capitalism: the triumph and crisis of Fordism, the advent of post-Fordism and globalization (largely as a result of neoliberal reforms), and the third (IT and biology-based) industrial revolution. Much depends, therefore, on the extent to which the current phase of capitalism as an ‘institutionalised social order’ (Fraser, 2014) is felt to differ from previous ones. Some, for example, stress a major rearrangement of the political conflict occurred in recent times, the left/right cleavage losing relevance compared with the distribution of the risks and opportunities of globalization (Azmanova, 2020). Yet one has to consider also the novel take on reality that, as we shall see, characterizes late capitalism. Both aspects gain relevance in making sense of the debate described so far.

Making sense of the debate

Evidence that traditional lines of division are losing their discriminating capacity emerges quite clearly from the preceding account. The positions described, in fact, do not seem to align with well-proven oppositions, such as between capitalism and anticapitalism or between modernism and antimodernism. Ecomodernists and Accelerationists agree on the need to intensify technical innovation to get out of the dependence on nature and therefore to further enhance the Anthropocene, just as advocates of Degrowth, despite the sarcasm of detractors about their case for a ‘happy downsizing’, do not adhere to the antimodernist positions of some fringes of traditional ecologism, pursuing instead the line of an intensification of the process of individualization – the quintessence of the modern – through an ever-greater self-control and self-determination. In other words, despite the diversity of positions, Ecomodernists, Accelerationists and even Degrowth scholars make sense of the present in a fairly similar way.

It may well be, therefore, that the conflict over dating, whatever its political implications, obscures another issue: namely, the performativity of the very notion of the Anthropocene; what its acceptance, and to some extent even its rejection, entails. We have seen that for many the issue is not whether the Anthropocene exists, but how to enact a ‘good’, ecologically sustainable, version of it. Ecomodernists believe that becoming aware of the role – or the destiny – of humans as makers of their own world is preliminary to moving at a growing pace towards a technological future where the ‘planetary boundaries’ (Rockström et al., 2009) – defined by essential Earth system dynamics involving biodiversity, biogeochemical processes and concentration of chemicals, atmospheric and ocean composition, use of land and freshwater – will be virtually expanded through increasing resource efficiency. Perhaps expanded even materially: for example, as noted already, via geoengineering; but also via ‘human enhancement’ technologies (including human–machine interfaces), capable of making the body more resistant to adverse climate conditions (Buchanan, 2011). The overall case here is for conceiving of a ‘post-natural’ sustainability (Arias-Maldonado, 2013),

understood as leverage over a fully plastic materiality open to endless (benign) transformations. This view is basically shared by Accelerationists, even though the latter insist especially on automation (Srniczek and Williams, 2015).

That traditional lines of political division do not show a major discriminating capacity regarding the views on the Anthropocene is confirmed by other data. Consider the position taken by Dipesh Chakrabarty, a historian known internationally for his contributions to postcolonial studies and therefore not suspected of sympathy for capitalist globalization. For Chakrabarty, the advent of the Anthropocene concerns humanity as a species which, in the face of the climate crisis, is subject to a shared vulnerability and charged with a common responsibility. This, he claims, determines ‘the collapse of the age-old humanist distinction between natural history and human history’ (Chakrabarty, 2009: 201); which does not mean denying the latter but recognizing that the Anthropocene is a fact that changes profoundly the relationship between humanity and the planet, thus the reading of human affairs. The position expressed by Chakrabarty (and many others) has been sharply criticized from different standpoints. Authors writing from a postcolonial or decolonial perspective claim that the case for the Anthropocene and the geological knowledge and lexicon on which it builds express colonial and racialized concerns about damages that are today threatening white liberal communities but to which extractive economies have exposed for long time marginal, ‘valueless’ peoples and places, and for addressing which without touching existing power relations a phantom ‘we’ is evoked (Yusoff, 2018). Marxist-oriented authors likewise contend that claims about the human species prevent attributing differentiated responsibilities for climate change and commensurate burdens for mitigation or adaptation (Malm and Hornborg, 2014; Malm, 2019).

A criticism of ‘oversimplification’, however, may be addressed to Marxist positions as well. According to Moore (2015, 2016), ‘cheap nature’ is by now virtually exhausted, engendering a terminal crisis of capitalism or at least a crisis of a novel type. This diagnosis does not seem to adequately take into account some important issues. One is the intensification of the ‘real subsumption’ of nature – an expression some scholars use by analogy with Marx’s notion of real subsumption of labour – made possible by new genetic biotechnologies. To recall the point, Marx defines real subsumption of labour the situation, typical of the Taylorist factory, where workers become cogs in the assembly line, their contribution to production being reduced to mere bodily-psycho energy. This contrasts with the formal subsumption of labour occurring in early industrialization, where workers entered a wage relation with capital while retaining their own skills, hence a creative control over the labour process. So, nature can be said to be subsumed ‘formally’ when capital exploits resources by adjusting to their own features (as with mineral, oil or coal extraction and the inanimate world in general), and ‘really’ when the living world is ‘(re)made to work harder, faster and better’ (Boyd et al., 2001: 564) in order to enhance accumulation. The point, then, is that the capacity for a real subsumption of nature has changed dramatically. Traditional agricultural practices found limits in the need of a cross-breeding of whole organisms, which

was possible, and not always working, only between very similar species. These limits are overcome by the capacity of transferring single genetic traits, identified as carriers of specific, valuable functions, from one type of organism to another.³ This far greater technological power can hardly be dismissed, as it discloses the possibility of a potentially unlimited (or at least much deeper) real subsumption of living matter, making the end of cheap nature more uncertain than Moore claims.

Another noteworthy issue in this respect is the expansion of the economy of 'ecosystem services'. These are defined as the benefits biophysical systems give to humans, from resource provision to regulative and supporting functions like carbon sequestration, waste decomposition, soil formation, crop pollination (Millennium Ecosystem Assessment, 2005). Crucial to the realization of transactions concerning these services is a functional abstraction whereby 'classifiable similarities between otherwise distinct entities [are identified] as if the former can be separated out from the latter unproblematically' (Castree, 2003: 281). The intriguing aspect in this is that a portion of nature seems to become a commodity not through human labour, a transformative work over it, but through a mere symbolic gesture, a cognitive interpretation, or, if one wishes, an ontological redefinition. Of course agronomists, economists and other specialists involved in the identification and evaluation of ecosystem services perform a cognitive labour, yet differently from classic industrial applications where cognitive labour identifies natural forces to funnel them into artefacts, such labour does nothing but analyse ecosystem vitality to bring to light its, as yet unrecognized, commodity character. Said differently, it looks like the frontier of commodification is penetrating further into nature without actually *doing* anything to it, just acknowledging its actual status of commodity. This explains why the character of the value ascertained is controversial (is it rent, that is, revenue obtained thanks to property rights over a resource that others demand, or should one call it profit obtained by putting nature straight to work?), as controversial is the character of subsumption (is it formal, as nature's performance is left untouched, or is it real, as nature is refashioned as a commodity?) (Pellizzoni, 2021, 2022). Whatever the answer, one is faced with a sort of direct integration of nature into the capital circuit (Leonardi, 2019), making Marx's famous claim that 'the waterfall, like the earth in general and every natural force, has no value, since it represents no objectified labour' (Marx, 1981: 787) look dated. Again, one wonders if the case for the end of cheap nature has been made too in haste. For sure – thinking also of other issues, from geoengineering to human-machine interfaces or precision agriculture (big data applied to farming) – there is hardly any conclusive evidence that limits to a further 'horizontal' expansion of capitalism over biophysical materiality cannot be more than compensated for by the increase in its 'vertical' integration (Smith, 2007).

For Marxist authors, in any case, the notion of Anthropocene is problematic not so much in itself – as a descriptor of the current and prospective condition of human living on the planet – but because it leads to obscuring socio-ecological unbalances and injustices. This perspective is shared by scholars who do not

endorse a Marxist approach. A most significant example is Donna Haraway. In the book *Staying With the Trouble*, Haraway distances herself from the forces that, she claims, disrupt the constitutive relationships between humans and other terrestrial beings; forces condensed in the terms Anthropocene and Capitalocene, against which she proposes the notion of Chtulucene. The latter conveys ‘a kind of timeplace for learning to stay with the trouble of living and dying in responsibility on a damaged earth’ (Haraway, 2016: 2), overcoming expectations of technical fix and claims of comprehensive understanding of the world, and allowing that unexpected kinships, unpredictable, non-hierarchical and continuously changing assemblages, be generated.

Haraway’s perspective is not isolated. In recent years, references have multiplied to the ‘intrusion of Gaia’ in human affairs (Latour, 2017; Stengers, 2017); to the need to inaugurate a ‘geological politics’ (Clark and Yusoff, 2017) that builds on the recognition of ‘geopower’ (Grosz, 2011; Povinelli, 2016), namely, an ensemble of terrestrial forces and dynamics with which political power has to deal. Of course, one thing is to conceive of earthly entities and processes in terms of an invitation to ‘taking care’ of the world (Puig de la Bellacasa, 2017), recognizing affinities and building bonds with the infinite variety of the non-human. Another is to conceive of geopower as a supreme indifference for human affairs, which manifests itself in geological and biological phenomena such as hurricanes, earthquakes, viruses and bacteria; an ‘inhuman’ nature (Clark, 2011) with which it is not possible to cultivate any relationship, much less of care, the question being rather of recognizing the yoke of a ‘form of sovereignty, . . . a power that dominates the heads of state’ (Latour, 2018: 84), to which it is necessary to bow, being clear that ‘there is no other politics than that of humans and to their own benefit’, and no possibility of living ‘in harmony with so called “natural agents”’ (Latour, 2018: 86–87). Yet, in any case, the acknowledged condition with which to come to terms is precisely that for which the notion of Anthropocene has come to work as a signpost, and the rejection of which in favour of alternative concepts does not question but rather confirms. Said otherwise, the point is not so much whether one feels comfortable with the notion of Anthropocene or prefers another one, capable of pointing to what one thinks most relevant – the socio-ecological disruptions of capitalism, or a dominative take on the nonhuman world increasingly unable to govern in its own terms the situation it has engendered. The point is that the situation is problematized in much the same way.

The ruling problematization

Let’s elaborate on this. As it appears, both those who endorse the Anthropocene and those who attack the notion assign it a veridical function: namely, of sanctioning the definitive shelving of the modern account of the relationship between human agency and biophysical materiality. An account whereby mind is at once separate from the material world and capable of accessing it – as it actually is (Descartes) or as filtered by human perceptual capacities and structured according

to the a priori categories of cognition (Kant). Note that in both versions the correspondence between knowledge and reality is ensured, and with it the possibility of a successful handling of the biophysical world, understood as a passive, or passively reacting, materiality.

The attack on this sense-making of reality and human agency ostensibly begins with the rise of complexity and non-equilibrium theories between the 1960s and 1970s. These account for a much more intricate connection between human action and the world acted upon than previously conceived,⁴ leading to concepts like ‘trans-science’ (Weinberg, 1972), that is, scientific questions (such as the long-term handling of radioactive waste) that cannot be addressed through usual lab-confined experimental procedures, but only in the open, as ‘real life experiments’ (Krohn and Weyer, 1994). As far as the social and human sciences are concerned, the attack becomes massive with the so-called ‘ontological turn’: the rise of ‘new materialisms’ (Coole and Frost, 2010) in the late 1990s and their growing success in subsequent years. Direct target of criticism is the ‘excessive power . . . to determine what is real’ (Barad, 2003: 802) granted to language by postmodernists. Yet all western ontological dualisms (mind/body, subject/object, natural/artificial, sensuous/ideal, living/non-living, masculine/feminine, active/passive, and so on) are criticized as theoretically untenable and morally and politically blameworthy for their dominative implications, any binary entailing the pre-eminence of one pole over the other. A variety of theoretical sources are brought to the forefront, including non-western ontologies (Viveiros de Castro, 2014; Descola, 2014). Yet new social science outlooks are often perceived to be instigated by changes in scientific accounts of reality (Coole and Frost, 2010; Kirby, 2011). Though one should more appropriately talk of a conceptual cross-fertilization between the social/human and the biophysical sciences (Pellizzoni, 2014), the claim is that the deconstruction of the mind/body or language/matter binary is ‘in line with contemporary science and with contemporary turns to life and living systems’ (Colebrook, 2011: 3), where phenomena are increasingly conceptualized in terms of porous boundaries and blurring distinctions, entailing for matter (both organic and inorganic) to be conceived as agential, inventive, generative, and for reality as made of ever-changing assemblages (Barad, 2007; Grosz, 2011).

The emancipatory implications that much of such literature draws from the demolition of dominative polarities and fixed identities is however contradicted by the contemporaneous ‘turn’ one can detect in capitalist economy and neoliberal regulation. We have seen how capitalist commodification thrives on intensified forms of subsumption. Such intensification goes hand in hand with the overcoming of traditional dualisms. With biotech ‘life’ becomes simultaneously matter and information, thingness and cognition, presence and pattern, real and virtual, moving fluidly from living cells to test tube, to digital databases (Thacker, 2007). Biotech patents cover at once matter, for example seeds, and the genetic information these contain. And, by saying that the biotech industry are doing not only what humans did for thousands of years but what nature always did, if less precisely

and competently, corporate narratives bluntly claim that nature and technology are just one and the same thing (Pellizzoni, 2020).

This claim puts in full light the meaning of the Anthropocene outside specialist debates, the reason for its rapid success among broad audiences and the dubious effectiveness of critiques that build on similar ontological grounds. The latter aspect gains further evidence when one considers the recipe for the future proposed by different positions: capitalist and anti-capitalist; calls for decoupling from the biophysical world and invitations to care and kinship. The case is invariably for a politics of trial and error, constant experimentation, self-government, preparation to surprise, resilience and adaptation to the unpredictable and uncontrollable. This politics is consistent with the neoliberal understanding of the unplannable character of reality (Taleb, 2012) and with its approach to regulation, advocated and practiced at any level: from personal ‘responsibilisation’ (Rose, 2007) for life choices to corporate management in turbulent economic conditions (O’Malley, 2010). This governmental logic seems at odds with the case for a ‘stewardship’ of the planet based on keeping (or restricting) societal taps and sinks within boundaries capable of ensuring a ‘safe operating space for humanity’ (Rockström et al., 2009). Planetary boundaries, however, are just another name for geopolitics. And given the complexity of planetary processes and the speculative aspects entailed in any attempt to grasp them, a trial and error approach is hardly ruled out, and indeed may result mandatory. One can actually observe a torsion in the very notion of control. Pretty much as the volatility and unpredictability of financial markets do not permit any proper control, even in terms of probability estimates, but only non-predictive decision-making based on experiential judgement, rules of thumb, intuition and so on, so tackling planetary dynamics such as climate and weather turbulences⁵ by means of techniques like spraying sulphates into the stratosphere or seawater into the air to increase solar radiation reflection, or even sinking huge amounts of carbon dioxide in repositories with the constant threat of their sudden liberation in the atmosphere, means adding chaoticity to an already chaotic system, making it impossible to predict with any degree of reliability the actual short and long-term impact of such applications (Macnaghten and Szerszynski, 2013). One is confronted, in other words, with a strange type of control; something that controls by non-controlling, namely by letting loose(r) a system in view of reacting and adjusting on the spot to the swerves it has contributed to elicit (Pellizzoni, 2016). In short, it seems that the idea of ‘stewardship’ should be updated compared with traditional understandings. Riding uncertainty, rather than trying to reduce it, is the governmental style of the Anthropocene era.

Conclusion

With the Anthropocene, one may say, the ecological crisis is definitively acknowledged, yet no longer as a threat to be tackled but as a condition to be embraced – to make money or kin, according to personal inclinations. In this sense, the

Anthropocene partakes in an emergent declension of the very notion of crisis which, contrary to the modern tradition (Koselleck and Richter, 2006), does not correspond to a contingent situation asking for a decision but to a permanent condition asking for management (Gentili, 2018). Crisis, one may say, is no longer a political but an economic matter. Moreover, the very notion of Anthropocene reaffirms, by declaring it over, the western dualistic conception of society and nature (Görg, 2022), ambiguously evoking at once their separation and indistinctness without touching the dominative relation of the former over the latter.

These considerations give support to the claim that, before than a scientific hypothesis or a narrative of mediatic appeal, the Anthropocene is a governmental *dispositif*, capable of orienting sense-making towards assertions that may diverge in the evidence considered relevant and the social, cultural and political implications drawn, but are unable to really question the global order. In this view, its rise and success are hardly coincidental. The notion of Anthropocene is the epiphenomenon of something broader and deeper: the sense of reality and of individual and collective destiny enacted and enforced by the transformation of capitalism begun some decades ago and proceeding at a growing pace. Though waiting for a full understanding, the destructive effects of such process – the SARS-CoV-2 pandemic is a telling example – are increasingly hard to deny.

Escaping from a problematization that joins together defenders and a host of contestants of the ruling order has therefore become an urgent task. For reasons that should be evident from the previous discussion, one has neither to forge ahead, embracing technological hype and a regime of ever-unfulfilled promise (Pellizzoni, 2020), nor to point to a return to the past – whatever this may be taken to mean: from mythical, and concretely often oppressive, premodern ways of living to reassuring, and often misleading, Cartesian or Kantian accounts of the world and human agency. One is rather to move laterally, giving the notion of Anthropocene – if one wishes to keep it – a new meaning.

To this purpose indications coming from scholars like Benjamin and Adorno are precious, and ongoing experiences in the global North and South are worthy of careful consideration. Adorno's (1998) case for the primacy of things over thought and for the need of complementing the logical element of conceptualizations with the acknowledgement of the uniqueness of each encounter with the human and the non-human Other helps grasp that uncertainty has not to do just with the ever-perfectible state of scientific knowledge. Indeed, rather than suggesting caution, the assumption of perfectibility has legitimated and encouraged taking decisions as if the knowledge available at any given time was sufficient for handling the world in full accord to purposes. The results are under our eyes. Uncertainty should instead be seen as a constitutive condition of cognitive incompleteness and value incommensurability to which action should conform, leading to criteria of efficiency sensitive not just to the maximization of some performance, established according to abstract parameters, but to the reversibility of choices, local conditions, even the meaningfulness of a 'not doing' of technical possibilities. This position is often mistaken for technophobia, but it has rather to do with Adorno's and Benjamin's claim that it is possible to conceive of a different science and technology; 'a kind

of labour which, far from exploiting nature, is capable of delivering her of the creations which lie dormant in her womb as potentials' (Benjamin, 1969: 259). And that, contrary to what both the liberal and the Marxist tradition have assumed, human emancipation is not necessarily dependent on the exploitation of the biophysical world – quite the opposite, indeed: the instrumentalization of nature triggers and implies the instrumentalization of humans, and vice versa.

Thinking of another Anthropocene, in the sense of another take on social and more-than-human relations based on humbleness and respect, is not empty utopia. There exist today plenty of 'real utopias' (Wright, 2010), or 'prefigurative mobilizations' (Yates, 2015), where alternative ways of relating among people and with biophysical materiality are experimented: from participatory plant breeding (researchers cooperating with farmers to adapt varieties to local ecosystems, rather than the opposite: see Ceccarelli and Grando, 2009), to frugal innovation (products and processes reworked to reduce material and financial costs, rather than increase performance or profit: see Khan, 2016); from permaculture and other forms of regenerative agriculture to farmers' markets based on 'just price' (buyers paying beforehand farmers to support their work, in return for an agreed amount of product – or even variable, depending on harvest results). Admittedly, these and comparable experiences are presently fragmented and faced with 'extraordinarily strong counter-flows of power' (Schlosberg and Coles, 2016: 174) that struggle for the maintenance of the status quo. Their capacity to trigger major changes is uncertain – contingent events, climatic or of other types, might play a catalysing role. Yet they constitute the most credible way to a liveable Anthropocene.

Notes

- 1 Crutzen and associates trace the origin of the term in the late eighteenth century (Steffen et al., 2007); others (Lewis and Maslin, 2015) in the early twentieth. That the notion has gained traction now indicates in any case how it captures or aligns with the spirit of the time, as marked by unprecedented technological capacities and environmental threats.
- 2 Andreas Malm (2016) notes that the capitalist organization of economy was key to the shift from water to coal in the early industrial period.
- 3 Think of the 'FlavrSavr' tomato (the first commercialized transgenic plant, in 1994), modified to make it more resistant to rotting, or the 'AquAdvantage' salmon, genetically modified to grow quicker; or else of the 'Roundup Ready' soybean, a genetically engineered crop resistant to glyphosate (a powerful herbicide).
- 4 The idea of a reciprocal affection between observing and observed entities is of course crucial to quantum physics, which emerged much earlier, at the beginning of the twentieth century. However quantum physics did not question the traditional concept of experiment as a decontextualized test of reality.
- 5 These are in fact the subject matter of some financial derivatives (Cooper, 2010).

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