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Popular Music and the Anthropocene[1]

Introduction

In light of the current socio-ecological challenges facing humans, non-humans, and other life forms, we think that actors in the worlds of popular music and scholars in the field of Popular Music Studies need to reflect on their positioning, their agenda, and their priorities. To gain a better understanding of these challenges, we will present some of the concepts, theories, and debates that have revitalised the ecological approach, in particular the concept of Anthropocene. Next, we will present a case study to address the possible actions as well as subsisting issues and unanswered questions concerning popular music. After an overview of previous work, we will introduce each of the contributions to this special issue.

ECOLOGIES

Anthropocene

For many scientists, social science researchers, activists, artists and institutions, we are now living in the Anthropocene, a term proposed by the atmospheric chemist Paul J. Crutzen in the early 2000s to describe a new geological era (Crutzen & Stoermer, 2000) that has replaced the Holocene.[2] The term Anthropocene, from the prefix *anthropo-*, means that human activities are now a geological force that have a decisive influence on the future of the Earth and those who live on it. Although the debates as to when this era began have not been resolved, the consequences of the era are well documented: global warming, melting glaciers and pack ice, rising sea levels and acidification of the oceans, massive extinction of animal and plant species, decline in biodiversity, extreme and increasingly

[1] Many thanks to Martha Fillastre for her translation from French to English.
[2] The term ‘Holocene’ refers to a geological era that began about 10,000 years ago.

frequent weather episodes, forced migrations of humans, animals and plants, as well social crises. As a series of scientific reports have shown, in particular those produced in 2018 and 2019 by the IPPC,[3] the way the Earth functions is already more impacted than what had been predicted by most scenarios, and the rate of biodiversity loss has intensified. We are, therefore, at a major turning point, probably irreversible for thousands of years. Despite the continued use of hubristic slogans like 'Save the Planet', it is living beings, more than the Earth (which has already seen many upheavals) who are threatened with extinction. Although the proponents of the term Anthropocene agree that human activities have become a force that is influencing the geological course of the Earth, and stratigraphers are already finding traces of that process in rocks and sediments (Zalasiewicz, 2010), we can however identify two contrasting narratives about the Anthropocene.

A positivist Anthropocene

The first narrative considers the emergence of the Anthropocene as the result of a long process linked to evolution. For biological reasons, human beings have acquired a reflexive ability (awareness) and have developed languages and technologies that have enabled them to 'control nature'. At a point in this process, mankind over-mobilised the planet's resources, which resulted in global warming and the multiple ecological disruptions of today. Faced with this situation, mankind should assume its historical responsibility and take effective control of the Earth. New technologies, such as climate geo-engineering could reduce geological disruptions and address these new challenges. This option, which many researchers and activists consider as a dangerous evasion of the issue (Hamilton, 2013), is defended, in particular by Crutzen himself.[4]

[3] Intergovernmental Panel on Climate Change, an organisation made up of scientists who compile and analyse climate-related research from all over the world.
[4] The idea that it is possible to *repair* the damage caused by growth and continuous development is also at the heart of the concept of sustainable development, and we will come back to this later.

The second interpretation of the Anthropocene, which we owe in particular to the historians Bonneuil and Fressoz (2014), is a much less mechanistic approach that views the concept from a historical perspective. Rather than seeing the Anthropocene as a logical and inevitable consequence of human evolution and exceptionality, these historians first point out that the relationship that modern societies maintain (intellectually and materially) with (what they call) nature dates only from the 16th and 17th centuries and was originally confined to Western Europe. It was indeed at this time that modern sciences emerged and forged this new cosmogony where nature is a separate entity, distinct from humans and where the laws of the universe can be read (Shapin, 1996).

This vast undertaking of knowledge involves the classification and quantification of the world through clocks, measurements, maps, grids, calendars (Landes, 1983; Despoix, 2005). It is a process that has allowed the increasing monetisation of activities and territories, the possibility of converting things, beings and spaces into data, statistics and capital (Mackenzie, 1981; Desrosières, 2010). Science encompasses under the term nature the animal, plant and mineral worlds and considers them as subordinate because they have no consciousness. However, it also includes women (Gardey & Lowy, 2000; Merchant, 2003) and many other peoples that it calls savages, for that matter. Confined to the fringes of humanity, some of these populations were colonised, others were exterminated, while others were uprooted from their places of life, enslaved and transported by slave ships in unspeakable conditions to conquered territories (Ferdinand, 2019). When the ‘positivist Anthropocene’ observes today that mankind has reached a critical point, it forgets, on one hand, that modern cosmogony is not the only cosmogony; other human societies, some of which continue to exist, have lived differently with the world and for them, nature simply does not exist (Descola, 2004; Viveiros de Castro,2014; Ingold, 2000; Kohn, 2013). A large number of them have already seen the end of their own world: the Inca and Maya genocides led by the conquistadors, the slave trade in Africa and the Caribbean, and other colonisations. To understand the current situation, we therefore need to shift our focus, listen to other narratives, broaden our horizon and consider the world beyond the West, today

as in the past (Wallerstein 1974, 1980, 1989 & 2011; Braudel, 1979; Chakrabarty, 2000; Hornborg & Crumley, 2006; Subrahmanyam, 1997; Boucheron, 2019).

Secondly, contrary to the widespread idea that the industrial revolution in the United Kingdom in the 18th century was the turning point, Anthropocene historians point out that predations against the Earth and people are, in fact, much earlier: the dissolution of the commons in England, which began in the 12th century and became widespread in the 16th and 17th centuries, and the 18th century deforestation of Continental Europe. Likewise, although it has now reached a critical stage, ecosystem deterioration also has a long history. Industrial, chemical and mining pollution was already common in 19th and early 20th century Europe. Environmental history (Fressoz, Graber & Qunet, 2014) has thus shown how, throughout this sequence, public policies have systematically favoured the development of industry and intensive agriculture to the detriment of workers and inhabitants of the territories. Historians have also described in detail how scientists had, in the name of progress, underplayed the dangers of industrial development and dismissed popular knowledge and local voices (Fressoz, 2012; Leroux 2011). This development of capitalism was not only material; it also drew on different types of narratives that naturalised it. There have been many studies that recount how the political economy (Polanyi, 1944) and its neo-liberal variant (Foucault, 2004) imposed the idea that individual interests and the appetite for profit were beneficial for society and that the market had to be left free in its movements. Likewise, the characters and narratives of paintings, literature and opera have given substance to nature as a separate entity and a shelter and have described overseas landscapes and inhabitants as exotic and savage. to exotic landscapes, to the figure of the savage.

In reality, and as Pomeranz (2001) has shown, the rise and triumph of the West from the end of the 18th century onwards has more to do with the ‘advantages’ gained through colonisation and slavery and a series of geological and biological opportunities (including diseases transmitted to colonised peoples and the presence of coal in Britain) than with ‘Western genius’. What Bonneuil and Fresssoz call ‘the Anthropocene event’ is the result of the development of capitalism, from conscious

and determined policies at local, national and international levels, and not from a progressive and immanent movement of humanity (Hamilton, Bonneuil & Gemenne, 2015; Moore, 2015).

Today, inequality between territories, social groups and individuals is still very much in place, and even increasing. This is because the exposure to ecological damage is not the same in the USA as in Bangladesh, between precarious workers living in isolated areas without public services and the beneficiaries of globalization living in the heart of the metropolis, between women and men (Mies & Shiva, 2014; Hache, 2016), between white people and racialised populations (Ferdinand, 2019). As many social movements have shown, such as the recent yellow vests movement in France in 2018 and 2019, populations that are exposed to pollution are often the most socially precarious; environmental and social injustice are two sides of the same coin.

Capitalocene?

The quantification of the world

Although the historian and geographer Jason W. Moore rejects the term Anthropocene, his notion of Capitalocene nevertheless bears many similarities to the historicised version of the Anthropocene (Moore, 2015 & 2016. Moore & Patel 2017). Drawing on a vast corpus of earlier works and in particular on Marxist-inspired approaches to geography (Harvey, 2018) and ecology (Foster, 2000), the long-term historical narrative of Braudel (1979) and Wallerstein's Modern World-System (1974, 1980, 1989), Moore, like Hornborg and Crumley (2006), seeks simultaneously to examine human history (at the global level) and the history of the Earth system. To do this, he uses capitalism as the theoretical and historical anchor. What does he tell us? Like the historians of the Anthropocene, he shows that capitalism began *before* the British industrial revolution, with the conquests (and genocides) of America in the 15th century. He also shows that this relation to the world is based on an intellectual foundation that emerged as far back as the Renaissance and picked up steam in the 17th and 18th centuries with the Scientific Revolution in the Christian world. For him also,

colonialism, scientific revolution, political economics, capitalization, metrology, the subjugation of women and slaves are part of the same movement that imposes and supports – at different levels – the global expansion of capitalism and its perpetual (re)organisation of the world. Of course, these different periods and processes are neither homogeneous nor linear, and they take place in a context of unbridled (and valued) competition between investors, territories, countries, and empires.

Putting nature to work

An essential point of Moore's analysis is to show that for capitalism to prosper, for it to be able to produce value and make profits, it needs not only to exploit workers but also to have a substantial amount of *free labour* at its disposal. This work is not only produced by human beings. Drawing on the work of Burkett (1999), Moore declares 'that the formation of the "law of value" is based, not only on the force of labour transformed into merchandise, but also on another type of "work": the work of nature.' (Moore, 2015: page 11) If we take the example of the Caribbean colonies, we see that not only were slaves deported there in order to provide practically free labour, but their ecosystems and non-human beings were also brutalised in order to set up vast plantations of intensive monocultures of sugar cane, banana, and cotton, which are still in use today (Ferdinand, 2019). In short, territories, ecosystems, humans and non-humans are *all* put to work to provide for the needs of the metropolis. For Moore, each new transformation of capitalism is based on the harnessing of new forms – both human and non-human – of cheap work.[5] Capitalism is therefore not only an economic system that exploits workers and creates new needs, *it also puts nature to work*, shapes it and transforms it, the product.[6] The major crises of capitalism correspond precisely to the periods where the proportion of

[5] It is from a comparable perspective that other analysts have documented the colonisation and exploitation of overseas territories by colonial powers in the 18th and 19th centuries (Pomeranz, 2001), the replacement of hydropower by coal during the British industrial boom (Malm, 2016), the adoption of oil after World War II (Mitchell, 2017), or the vast transfer of industries during globalisation at the end of the 20th century. Each time, the adoption of new fossil fuels and/or the annexation of territories is aimed at minimising the cost of labour, defusing worker resistance and securing the proportion of cheap labour.

[6] It should be noted in passing that this way of viewing the exploitation of workers, women (especially in the domestic sphere), racialised populations and nature in the same movement is very close to the themes of ecofeminism, which show how different forms of *reproduction* perpetuate the capitalist system (for instance, see Starhawk, 1979; Plumwood,1993; Merchant, 2003; Mies and Shiva, 2014; Hache, 2016).

cheap work becomes insufficient to ensure the added value and reproduction of capital. At this stage, capitalism has to extend the scope of appropriation both horizontally (territories and markets) and vertically (subsoil extraction), a movement that compresses time and space (Warf, 2008; Virilio, 1995).

Reciprocally, and this point is crucial, Moore shows that 'world capitalism' is *itself dependent on the materiality of nature.* It has to deal with what nature can (or cannot) provide in order to achieve its goals. For example, to develop cotton or sugar cane plantations in the Caribbean, there had to be territories and climates that were somewhat suited for the purpose. Although nature is effectively shaped, and even historicised, by capitalism, its management (to use the language of technocracy) nevertheless comes up against material limitations (Harvey, 1999).[7] Consequently, *capitalism is co-produced by humans and nature.* It is caught inside and produced by the 'web of life', an expression that was first coined by Capra (1996). Rather than think of what human beings are doing to 'nature', or vice versa, it is the entanglement of all components of the web of life and the history of these processes that we have to envisage.

Making history or investigating contemporary situations means thinking and reconstructing the interactions that take place within this common matrix. To assess the extent of this interlinking and give a concrete example, we will point out, for example, that the invasion of South America by the conquistadors and the ensuing colonisation generated what is known as the Columbian Exchange, a series of biological movements and transfers that affected wildlife, agriculture, animal, and human pathologies on a scale probably unprecedented on Earth (Crosby, 1972). According to Lewis & Maslin (2015), the pandemics (we also add the massacres) that affected up to 90% of Amerindian populations enabled the unusual development of vegetation in vast areas. Owing to this growth, a large quantity of CO_2 was trapped, contributing to the formation of the Little Ice Age, which affected the North Atlantic at the beginning of the 14th to the end of the 19th century, a period that was

[7] For example, how can the reactor of a nuclear plant be cooled with water from a river if the river's flow rate becomes structurally too low?

previously interpreted as a 'purely' geological episode linked to volcanic eruptions (Lewis & Maslin, 2015; Williams, 2017). This example – which some people consider to be the beginnings of the Anthropocene – show us precisely how 'natural' history and human history are inextricably embedded (Bristow & Ford, 2017). The 'climate' coproduces the 'social' at the same time as the 'social' co-produces the 'climate'. When 'Green Arithmetic' calculates what human activities cost nature (the so-called 'externalities') it reasons in a way that is not so far removed from the international agencies and firms that quantify the 'services' of ecosystems. It considers nature as a sum of resources that can be converted into currency, quantified and exchanged. Moreover, in so doing, the other victims of predation policies are ignored.

Ultimately, like the historical variant of the Anthropocene, Moore's work teaches us that the *environmental crisis cannot be resolved technically*, by reducing the proportion of what we take from nature. This is because nature has already been configured according to what human beings do (or do not do) in it, as demonstrated by the Columbian Exchange or the increasing anthropisation of environments. The current situation perfectly illustrates this interdependence. If the present ~~current~~ convulsions of the Earth (hurricanes, floods, drought, decline of biodiversity) are indeed the result of human actions on the climate, these events and transformations in turn hit humans with unsuspected force, and no technology is able to withstand them.

Anthropocene? Yes

Even if Moore's approach is extremely fruitful, the term Capitalocene seems too restrictive in our opinion,[8] whereas the historical approach of the Anthropocene developed by Bonneuil and Fressoz (2013) is more open~~, that the uses of the term are quite polysemic, with a variety of users~~. In fact, Bonneuil and Fressoz do not focus as much on defining what is (or is not) the Anthropocene; they are

[8] To the proponents of the Capitalocene, we might point out that the governments of 'real socialism' (the USSR and its satellite countries in Eastern and Central Europe as well as Yugoslavia, Albania, Cuba, Vietnam, Laos and Cambodia, China, and North Korea) have also exploited the Earth in ways comparable to capitalist countries (see Chakrabarty, 2015).

not seeking to impose a term, but rather to historically document a series of processes that have resulted in the current situation. Secondly, the term is used in Earth Sciences, Human Sciences, by NGOs, activists, and artists alike. The fact that geologists are debating whether human beings are a geological force and that philosophers consider hurricanes and the climate as decisive players reflects this Copernican uproar that the Anthropocene, as a situation and an event, expresses and, perhaps, makes other paths possible. The social polysemy of the word and its instability mirror the current intellectual and material reconfigurations. Of course, adopting the term Anthropocene does not mean that we have to forego the other approaches, angles and echoes that currently abound. And it is precisely to these other voices that we are now going to listen.

The metamorphoses of ecology

The mirage of the Wilderness

In 2007, the philosopher Timothy Morton published a book entitled *Ecology Without Nature: Rethinking Environmental Aesthetics.* At first sight, the idea that ecology should do away with nature may seem rather strange. However, this conviction is shared by many other analysts and scientists. Many works show that nature, as a separate, pristine and untamed entity, has often been fantasised, including by the many branches (philosophical, political, associative, and scientific) of ecology. For example, environmental history has shown that most of the time, what were considered wild lands without humans actually did include human beings. Cronon (1983, 1991 & 1995) thus demonstrated how North American regions described as wildernesses had actually been inhabited and developed by the Amerindians for centuries before Western colonisation. It therefore became necessary to coop these populations into reserves, and often worse, in order to create ‘natural’ parks and to preserve the wilderness. Cronon (1992) also described how the (famous) conquest of the West was based on powerful infrastructure and constant flows of goods, making it possible, on one hand, to conquer and develop these regions and, on the other hand, to extract its resources – minerals, wood, furs – which

were transported to the towns. In other words, the 'civilised zone' was closely dependent on the 'wild zone', which was neither virgin nor really isolated. In the same vein, the global history of the environment tells how rivers, valleys, landscapes and natural areas have been constantly (re)developed by human beings (Hughes, 2000; McNeill, 2000; Radkau, 2008). 'Nature' therefore has a history, is situated, and its physiognomy cannot be separated from that of all the human and non-human beings that live and move within it. Denaturalising nature is all the more important since the 'natural order' has often been mobilised to justify social norms (Daston & Vidal, 2004), and conversely, social order has regularly served as a model for 'deciphering' nature (Haraway, 1989).

Biodiversity versus nature

Currently, the concept of *biodiversity* seems to have largely overshadowed the concept of nature among scientific circles (Callicott, 1999; Larrère & Larrère 2009 and 2015). Ecologists are trying to reveal all the organisms – animal, human, plant, hybrid, mineral, bacterial – and energies that contribute to environments and to understand their interactions. In this context, less attention is paid to exceptional species than to the vast network of living things, to their many variations in different regions. 'Protected areas' are studied at least as much as *ordinary nature*, which develops, adapts and reconfigures itself in urbanised areas and metropolises where the majority of people live, in spaces and temporalities where the 'social' and the 'natural' are intermingled (Duperrex, 2019). This multi-faceted approach has, for example, resulted in the inclusion of human beings in the description of evolution in museums of natural history (Blandin, 2007). More generally, the very concept of living organisms seems to have become more complex and broader. Today, we are paying attention to minute creatures, such as bacteria, and to their contribution to ecosystems, the multiplicity of alliances that are created in hybrid networks, for example in the forest subsoil (Wohlleben, 2015). Reacting to the environmental and human disasters caused by the industrialization of agriculture and the technocratic management of environments and forests (Lowenhaupt Tsing, 2015), the development of permaculture, agroforestry – where human beings interact with all the components of the soil rather

than cultivating them – confirms this need to forge alliances with living organisms, to live with them rather than leading them.[9] As Catherine and Raphaël Larrère (2015) point out, moving from nature to biodiversity also means that instead of delegating the management of environments and territories only to scientists, environmental and ecological agencies, inhabitants and citizens are involved in debates and contribute to policy-making. In short, the concept of biodiversity leads us, not only to sharpen our analysis of living things but also to decompartmentalise nature and human beings, the countryside and cities.

Ecosystems and systemic approaches

What is true for nature is also true for the ecosystem(s). A few decades ago, ecologists thought that an ecosystem, for example an aquatic environment, was 'naturally' balanced, regulated and self-sufficient. Consequently, the task of scientists (like that of activists and environmental protection agencies) consisted, on one hand, in documenting this balance and, on the other hand, in protecting it from external invasions, whether ('invasive') plants, birds, insects or the disruptive action of human beings. These ecosystems therefore had to be *preserved*. The weakness of this concept has, however, been exposed by many ecologists for decades, as Callicott reminds us (1999: 5445-5705[10]). This is because, by considering ecosystems as autonomous entities, they first ignored their interactions with other environments. Secondly, they also overlooked the fact that no matter how stable it appears to be, every environment is constantly subject to external pressures and internal changes, and that it continuously adapts and renews itself, a process that Darwin's theory of evolution has already brought to light over a long period of time. In fact, what we are trying to understand today are the *dynamics*, the breaks, the fractures that drive, traverse and reconfigure ecosystems (Callicott 1999; Blandin, 2007; Botkin, 2012; Larrère and Larrère 2009 & 2015). As Ursula Heise (2008) has noted, this

[9] In a similar vein, a group of philosophers is exploring, in a new way, the world of domestic or wild animals, what human beings can learn from them and, according to the expression coined by Morizot (2016), the diplomacies that could enable cohabitation (Blanc, 2000; Haraway, 2008; Despret, 2019).
[10] Kindle pages

understanding of the closed ecosystem has deeply influenced the ecological philosophy that has often extolled the balance, stability and pristine beauty of the local. Just think of Thoreau (1854) writing about Walden, Leopold (1949) observing the cycle of seasons and the renewal of species or the way in which in which the environmental ethic of Naess' Deep Ecology movement (1989) is embodied in proximity and the local community. This preference for the local, for the self-sufficient, is still marked for many ecological political organisations, associations, and NGOs who continue to promote the defence or even the protection of the environment, of natural parks, exceptional animal species against 'invasions' and external threats. Sometimes these struggles can even become questionable when local populations are driven away or expelled on the pretext that they upset the balance of nature, as has been the case in Haiti in 2012, for example (Ferdinand, 2019: 225-229) or with the WWF in Cameroon (Pigeaud, 2017).[11]

An (even more) systemic ecology

Nevertheless, although the autopoiesis of cybernetics may have lost its relevance, this does not mean that the systemic approach is a thing of the past. On the contrary: ecology does not only refer to natural processes, it also considers and analyses processes as a whole, focusing on what links them together. The approaches developed by the historians of the Anthropocene, the proponents of the Capitalocene, environmental history, the environmental humanities (Heise, Christensen & Niemann, 2017; Blanc, Demeulenaere & Feuerhahn, 2017), many geographers and ecological philosophers, life and earth sciences, have not turned their back on the systemic approach present in 'original ecology' of a Humboldt or a Haeckel. Ecological thought means extending the scope of the entities that we include in this sphere and going beyond mere nature as we stated above.[12] Michel Serres (1990) had

[11] Similarly, it is not uncommon in some sectors of the social sciences and humanities, or in the professional worlds of music, that ecology, ecosystems, sustainability and biodiversity are still viewed as static and stability is presented as a virtue.

[12] With a dynamic approach such as this, the very concept of environment, which assumes that humans are surrounded by fundamentally different people and things, loses credibility, as does the concept of context (Latour, 1992). This is because beings or things are not only shaped by what is external to them but they also act with other beings, other things, other groups, and other entities. Conversely, by isolating the players in scenes, we ignore the interactions between these different

already proposed translating this attention to the world as a whole, in all its diversity, into a (natural) contract between human beings and the Earth, while Bruno Latour (2018) has proposed the creation of parliaments of things so that their point of view may be taken into account in the exercise of democracy. Echoing these proposals and the relationship that many indigenous peoples have with the world, some states have recently endowed nature, places or living entities (e.g. rivers) with legal personality. In other words, the World, Earth, matter and non-humans are increasingly acquiring a personality and have the ability for action.[13]

Limitations of environmentalism

What could be called the environmentalist approach has contributed significantly to raising awareness of ecological perils and taking into account, including from an ethical point of view, the need to take care of all the components and inhabitants of the Earth. Its local, regional, national, global, intellectual and militant actions have contributed profoundly to the emergence of an ecological awareness since the 19th century (Audier, 2017) and even more influentially since the 1960s (Carson, 1962; Jonas, 1984; Naess, 1989). ~~Today,~~ However, as the age of the anthropocene, environmentalism seems to have reached its limits, and there are, at least, four reasons why.

Firstly, because ~~today~~ environmental awareness is now at a global level, which is probably unprecedented in human history. ~~Today,~~ Greta Thunberg and movements such as Youth for Climate bring together millions of people at the same time.

Secondly, for the reasons mentioned above. The grabbing of territories and the endless exploitation of environments, the exploitation of workers in developed and poor countries, racism and misogyny are all part of the same relationship with the world, the same violence that takes place

theatres. Like the culture-nature dichotomy, environment and context suppose a difference in nature (a fitting expression!) between the subject and its surroundings (see also Ingold 2000 and 2013 on the concept and critique of environment).

[13] It will be noted that this concern to consider (in its dual sense of respecting and paying attention to) a wide variety of human and non-human actors and their interactions can be found in systemic approaches such as the Actor Network Theory, in new materialisms (Bennett, 2010), in Lovelock's Gaia hypothesis (1979) which sees the Earth as a living organism, or in the description of other cosmogonies by many anthropologists.

simultaneously in different places and on different types of beings (Moore, 2017; Ferdinand, 2019). It is no longer feasible to dissociate the environment from the social world.

Thirdly, because the emphasis, in many environmental discourses, on the responsibility of individuals and the promotion of local leaders capable of winning support are also problematic. Indeed, this rhetoric has many affinities with neo-liberal themes (and policies) that constantly insist that individuals are responsible for their own future and also place value on entrepreneurs and leaders. And yet, by putting all individuals on the same level, we forget that their 'responsibility' differs greatly according to their social class, gender, age, whether or not they are racialized, according to their residence, their job, the territory and the country in which they live. In fact, all generic and undifferentiated arguments, whether they focus on the responsibility and guilt of individuals, denounce ultra-consumerist practices or insist on the predatory nature of the human species, play down domination, mask the difference in living conditions, and side-line the responsibility of politicians and firms.

Fourthly, the insistence on individuals is all the less credible since individual action alone does not seem capable of reversing things. This point is exemplified by waste management policies. For instance, in France, the volume of domestic waste produced by households is 4% while the volume of production waste is 82% (41% for agriculture and intensive fishing and 41% for the building and construction industry).[14] Although the volume of domestic waste has decreased thanks to household selective sorting, waste from production continues to increase, to the great satisfaction of transnational companies that have converted to selective sorting (Jarrige, Leroux & Le Lay, 2016: 66). Consequently, in 'virtuous' nations ~~countries~~ like Germany and the Scandinavian countries, where a large proportion of the population sorts a significant share of their waste, travels by bicycle, and eats organic food, the state of pollution and the level of greenhouse emissions are not fundamentally

[14] The remaining 12% have not been identified.

different from other comparable countries.[15] The leverage effect, i.e. the ability of consumers to influence public policy and to force companies to adopt environmental standards, has not been proven.

While eco-citizenship, which, of course, has variations other than waste sorting, is undoubtedly an essential means of transformation, it is clear that it cannot, on its own, bring about a significant transformation. In order to truly reverse the situation, we would need to reverse the deregulation promoted by neoliberal policies, regulate transnationals, ban the export of waste, oblige countries to comply with the commitments that they make during the COP climate conferences: *We need to act primarily on production and countries have to truly commit to an ecological transition.*

When we look at the slogans brandished during the recent climate protests and strikes, it is clearly the governments and international institutions that are challenged for their inertia, and transnationals that are blamed for the crisis. Greta Thunberg crosses the Atlantic in a sailboat but does not focus her speeches on the responsibility of individuals. Her main objective is to raise awareness about the *environmental and social injustice* to which people worldwide and the future generations are exposed, and to compel the main entities that are responsible (firms and states) to take heed of the alert given by scientists.

It is too late for sustainable development

What the example of the increase in waste production (which also applies to greenhouse gases, pollution and intensive agriculture) shows is that development cannot be sustainable. If, at the beginning of the 1970s, in the wake of the Meadows report (*The limit of growth*, 1972) and the adoption of this objective by UNESCO, it seemed possible to contain and regulate the rise of capitalism and the industrial world, this wager has now been lost. This failure can be explained by many factors. First, the belief in the virtues of economic growth is still strong in most countries and continues, not only to guide public policies, but also to structure many political imaginaries (Hamilton, 2003; Méda,

[15] Not to mention that making waste invisible probably prevents companies from realising how much waste they produce (Monsaingeon, 2017).

2013). This endless growth generates more and more greenhouses gases, increases the exploitation of land, seas, forests, human beings, non-humans, and more and more production(s).

Second, the neo-liberal deregulation which was initiated at the turn of the 1980s in the UK by Margaret Thatcher and in the USA by Ronald Reagan allowed the market, finance and firms to impose their laws, three rationales that are perfectly antithetical to the common interest. This process also corresponded with two other major events: globalisation and the use of digital technologies. The first term refers to the process whereby many industrial activities and services were transferred to poor countries. This transfer enabled companies to reduce their labour costs drastically and more generally to circumvent social, health and environmental legislation acquired through decades of social and democratic struggles. As a result, a number of countries such as China, India and Brazil have embarked on intense development policies comparable to those of Western countries. Globalisation entails an ever-increasing relocation of production, an even more systematic use of nature and overexploitation of workers.

All these interactions, particularly financial ones, were also greatly facilitated by the increasingly widespread use of computers and the development of the Internet in the mid-1990s. And yet, *infrastructures and the mass of objects* that support the Internet and mobile telephony contribute substantially to greenhouse gas emissions, soil destruction, pollution and waste (Bardini, 2011; Gabrys, 2013; Flippo, Dobré & Michot, 2013; Latouche, 2015; Minter, 2013; Cubitt, 2017), not to mention the destruction of jobs and the dangers linked to the capture and use of data by the GAFAM. Far from dematerialising, the use of digital technologies has heightened the material dimension of modernity.

At the same time as the digitalisation of the world, a new version of cyber-utopianism has led people to think that by monitoring all activities, we can optimise and manage them more rationally, especially with respect to energy (Dubey & De Jouvancourt, 2018). In doing so, we overlook the fact that firstly, the collection and processing of data requires new infrastructure; and secondly, that the use of new technology can increase rather than decrease consumption and production. Insulate

apartments, and the temperature of homes will rise (Dubey & De Jouvancourt, 2018: 50), create Smart Cities and they will become even more attractive and widespread, computerise the documents and their number will explode, recycle plastic products and they will multiply infinitely and penetrate into all organisms (Harvey, 1999; Georgescu-Roegen & Bonaiuti, 2010). If the result is often the opposite of the expected outcome, it is because *environmental problems cannot be solved with technical solutions*. They are only one of the expressions of predatory policies and forms of exploitation that also appear in other spheres and concern other creatures. The systemic approach teaches us that we need at least to identify the causes as much as the consequences of a problem.

(re) THINKING POPULAR MUSIC IN THE ANTHROPOCENE ERA

After this obviously non-exhaustive presentation of the questions posed by the Anthropocene Era, we will now examine their implications for the worlds of popular music. Rather than issuing general injunctions, we will look at some recent initiatives within the music industries and among popular music artists. These examples will give us an insight into how and with whom the ecological problems of music may be addressed. As in the first part of this introduction, our reflections intermingle history, theory, and practice. We end this second part with a rapid review of existing literature and the presentation of the six contributions to this special issue.

Something's happening

The first point that we would like to raise is the strong presence of climate and environmental issues in the public and media space since the Paris COP 21 in 2015. As we write these lines, Greta Thunberg has just been named Person of the Year by *Time* magazine and is addressing the COP 25 in Madrid. In September 2019, millions of people of all ages ~~teenagers and adults~~ demonstrated simultaneously around the world (from Sweden to Ghana to Indonesia) to demand that states and international

institutions finally and truly commit to limiting global warming. These mobilisations have seen the emergence of new forms of environmental activism such as Youth for Climate,[16] founded in Belgium, or Extinction Rebellion, born in the UK, which are spreading to groups in many countries. These movements advocate actions of civil disobedience, organise spectacular actions in large cities, strikes in schools and universities, demonstrations, and make extensive use of social networks to disseminate and discuss their ideas and to recruit new members. As with the Arab Spring of 2011 and the movement of the squares (Occupy Wall Street, Los Indignados, Nuit Debout and the Yellow Vests in France), these movements are very fluid, and are constantly debating their orientations. They are also quite horizontal in the way they are organised.

A case study

This mobilisation for the climate has also been expressed by the positions taken by world-renowned rock bands. For example, Coldplay announced in 2019 that it was not going on tour after it released its last album and was thinking about alternative ways of promotion.[17] Soon after, Massive Attack announced that it wanted to fund a Tyndall Centre study on the carbon impact of the music industry.[18] Still in 2019, a group of mainly English-speaking bands and artists, production structures, music labels (including major labels), concert organisers and individuals was created. Called Music Declares Emergency – No Music on a Dead Planet,[19] this group calls on governments to commit immediately to fight global warming and to 'acknowledge the environmental impact of music industry practices and commit to taking urgent action.'[20] They also declared that 'music, musicians and music businesses, through their unique cultural and economic power, can lead the way in demanding the

[16] https://youthforclimate.be/fr/

[17] https://www.lemonde.fr/musiques/article/2019/11/22/coldplay-engage-sa-transition-ecologique-et-differe-sa-tournee-pour-ne-pas-polluer-la-planete_6020204_1654986.html [accessed 12 December 2019].

[18] The Tyndall Centre for Climate Change Research in Manchester is a research centre dedicated to ecological transition. It is supported by several British universities and the Fudan University of Shanghai. https://www.tyndall.ac.uk/. On Massive Attack see https://www.theguardian.com/commentisfree/2019/nov/28/tour-world-massive-attack-band-climate [accessed 12 December 2019].

[19] https://www.musicdeclares.net/ [accesssed 12 December 2019].

[20] https://juliesbicycle.com/

systemic changes required to secure all life on earth.'[21] It should be noted that the group cites as sources of inspiration *Extinction Rebellion* and Julie's Bicycle, an older British NGO dedicated to sustainable development.

~~*A long tradition*~~

There are several points that we think need to be raised in response to these developments. First of all, Coldplay, Massive Attack and MDE belong to a genealogy. In recent decades other Anglo-American rock stars already carried out actions in favour of the environment, such as the anti-nuclear coalition MUSE (Musicians United for Safe Energy), which organised a series of concerts in New York and released an album and a film both entitled *No Nukes* in 1979.[22] This was followed many years later by *Live Earth* (2007), a series of concerts given simultaneously in several countries, aimed at alerting the world to the dangers of climatic warming. We could also mention Sting's commitment to certain Amazonian populations threatened by major works at the end of the 2000s, as well as a very large number of other events, initiatives, tours, and fundraisers. Even if all these actions present differences, in particular in the ways they mobilised and distributed their funds, what they all had in common was, first, the desire to alert and raise awareness about environmental issues, and second, the ability to use the reputations (and talents) of international artists to support these causes. Although MDE is part of this continuum of action, it stands out by the fact that, like the IPCC reports and activists, it demands that the climate be placed immediately at the centre of international and state agendas. If this is not done, then as its slogan says: *No Music on a Dead Planet*. The other distinctive feature of MDE is that it involves not only artists but also most segments of the music industry. It is as if the level of danger now requires the involvement of everyone.

[21] Ibid.
[22] Organisation initiated by Jackson Browne, Graham Nash, Bonnie Raitt, John Hall and the activist Harvey Wasserman.

More significantly, Coldplay, Massive Attack, and all the other members of MDE acknowledge that the music industry itself contributes to the emission of greenhouse gases, and they propose to act accordingly and without delay. That is truly new. ~~something!~~ Up until now, with the exception of a handful of artists who refused to use electrification, actions to reduce the environmental footprint of music have been concentrated mainly in festivals and concert halls and have focused on encouraging people to carpool, eat locally prepared organic food, drink from returnable cups, sort their waste, and use dry toilets. The engagement of artists mainly took the form of occasional support for causes and organisations and the inclusion of ecological themes in their music (Ingram, 2010). As far as we know, (parts of) the music industries had never really considered the *materiality* of professional practices as a major problem. However, as early as 2012 Mark Pedelty showed, with the example of the U2 tours and Live Earth, what the organisation and production of events of this type involved: high consumption of energy (mostly fossil fuels) for lights, amplifiers and video; extensive transportation for the artists (from the tour-bus to the airplane, including trucks for stage equipment) and the audiences; the use of electronic equipment for huge sets; and the production of waste, along with an astronomical consumption of water, heating, and pesticides used in the stadiums.

And what is true for marathon tours of bands in stadiums is also true for small bands performing in small venues. If we add up all the concerts that take place every evening worldwide, we reckon with huge quantities of energy and food expenses and considerable waste. Likewise, recording tools and media (consoles, effects, hard disks), listening devices (smartphones, computers, tablets), broadcast networks (streaming sites, social networks) and Internet and telecommunications infrastructure are also huge emitters of greenhouse gases and all sorts of pollution and waste. And here, the age-old debates on the respective qualities and shortcomings of analogue and digital technology are no longer really relevant. Although the (famous) vinyl records are made from petroleum-based PVC (Smith, 2015; Devine 2015), digital tools and networks are also great polluters (Fuller, 2005; Slade, 2006; Gabrys, 2011; Flippo, Dobré & Michot, 2013; Cubitt, 2017; Dubey & De Jouvancourt, 2018; Brennan

& Devine, 2019; Wolf, 2019). In short, it seems clear that MDE, Coldplay and Massive Attack have accepted the idea that the *entire infrastructure of professional music* is problematic, whereas until now, as in many other sectors, it was just the public that was required to be exemplary.

Massive Attack and the virtues of the survey

But how then can we understand what the music industry is doing to the world in order to act accordingly? Massive Attack have suggested that a survey needs to be conducted. The group wishes to collaborate with the Tyndall Centre to find ways of creating low-carbon or even zero-carbon tours. We find this idea exciting, for several reasons. First of all, instead of starting off by naming the usual suspects (users), the sectors where action can be taken and the 'solutions' to implement, the focus here is *to investigate* what is happening, where and when it happens, and who and what is concerned, in order to propose actions and transformations. In our opinion, Tyndall should not limit itself to concerts and tours alone, as it seems to indicate on its site,[23] but should also look at other aspects of music production (recording, production, broadcast and online consumption of concerts, music videos, albums, streaming, electronic equipment, etc.). Once all of these practices are documented, Tyndall would certainly see the emergence of a whole series of beings, people, groups, animals, plants and minerals, ecosystems, places, movements and, at least as important, other predators that are connected with pollution and greenhouse gas emissions related to the music industry's activities.[24] Moving from there, Tyndall could designate and prioritise the (famous) environmental responsibilities of each actor – is there a difference between the carbon emissions of a Haitian record label and that of a major label? – and, even more importantly, map the various types of predation linked to music production and consumption.

[23] https://www.tyndall.ac.uk/news/tyndall-centre-manchester-creates-plans-zero-carbon-concerts [accessed 20 December 2019].

[24] For each parcel of metal extracted from a mine (to produce a smartphone or a mixdesk) there is probably a transnational that is exploiting children in an African country, land lost that could have been used for food agriculture, and deforestation. For each data transfer from a streaming site, we will undoubtedly find tax optimisation to avoid paying local taxes.

Lastly, the Tyndall survey could also reveal the *specific characteristics* of the music world. Let us take the example of planned obsolescence (Latouche, 2015; Wolf, 2019). This is generally defined by the fact that it is becoming increasingly difficult to repair objects or keep them for a long time. Although this form of obsolescence is found primarily in the machines and software used by professionals and consumers, it also has a special variant in the music world. Indeed, we can consider as obsolescence the fact that the programmes of musical shows, festivals, concert halls, charts and TV shows are constantly renewed. In doing so, we are treating works, artists and recordings as things and, above all, are giving substance, day after day, to the idea that unending progress and growth are the alpha and omega of creativity. How then can we address this specific form of obsolescence? Should the number of new productions be considerably reduced or, following the degrowth movement, should the public be encouraged to play music itself and only attend concerts by local artists?

The problem here is that doing this would shift to the music industry answers that have been developed for food, buildings and energy by militant and institutional ecology, while music has specific characteristics: whereas a tomato may be (ideally) produced by organic farmers and eaten locally, we don't necessarily want to listen only to local music. We want to be able to discover other cultures, other soundscapes, go to these repertoires and let them come to us in the form of concerts and/or recordings. The short food supply chain therefore does not seem transposable to music production and consumption. Especially since our sensitivity is also modern: the constant renewal of our emotions is a constituent part of our personal development and relationships with others, and this desire can certainly not be considered unilaterally as an addiction to consumption, as individualism. To do without new discoveries, without travelling through time thanks to the recordings and technologies that accompany this relationship to music, would be to deprive us of the positive contributions of modernity, the very ones that have enabled us to connect to the world, to others, to other lands. With this example – and there are certainly others – it is clearly essential that the complexity of situations be taken into account in the survey and that the specificity of the musical worlds be restored.

In other words, not only should Tyndall conduct a survey into what it knows best (and we have no doubt they will), but it should also learn from the (music) world itself.

By taking a systemic approach to musical practices, and in particular by not limiting itself to environmental predation, by seeking to establish the specific features of the musical world, the study would certainly open up new fields of understanding and address the issues from a different angle. Of course, we do not deny that the decarbonisation of activities and the shift away from fossil fuels must be carried out without delay, but we doubt that the remedies are technical or technological and can be limited just to carbon. While carbon emissions are indeed the cause of global warming, they are the consequence of a global system of predation, including in music.

Some people might object that if we open this huge Pandora's Box we would find ourselves in the presence of so many players, objects, circulations, interactions, states and firms, many of which do not directly belong to the ecosystems of the music industry, that it would be impossible to act. Our answer to this is that the environmental crisis is precisely linked to the fact that these predations are hidden by the opaque circuits that globalisation has established. The failure of sustainable development is in particular due to the fact that environmental issues have been isolated; culture has been *practically* separated from nature. Wouldn't it be wonderful if it was precisely culture that broke this ice?

The issue of the public and public interest

In his 1927 book, *The Public and its Problems*, the philosopher John Dewey proposed to practise politics like an experiment. According to Dewey, in order to understand the problems facing a society, it is necessary to examine the situation again and again. But it is equally important that the public, ordinary citizens, lay people and groups, who have no voice in between elections, be able to actively participate in defining the investigations and play an active role in the creation of solutions. In other words, *to produce public interest, the public needs to be involved in the definition of the problems*. It seems to us that this lesson, which is almost one hundred years old, is worth pondering and could

guide investigations (one would not be enough) on the responsibility of the music industries in climate and environmental disruptions and their possible contribution to new worlds.

Involving the public in these investigations would, in particular, dispel suspicions of green-washing. For regardless of Massive Attack's intentions, a company or a professional sector are not necessarily in the best position to take stock of their own actions, even when they commission a study from an external organisation. There is often too much inertia. However, what the new environmental movements, which MED and Massive Attack are championing, show precisely is that on the one hand, laypersons and *ordinary people* are effectively taking up issues that were once the preserve of scientists, experts, institutions, political parties and organisations specialising in ecology;[25] and on the other hand, the horizontal forms specific to these movements seem to encourage empowerment and mobilisation. For studies about the music industries to become truly matters of public interest and to be credible, we believe that it is crucial that the public be actively involved in them. And as has been pointed out several times, this audience should be as variegated as Massive Attack's trip hop in terms of gender, social situation, location, territories, and mobility, racialized or not.

A genealogy of work

Like *Youth for Climate* or MDE, the editors and contributors of this special issue also belong to a genealogy of individual and/or collective works dedicated to ecological issues and, in particular, the relationship between music and ecology. Aside from the numerous works from the human sciences and life ecology, cited and discussed in the first part of this text, we would like to recall – again without claiming to be exhaustive – those who preceded and inspired us.

Without attempting to establish a chronology, let alone a hierarchy among the various branches of this prolific tree, we will begin by mentioning the researchers who, in the wake of and/or in parallel with Sound Studies, drew our attention to the sonic dimension of environments. Bernie

[25] While Greta Thunberg is indeed a kind of leader, she seems less to lead movements than to represent her generation.

Krause (2015 and 2016) has recorded many soundscapes, prepared exhibitions (2016 b) and proposed the idea that music was the form of sociability of animals, who had taught it to human beings (Ribac, 2016). On a similar note, other authors have investigated the contribution of animals to musical forms (Rothenberg, 2013; Taylor, 2017; Bruyninckx, 2018). Rothenberg and Ulvaeus (eds, 2009) have explored the links between music and nature, Farina (2014) has proposed the creation of a new field, called soundscape ecology, that will make it possible to describe the sonic dimension of the environment. Feld (2012) has shown how certain forest populations knew (particularly well) how to listen to the world. At the crossroads of Sound Studies and Sciences and Technology Studies, Bijsterveld (2008 and 2013) has proposed a socio-history of noises (and therefore to a certain extent of pollution) and their social meanings.

Ecomusicology has emerged as a new research field ~~was developed~~ in the mid 2000s. A series of articles, books, lectures and online discussions explored the ecological dimension of music and, conversely, reflected on the sound and musical dimension of ecology, understood as the science of environments, a systemic approach to phenomena and a commitment to a better world. Thanks to their familiarity with life sciences, social sciences and the various branches of Environmental Studies (and Environmental Humanities), a number of ecomusicologists have carried out an update of the relationship between music and ecology, thus contributing to the emergence of numerous problems and fields (Titon 2009 & 2016; Allen, 2011 & 2012; Pedelty 2012; Von Glahn, 2013; Allen & Dawe eds, 2017). We note here that within this galaxy, David Ingram (2010) first laid the ground for the ecocriticism of North American popular music.

Other authors have addressed the issues of sustainability and resilience. Schippers & Grant (eds, 2016) have explored how different types of repertories and musical practices could endure and contribute to the stability of societies. This theme has also been addressed by Wolcott (2016) and has been reviewed by Kirchberg & Kagan (2016). While the material dimension of musical practices has been studied by many authors (for example, Dawe (2017) on string instrument making), the history of shellac, derived from the resin produced by an insect in Northern India and used in manufacturing

records until WWII, enabled Smith (2015) and Devine (2015) to propose systemic approaches to sound reproduction. Although they are different, the great merit of these two works is that they capture in the same movement materials, entities, territories, different types of living beings, as well as traditional and modern industries. We would like to mention that a group of researchers, including the authors of this paper, spent three years (2016-2019) investigating the ways in which the world of music and music studies could deal with the Anthropocene. In particular, the group researched the production of musical instruments (Ballereau et. al, 2018) and the narratives of the Anthropocene (Ribac 2016 and 2019).

The contributions of this special issue

The six contributions to this special issue, *Popular Music and the Anthropocene*, mostly reflect the themes presented and discussed in this paper: the material dimension of practices and technologies, frequent recourse to history, the implementation of fieldwork to identify the players and actors and controversies, the importance of collaborative approaches, and music as a tool for understanding. Eliot Bates, Matt Brenann and Kyle Devine, Philipp Kohl and Élodie A. Roy examine the materiality of musical practices in terms of creation, production and consumption. They focus in particular on materials, substances used in recording technology, musical instruments and media (radio, film, video, recorded music). Some of these authors show the ecological footprint and the resulting waste, while others also expose the market rationale and human exploitation.

In several contributions here, practices, repertoires, continental exchanges, and circulations are studied thanks to the collection and meticulous analysis of archives. For Élodie A. Roy, Brennan & Devine, and Kohl, the plunge into the past brings out immanent rationales, long-term trends and even reveals the link between certain objects and geological time. Other contributors conducted fieldwork: Mark Pedelty, Rebecca Dirksen, Tara Hatfield, Yan Pang and Elja Roy carried out their studies in the four corners of the world in specific territories and cultures and in collaboration with groups, individuals, inhabitants, and artists. In each case, the aim was to document local ecological problems through videos, recordings and compositions. It is therefore also the way of conducting an

investigation that this group has experimented with. Bates has (re)traced the geography, economy and circulations of mining extraction and the electronic industry, and takes us into the integrated circuits of machines. Like Brennan and Devine, Bates' research led him to investigate the worlds, work, and entities that are usually neglected by musical studies. Kate Galloway, Élodie A. Roy and Kohl focus primarily on the works (installations, music productions, films, albums, clips, etc.) and figures of artists. What they observed and listened to have enabled them either to document how artists express themselves with respect to environmental issues, or to include these practices, objects and repertories in a sort of critical genealogy of modernity. Generally speaking, the performance and its inclusion in different types of media (video clips, cinema, records, mixed installations) is very present in the analyses, either as a material that is "deconstructed" and made to speak, or as a research tool.

Clearly, all the contributing authors take us to different parts of the world, at different times, evoking cultures, beings, varieties of objects and often from a decolonial perspective. Readers will no doubt notice that some authors have discussed or even criticised the concept of the Anthropocene and mobilised other approaches while others have not. Likewise, popular music appears sometimes through the lens of the devices and spaces where it is produced, listened to and watched, and sometimes through the medium of repertoires and artists or instruments and machines. To those who are surprised at the heterogeneity of these approaches, at the fact that some of the concepts used are at odds with our own opinions or with definitions that are generally agreed upon, we reply that while it is indeed urgent to act, it is just as fundamental to experiment with methodologies, to explore new areas and to engage continuously in debate. We hope that, like us, readers will appreciate all the avenues opened up by the contributors to musicalise ecology and to green popular music.

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