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REVIEW ARTICLE



Pandemics in the age of the Anthropocene: Is ‘planetary health’ the answer?

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ABSTRACT

Some observers have described the coronavirus pandemic as an ‘Anthropocene disease,’ thereby highlighting its connection with this new ecological era that is characterised by the considerable pressure human activities are exerting on ecosystems and the consequences on public health, society and the environment. This article focuses on the recent emergence of the ‘Planetary Health’ paradigm. Launched by the Rockefeller Foundation and the medical journal *The Lancet*, Planetary Health is one of the most ambitious attempts in recent years to systematize global health in the Anthropocene. While recognising the interest and necessity of reflecting on human health and the health of the planet, this article aims to show, however, that the Planetary Health paradigm is problematic and aporetic for two reasons. First, because it is based on a scientific and depoliticised conception of the Anthropocene, which obscures capitalism’s responsibility for the contemporary global and, especially, ecological crisis. Second, because this conception leads to a promotion of solutions that are essentially based on the financialization and technoscientific management of the living world – precisely the underlying cause of the degradation of ecosystems and living conditions that created the Anthropocene in the first place. A different kind of ‘planetary health’ remains possible and desirable.

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Introduction: Anthropocene pandemics

If there is one lesson that the SARS-CoV-2 pandemic is teaching us, it is that we can no longer perceive human health as separate from that of the planet. This world-wide crisis that we are now living through is indeed revealing how global health, the climate crisis and capitalist globalisation are inextricably linked. Some observers have described the coronavirus pandemic as an ‘Anthropocene disease,’ thereby underscoring its connection with this new ecological era characterised by the considerable pressure that human activities are exerting on ecosystems and the consequences on public health, society and the environment. As French microbiologist Philippe Sansonetti points out,

[these epidemics] stem from taking control of the planet and the footprint that humans are leaving on it. What is valid for the climate and the environment is also true for infectious diseases, especially emerging ones. These three things are linked. (Sansonetti, 2019) [translation]

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Although this observation is now generally accepted and widely shared, our understanding of the tangible connection between human health and the health of the planet, the forms this connection can take and the ways in which it can manifest is still in its beginnings. How can we think about and concretely implement a ‘beyond-human health’ that is capable of integrating the now central issue of ecological health? In other words, can we adopt new ways of conceiving of and materialising global health in the Anthropocene? For over a decade, a number of initiatives have been responding to this central challenge of rethinking global human health through the lens of its essential connection with the health of ecosystems. This includes the field of EcoHealth and One Health, a large-scale initiative promoting an integrated and unified approach to public, animal and environmental health. However, the recent emergence of the ‘Planetary Health’ paradigm, an initiative of The Rockefeller Foundation and the medical journal *The Lancet*, has been one of the most ambitious attempts in recent years to systematize global health in the Anthropocene.

Our article will focus on describing and analysing this paradigm, as proposed by The Rockefeller Foundation and *The Lancet*. Since COVID-19, the term ‘planetary health’ has been used in a more general sense, in a way almost synonymous with global health, and without explicit reference to the paradigm. In the following pages, our use of ‘Planetary Health’ refers directly to the specific paradigm whose origins we will be exploring and whose solutions and propositions will be analysed in regard to this genealogy. It should also be noted that the ‘planetary health’ perspectives, as represented in a journal such as the *Lancet Planetary Health*, might be very diverse, from Marxist eco-feminist analysis (Mair, 2020) to bioeconomy promotion call (Haines, 2021). While acknowledging this diversity of perspectives, our aim is not to account for all that is written under the ‘planetary health’ banner, but to propose a deconstruction and critique of the ‘Planetary Health’ paradigm, focusing on its founding texts and on the literature produced by the Rockefeller Foundation.

Aiming to broaden the scope of public health, which has traditionally focused on the health of populations without necessarily considering how health is linked to environments and ecosystems, the Planetary Health paradigm was officially proposed in 2014 and defined along with the publication of *Safeguarding Human Health in the Anthropocene Epoch* (Whitmee et al., 2015). Comparing major advances in public health since the 1950s and the pressure exerted on the Earth’s biophysical systems over this period, the report advocated for a redefinition of the principles underlying public health based on a consideration of the planet’s ecological limits. COVID-19 pandemic demonstrates more than ever the relevance of this broad approach to health, one that thinks about health in relation to the ecological issues of the Anthropocene. In fact, disregarding the impact of human activities on the environment and the planet places us at risk for increasingly disastrous health and ecological consequences.

The question remains, however, as to whether the Planetary Health paradigm can formulate a response that can truly meet the climate and health challenges of this new era. On what conception of the Anthropocene does the Planetary Health paradigm base its rethinking of global health in the face of climate change and pandemics? What modes of intervention does the paradigm promote? And what are its limits and/or omissions? As we seek to demonstrate in this article, while the Planetary Health paradigm can be applauded for reframing global health from an Anthropocene perspective, it nevertheless proves to be problematic and aporetic for two reasons. First, because it is based on a scientific and depoliticised conception of the Anthropocene, which obscures capitalism’s responsibility in the contemporary global and, especially, ecological crises. Second, because this conception allows for a promotion of solutions that are essentially based on the financialization and technoscientific management of nature, living organisms and human health – precisely the underlying causes of the degradation of ecosystems and living conditions that created the Anthropocene in the first place.

In the first part of the article, we describe and analyse the promise of the Planetary Health paradigm in the era of climate change. In the second, we highlight the problematic conception of the Anthropocene on which the paradigm is based and, in particular, the essentialization of this new era that it promotes which prevents any questioning of deep, underlying social and political causes.

In the article's third and final part, we show that the paradigm's scientific approach to understanding the Anthropocene ultimately contributes more to the 'resilience' of the capitalist world than to a necessary questioning of the capitalist model and therefore impedes the achievement of global ecological health. Establishing more equitable, democratic and sustainable global health in the Anthropocene requires questioning both the capitalist-productivist model and its instrumental relationship to nature and the living world.

1. Health in the age of climate change: The promise of the planetary health paradigm

Our aim is to respond to the threats we face: threats to human health and wellbeing, threats to the sustainability of our civilization, and threats to the natural and human-made systems that support us. Our vision is for a planet that nourishes and sustains the diversity of life with which we coexist and on which we depend. Our goal is to create a movement for planetary health.

These are the opening words of 'From public to planetary health: a manifesto,' published in 2014 in the *The Lancet* (Horton et al., 2014). A joint initiative of The Rockefeller Foundation and the British medical journal *The Lancet*, the Planetary Health approach is the product of a commission held in 2014 at the Bellagio Center that brought together 15 researchers and policy makers from a wide variety of fields, ranging from medicine to biodiversity. The ambition of its creators was to inaugurate a new field of public health, one that would no longer separate human health from the health of the planet. Planetary health has been defined as 'the health of human civilization and the state of the natural systems on which it depends' (Whitmee et al., 2015, p. 1978).

Yet this broadened conception of health is not entirely new. In fact, it is in line with efforts to broaden the understanding of human health that have been ongoing for several decades, of which the initiative One Health represented a major step forward when it was created in the early 2000s. One Health is 'the collaborative efforts of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals and our environment,' according to the One Health Initiative Task Force (OHITF, 2008, p. 3). This approach has enabled the integration of other bodies of knowledge that have previously not been linked to human health, notably veterinary health and environmental health. One Health research has thus mainly focused on zoonoses and human health relationships with wild and domestic animals. Its aim is to better handle emerging diseases with pandemic risk, in particular by considering animals as carriers of disease and therefore sources of risk for human environments.

Despite the One Health approach's claim to promote collaboration between diverse scientific communities, it remains strongly dominated by the veterinary and medical sciences. It has been criticised for its anthropocentrism, its disproportionate focus on human health and its negative view of nature (often presented as a reservoir of pathogens), all of which reproduce the idea that humanity must protect and extract itself from nature (Antoine-Moussiaux et al., 2019; Kamenschikova et al., 2019; Walzer, 2017). Responding to the accusations of anthropocentrism while reaffirming its primary focus on organisational and security issues, some advocates of the One Health model have begun transitioning in recent years to preparedness, not only for the spread of infectious diseases, but also for environmental changes. This reconfiguration seems to be enshrined in the adjective 'planetary' that Rabinowitz et al. call for in the editorial 'A planetary vision for one health,' published in *BMJ Global Health* in 2018: 'Adopting the planetary vision for One Health will help to better connect ongoing global health efforts in disease control and preparedness to larger underlying and pressing issues of environmental change, equity and sustainability' (Rabinowitz et al., 2018).

While in keeping with certain aspects of the One Health paradigm, the Planetary Health paradigm differs, however, in its additional effort to broaden the understanding of health to the issues raised by the climate change and the depletion of natural resources that characterise the Anthropocene. While One Health arose in response to the threat of pandemics caused by the SARS and avian

flu viruses in the early 2000s, the Planetary Health paradigm, by contrast, emerged in response to the considerable worsening of the environmental crisis by the pressure exerted by human activities on the planet. In other words, the Planetary Health paradigm stands out in its effort to recast health in relation to this new and unstable geological era, the Anthropocene:

The concept of planetary health is based on the understanding that human health and human civilization depend on flourishing natural systems and the wise stewardship of those natural systems. However, natural systems are being degraded to an extent unprecedented in human history. (Whitmee et al., 2015, p. 1974)

The report *Safeguarding Human Health in the Anthropocene Epoch*, which came out in 2015 and is the seminal work that defined Planetary Health, recognises the paradoxical relationship between the major advances in public health since the 1950s and the pressure exerted on the Earth's biophysical system that have led to the degradation of ecosystems beyond sustainable conditions. The overall health gains of recent decades may be lost, the authors warn, with the deleterious consequences of environmental change:

We have been mortgaging the health of future generations to realize economic and development gains in the present. By unsustainably exploiting nature's resources, human civilization has flourished, but now risks substantial health effects from the degradation of nature's life supports systems for the future. (Whitmee et al., 2015, p. 1973)

Although, as the report states, the effects of global environmental transformations on human health are difficult to quantify, as they are non-linearly linked within complex systems, they nevertheless compromise human health, social and economic progress by degrading vital 'ecosystem services' (Whitmee et al., 2015, p. 1976). In other words, the new horizon of human health must take into account the limits of the planet.

More specifically, the report argues for greater consideration of humanity's dependence on the natural environment and its crucial role in supporting human development and well-being. This requires, first and foremost, a broader understanding of health and human societies, which must no longer be conceived of in isolation from nature and living beings. Although the report focuses mainly on the outcomes for humanity, it does indeed resituate humans explicitly in the natural environment, placing them 'within a wider interspecies and biophysical environment that can include such things as air and ocean currents, landscapes, microbial growth and adaptation, chemical flows, and climate imbalance that bear on human health' (Farman & Rottenburg, 2019, p. 4). For the authors, natural environments and human social systems can no longer be understood independently of each other but are instead interrelated: 'Natural systems do not exist without people and social systems cannot exist totally in isolation from nature. These systems are truly interconnected and coevolve across spatial and temporal scales' (Whitmee et al., 2015, p. 1975).

Second, consideration for humanity's dependence on the natural environment calls for a redefinition of the moral commitment of global health to protecting future human generations. Indeed, the report frames the relationship to future generations directly as a justice issue:

Several justice theorists have advanced the view that the present generation has a moral duty to protect the health and wellbeing of future generations on the grounds that the basic rights of people in the future include health, subsistence, and survival, which could be violated by major rises in temperature and other environmental changes. (Whitmee et al., 2015, p. 2007)

Planetary Health therefore recognises the tension between economic development of societies and human health, not only in spatial terms but also in temporal terms, i.e. in relation to the future (Farman & Rottenburg, 2019, p. 4). World health is hence redefined, adding to the spatial scale a temporal dimension that no longer targets the current health of distinct populations, but rather the future health of a unified humanity. Human time is then being brought into perspective alongside the more general time of the planet and its limits.

2. Planetary health and the dissemination of a depoliticized Anthropocene

The Planetary Health paradigm contributes to broadening our understanding of human health by thinking of it in relation to this new Anthropocene era, i.e. by taking into account the considerable and harmful impact of human activities on the health of the planet and, consequently, on the health of human beings. However, as ambitious as it may be, this promise is based on a problematic conception of the Anthropocene that is both scientific and depoliticised. The notion of the Anthropocene, popularised by researchers Paul Josef Crutzen and Eugene Stoermer (2000) and since extrapolated from the natural sciences to the social and political sciences (Beau & Larrère, 2018; Bonneuil & Fressoz, 2016), aptly highlights the global consequences of current human activities. It attests the extent to which phenomena like global warming and the emergence of new epidemics are not in fact ‘simple’ or ‘natural’ phenomena. They are also and mainly ‘social’ phenomena insofar as they are the product of human action on the planet.

a. A scientific vision of the Anthropocene

By mobilising the notion of the Anthropocene – ‘the proposed name for a new geological epoch demarcated as the time when human activities began to have a substantial global effect on the Earth’s systems’ (Whitmee et al., 2015, p. 1975) – the Planetary Health report underscores the seriousness of the current ecological situation while also recognising human involvement in this situation. Nevertheless, it tends to spread a scientific and essentialistic conception of the Anthropocene, which contributes to depoliticising the social, ecological and health issues we are facing. Largely dominated by the natural sciences, the report is based on the governance model of ‘Planetary Boundaries’¹ (Rockström et al., 2009), which measures Anthropogenic effects within a quantifiable system containing nine boundaries² delineated in relation to the pre-industrial era (the Holocene), with the aim of defining a ‘safe operating space’ for the development of humanity. As the article’s authors summarise: ‘... planetary boundaries define, as it were, the boundaries of the ‘planetary playing field’ for humanity if we want to be sure of avoiding major human-induced environmental change on a global scale’ (Rockström et al., 2009).

Arising from the natural sciences, this conception of the Anthropocene is not neutral. It sets the stage for a narrative in which humanity, taken as a whole and as a global geological force, is placed in juxtaposition to a planet seen as a set of systems. This disembodied vision outlines a ‘planetary imaginary’ that is both universalising and overshadowing, and which tends to erase the highly differentiated geographical and social manifestations of the Anthropocene (Fernando, 2020). These now widely used planetary boundaries were essentially established using measures based on a principle of commensurability that erases cultural, regional and national differences and reduces the diversity in ways that humans represent and relate to nature (Farman & Rottenburg, 2019). In other words, this scientific conception spreads a desocialized vision of the Anthropocene that does not consider the differentiated impacts through which this era is manifesting itself – in particular on non-Western cultures, which are the first to be affected by climate change.

This scientific conception of the Anthropocene also implies that planet Earth is defined as a set of systems that need to be piloted and governed, even technically reengineered or redesigned. In other words, the prevailing conception of the Anthropocene is less conducive to acknowledging the fragility of our world and of nature, and more conducive to taking control in order to push back the limits. By rigidly erecting a space that is scientifically delimited by planetary boundaries, the Planetary Health approach nourishes the Promethean desire to push back these limits rather than forcing us to see them as an opportunity to build a different relationship with the living world. In fact, most of humanity has never put an impermeable boundary between humans and nature, and this scientific view reinforces a Western representation of our relationship to nature, which is founded on mastery, as we shall see later. The conception of the Anthropocene that

prevails here leads to a ‘scientific management’ of the Earth system (Stubblefield, 2019, p. 17), which ultimately sums up the issue of planetary health as a technical ‘preparation’ for the Anthropocene³ (Stubblefield, 2019, p. 17).

b. Anthropocene or Capitalocene?

While the scientific conception of the Anthropocene promoted by the Planetary Health paradigm tends to erase its highly differentiated social and geographical manifestations, it also obscures the deep historical and political causes of the planetary upheavals at the root of this new era. More specifically, it erases the responsibility of the capitalist-productivist model and the accompanying instrumental relationship to nature and living organisms. The report aggregates many toxic human actions, such as deforestation, species extinction and environmental pollution, but always so as to reinforce the responsibility of a humanity that has been raised to a global geological force: ‘Humanity has become a primary determinant of Earth’s biophysical conditions, giving rise to a new term for the present geological epoch, the Anthropocene’ (Whitmee et al., 2015, p. 1976). In other words, as Farman and Rottenburg rightly argue, Planetary Health entirely excludes from its conception of the Anthropocene the era’s intimate connection with capitalism. They write:

Who mortgaged the future? Whose current level of development? Whose future health? Although the disproportionate distribution of externalized harms to poor people around the world is gestured at (and an independent opinion piece in the journal vaguely points the finger at ‘neoliberalism and transnational forces’ [Horton et al., 2014, p. 847]), the official reports refrain from even mentioning capitalism, overconsumption, extractivism, corporate profits, or wars and global militarization. (Farman & Rottenburg, 2019, p. 2)

Yet, as a considerable body of research shows, it is not humanity in a generic and abstract sense that is responsible for contemporary ecological devastation. Rather, it is the capitalist model of society centred on unlimited growth and the ever-more intensive exploitation of natural resources that is to charge. In other words, incriminating humanity masks the responsibility of the productivist Western model and contributes more often than not to stigmatising the world’s most vulnerable populations. As the French researcher Christophe Bonneuil asks:

[...] who is this ‘anthropos’ derailing Earth’s geological trajectory? An undifferentiated ‘human species’? Whose galloping demography makes it possible to blame one and all, especially the poor and the racialized? Until very recently, the Anthropocene was in fact a Westernocene! By 1950, North America and Western Europe were responsible for nearly three-quarters of all greenhouse gases emitted since 1750. While the human population has risen by a factor of 10 over the last three centuries, capital increased by a factor of 134 between 1700 and 2008. Is it not this logic of accumulation that has driven the entire dynamic behind the Earth’s transformation? (Bonneuil, 2017) [translation]

For some researcher ‘Capitalocene’ would be a more appropriate term than Anthropocene, underscoring as it does the responsibility not of humanity as a whole but of a specific economic and political system for the current degradation of the planet, particularly when it comes to global health issues (Angus, 2016; Malm, 2016; Moore, 2016).

Indeed, it is well known that the degradation of the environment and the living world, which is due to the increasingly unchecked exploitation of nature and is driven by excessive growth objectives, is now responsible for the emergence or worsening of many health problems around the world. The harmful effects of the productivist model on the health of the planet and of human beings are increasingly obvious in many areas: pollution (Davis, 2003; Fortun, 2001; McGurty, 2007; Murphy, 2006) and endocrine disrupters (Frickel, 2004; Langston, 2010, 2014; Murphy, 2013); chemical pesticides (Carson, 1962/2002; Nash, 2004, 2006; Harrison, 2011); radioactive emissions (Brown, 2013; Iversen, 2013; Petryna, 2002); antibiotic resistance (Landecker, 2015; Levy, 1992; McKenna, 2017); and pandemics (Shah, 2016; Wallace, 2016, 2020a, 2020b). If not questioned at their very roots, all these problems become effects to be managed technically rather than realities

that call into question the social and political organisational models underlying our societies and the relationship to the world and nature promoted by these models.

Far from a natural phenomenon that is external to human activity, the COVID-19 pandemic is a stunning and tragic manifestation of the role of the capitalist-productivist model plays in ecological and health ravages. Rob Wallace highlights this well: ‘Ecosystems in which such ‘wild’ viruses were in part controlled by the complexities of the tropical forest are being drastically streamlined by capital-led deforestation and, at the other end of periurban development, by deficits in public health and environmental sanitation’ (Wallace, 2020a). Although a key consideration, the capitalist model’s responsibility for environmental degradation and the emergence of related health problems is not explicitly invoked in the Planetary Health report. A new conception of global health that is capable of meeting the challenges of today’s climate and health issues should precisely highlight its deep social and political structural roots.

3. Planetary health and its techno-financial ‘resilience’ at the expense of ecological and democratic health

This depoliticised and desocialized conception of the Anthropocene on which the Planetary Health paradigm is based ultimately leads its proponents to advocate for a model of action that is oriented not towards the political and ecological questioning of our world – in particular the capitalist-productivist model underpinning the problems of the Anthropocene – but rather towards its ‘resilience’. In the report and numerous articles, the ecological crisis is presented as both an emergency and an opportunity calling for a rapid strategy of action (Biteye, 2017; Japra & Onike, 2017; Rodin, 2015a, 2015b). ‘Resilience’ is therefore the capacity to transform this threat into an opportunity: ‘We have the opportunity to define this age as an age of extinction or an age of resilience. With a focus on planetary health, we can – and we must – choose the latter’ (Rodin, 2015a). ‘Resilience’ is therefore the watchword of the report and also of the planetary movement; by anticipating these uncertain threats, it aims to prepare individuals, communities, and health systems in developing countries for the natural shocks and stresses caused by human activity: ‘Resilient health systems seek to anticipate new threats, both known and unknown, and proactively plan ahead, while at the same time making sure that the most imminent threats to the system and the populations they serve are still addressed’ (Japra & Onike, 2017).

This ‘resilience’ is put into practice by mobilising capital and technological development, more specifically biotechnological development. In other words, ‘resilience’ is the keyword in a strategy essentially centred, as we shall see, on the economic financialization of health and the technoscientific control of the living world. As Farman and Rottenburg point out:

Looking at the recommendations and projects emanating from the commission founded in 2014 at the Bellagio Center and the health organizations, researchers, and coalitions that have taken up the ‘planetary health’ mantle (including Panorama, the Gates Foundation, the University of California, and One Health), it is hard not to note the prominence of the private sector, the call for corporate involvement, the use of finance mechanisms, the increased focus on surveillance mechanisms, and the (re)turn to technofixes and advanced technoscientific approaches via nanotechnology, geoengineering, satellite imaging, algorithmic prognostications based on big data, and a range of other digital or computational techniques. (Farman & Rottenburg, 2019, p. 6)

a. Capital to the planet’s rescue

While the Planetary Health report only introduces the idea of using finance to improve global health, much subsequent published work, notably the Milken report (2020), presents financing and the use of capital as key levers for action. The mobilisation of philanthropic capital is suggested as central to implementing Planetary Health-based solutions. But other types of capital mobilisation are also put forward, notably via the globalised financial system. Moreover, the report of the Secretariat of the Rockefeller Foundation Economic Council on Planetary Health is entirely dedicated

to this theme of integrating Planetary Health into the global financial system (Chenet, 2019). The report stresses that global health must mobilise a new source of capital– ‘impact financing’ (or ‘innovative financing’) – if it is to meet the United Nation’s Sustainable Development Goals:

Beyond pure philanthropy, some innovative financing schemes involving philanthropic funding coupled with impact investing have recently emerged, notably on nature conservation. Such approaches rely on structuring investments that provide outcome on nature as well as a financial return, direct or indirect. (Chenet, 2019, p. 3)

In this context, the tangible application of Planetary Health involves breaking down into a set of financial assets, which the Foundation then groups into an eco-responsible portfolio called Zero Gap:

A core value of Zero Gap is that finance can be a powerful tool for good. Imagine a forest resilience bond investing in wildfire prevention in California; a micro-levy that creates a stable funding stream for alleviating malnutrition in Africa; or insurance being harnessed to not only respond to the next Ebola crisis, but also to ensure better preparation for disease outbreaks. (Rodin & Madsbjerg, 2017, p. 2)

In the Zero Gap portfolio, we see: the Forest Resilience Impact Bond (Madsberg & Connaker, 2015; Rodin, 2015c), which aims to raise funds from private investors to finance forest restoration and thereby reduce the intensity and frequency of fires; Disaster Impact Bonds, which are intended to encourage loans by microfinance institutions to alleviate the burden on African countries affected by increasingly devastating climatic disasters (Rodin, 2015c); and African Outbreak and Epidemic Insurance (or African Risk Capacity), which aims to help African countries contain the spread of viruses at the first signs of disease emergence (Barrios, 2018).

Within this market model of Planetary Health, environmental and health risks are redefined as commodities and abstract representations on which speculation and financial risk-taking is encouraged in order to create a derivatives market. Presented as a ‘win-win’ solution, this financialization would make it possible, according to its proponents, to support environmental conservation and promote global health (by attributing a value to ecosystem services) while fostering economic growth (by creating new marketable assets). However, by linking environmental and health issues to economic growth, these financial solutions block the establishment of an ecological health that requires precisely the opposite – a breaking free from the finance-driven reasoning that has led to an ever-increasing exploitation of the planet’s resources. Planetary Health is therefore making this financialization appear to be the best course of action for the planet and human health when, in fact, it is the basis of the unchecked exploitation of resources, itself creating in large part the conditions conducive to the emergence of epidemics.

In addition to fuelling the mechanisms at the very root of the Anthropocenic degradation of the planet, these financial solutions also raise democratic issues. Pandemic bonds are a perfect example of these global financial solutions to pandemic risk. Indeed, these pandemic bonds, which were developed in 2017 by the World Bank Treasury in cooperation with the major reinsurance companies Swiss Re and Munich Re, are designed to encourage investors to assume part of the cost of controlling future epidemics (World Bank, 2017). This system, which offered premiums of 11.5% or 6.9% to investors (with Japan and Germany first in line), runs counter to instituting democratic global health as it replaces collective and citizen deliberation with mechanical disbursement processes stemming from a globalised financial logic (Erickson, 2015; Stein & Stridhar, 2017). Such mechanisms proved ineffective during the Ebola epidemic in the Democratic Republic of Congo in 2018 (Garrett, 2019; Lachenal, 2019), where the lack of democratic discussion on disbursement criteria was obvious (Erikson & Johnson, 2020). This financialized model of global health based on preempting the future in the name of epidemic scenarios prevents the establishment of a truly democratic global health, which, on the contrary, presupposes constructing the future politically through collective deliberation.

b. Redefining the planetary boundaries through biotechnology

The financialization of the environment and of pandemics at the heart of Planetary Health is also inseparable from its problematic instrumental relationship with nature and the living world. Along with finance, the technosciences are another way in the Planetary Health paradigm for harnessing nature and the living world assimilated into forms of capital. Throughout the report, technology therefore plays a predominant role in making more effective use of natural resources and/or in rationalising individual behaviour toward sustainable practices. In response to population growth and declines in arable land the report proposes for example the application of various ‘ecological intensification strategies’ to optimise soil productivity and preserve biodiversity compared to traditional methods of agriculture (Whitmee et al., 2015, p. 1998). These intensification activities that the report suggests for low-income countries therefore relate to both ecological intensification (conservation agriculture, agroforestry and integrated pest management) and genetic intensification (the genetic optimisation of plants and livestock). These strategies draw directly on technoscientific innovation.

In particular, the report explicitly states its belief in technoscience’s capacity to optimise living organisms and extend their limits. The report’s mention of the use of biotechnology to improve seeds is telling in this respect:

Innovation is an important component of each of these sustainable agricultural intensification strategies. For example, plant performance can be improved through molecular breeding, use of companion plants, and genetic modification. A report published in 2014 suggests that no evidence exists that genetically modified crops are unsafe for human consumption but it was not a systematic review. If these technologies are to make a useful contribution to the reduction of global hunger they have to both protect the environment and be accessible to farmers in low-income settings, otherwise inequities will persist and increase. (Whitmee et al., 2015, p. 1998)

In fact, the assertion that there is an absence of data on the adverse effects of GMOs on human health is questionable (Landrigan & Benbrook, 2015). Furthermore, the literature indicating there is no consensus on the environmental safety of GMOs (Hilbeck et al., 2015) should also be considered with a view to respecting the limits of the living world we still know little about. The perniciousness of these technoscientific solutions appears all the more obvious when they are presented as desirable solutions when, in fact, their long-term effect is at best unknown and at worst the root cause of the increased virulence of pathogens.⁴ Contrary to the ecological perspective that is responsive to limits, this technoscientific conception encourages pushing these limits ever further. In this way, the now widely used ‘Planetary Boundaries’ at the basis of the Planetary Health paradigm appear less as limits not to be overstepped than as an opportunity to develop new technoscientific and biotechnological innovations (Goldstein, 2018; Goldstein & Johnson, 2015; Nelson, 2015). Although one of the structural causes of the Anthropocene, productivism finds itself reaffirmed as the favoured vector of ‘resilience’.

Another illustration of this instrumental relationship to life is the genetic modification of disease vectors, such as mosquitoes, to prevent disease in humans. Philanthropic foundations whose work revolves around Planetary Health, such as the Gates Foundation, are developing ambitious projects for genetic modifying the environment and living organisms in an attempt to find solutions to global health problems. Using gene drive organisms (GDOs), groups like Target Malaria, a non-profit research consortium run by Imperial College London and funded to the tune of US\$75 million by the Bill and Melinda Gates Foundation (Regalado, 2016), assert that the deployment of modified mosquitoes in Africa can help control one of the leading causes of mortality worldwide.

These biotechnological solutions raise concerns for democratic process. As Mariann Bassegrovwuje, Jim Thomas and Tom Wakeford note:

Not only are the benefits from GDOs based, like their predecessors, on flawed ecological thinking, they are backed by the same agri-business interests that have devastated agroecological farming systems. The rights of communities to say ‘no’ to new genetic technologies is being eroded, despite United Nations agreements,

such as the Convention on Biological Diversity, which call for the free, prior and informed consent of affected communities to be respected. By exporting their field trials to countries with weak regulatory regimes and lowering of the standards of consent, the Gates Foundation's Target Malaria project has already been guilty of ethics dumping. (2019, p. 121)

Moreover, these solutions create a dependency on private companies, which have their own objectives, i.e. to optimise their own biotech products and gain market share. Most notably, the latter are world health-related markets that are supported by the international funds in which philanthropic foundations are stakeholders in the commercialisation of biotechnological products that they themselves have helped develop (Bereano, 2017). These development and investment circuits bypass all local democratic deliberation and reinforce the dependence of less powerful countries on international institutions supported by philanthropic foundations and their technoscientific solutions. As the executive director of the African Centre for Biodiversity (ACB) explains:

The Target Malaria project represents the latest version of a top-down approach rooted in a bygone era of colonial medicine that laid the foundations for global health policies. It yet again focuses narrowly on technologies, while strategies that focus on wider determinants of health, such as investments in national health services, are being neglected, despite their critical influence in past global successes. (ACB, 2018)

Furthermore, such biotechnology projects are not only spectacular; they also raise more fundamentally the issue of the problematic relationship to the living world that underlies the Planetary Health paradigm. Far from perceiving the living world (whether human or non human) with its own limits that must be ecologically respected, such projects aimed at genetically modifying living organisms to improve health actually contribute to erasing limits and boundaries in a kind of global biotechnological indifferentiation so 'technonatures' become the very source of accumulation (Goldstein & Johnson, 2015; Nelson, 2015; Smith, 2007). The boundaries at the basis of the Planetary Health paradigm are thus partly redrawn and hybridised in the form of living and non-living entanglements that efface living beings finitude and dilute the responsibility of the productivist capitalist social framework, while simultaneously promoting the technoscientific approaches at the core of environmental degradation. As the economist Geneviève Azam foreshadows, it is precisely in this indistinction and biotechnological mixing of genres that 'human responsibilities are blurred and cancel each other out through naturalization' (Azam, 2020, p. 65) [translation]. Through this technoscientific redefinition of planetary limits, Planetary Health ultimately pulls off the *tour de force* of redefining the planet to match its own ambitions; those of the capitalist technoscientific model. From this perspective, the paradigm, in its very conception and solutions, is in line with the 'neoliberal counter-revolution' described by Smith (2007) and Nelson (2015).

Conclusion: Another planetary health is possible

In the age of the Anthropocene, the Planetary Health paradigm seems to propose an ambitious conception of health, one that is conceived to extend beyond humanity. By recognising the link between human health and that of the planet, this paradigm makes it possible to understand epidemics and pandemics taking into account the biological, environmental and social factors that shape their emergence and spread. However, based on a depoliticised and ahistorical conception of the ecological crisis, it naturalises capital and the technosciences, and comes to consider nature in turn as something that can and should be improved through financial strategies and the engineering of the living world. Instead of focusing on limits—physical and natural, moral and political—that humanity could set in its relationship to nature and to itself, Planetary Health proposes instead to push these limits further through a techno-financial resilience that celebrates our ability to emerge from the crisis through a new cycle of capitalist accumulation. From this point of view, the Planetary Health paradigm ultimately leads to the opposite of its stated objective: to end the accelerated degradation of both human and environmental health.

If Planetary Health paradigm is not a satisfactory response to current health and ecological issues, however, it does not discredit the need to reflect now, more than ever, on human health

in its essential connection to the health of the planet. The health of human communities is intrinsically linked to the ecological environments that support them (Nash, 2006). But a different kind of ‘planetary health’ remains possible and desirable. Achieving this cannot be done by sidestepping a deep-seated questioning of the capitalist-productivist model of society and of the technoscientific and instrumental relationship to life and the living world that it promotes. Another, less obscuring conception of planetary health is possible – one that puts the establishment of democratic and ecological post-capitalist health above all else. This vision would place the capacity of participating populations to find solutions in an inclusive process at the centre of all interventions, and ground all discussions in an renewed attention and sensitivity towards the living world (Morizot, 2020), recognised in pluriversal approaches related to it (Blaser, 2016; Escobar, 2018) and so generate collective obligation. That is to say a vision that implies political responsibility, rather than technoscientific resilience.

Notes

1. The 2015 Planetary Health report appeared following the publication of the article ‘Planetary Boundaries: Guiding Human Development on a Changing Planet’ in the journal *Science* (Steffen et al., 2015).
2. Concerning climate change, the loss of biosphere integrity, land system changes, water use, biogeochemical flows, ocean acidification, atmospheric aerosol loading, stratospheric ozone depletion and the introduction of novel entities (toxic synthetic substances such as radioactive materials and nanomaterials).
3. For a critical analysis of the ‘preparedness’ paradigm in global health, see David and Le Dévédec (2019).
4. As Rob Wallace points out: ‘[g]rowing genetic monocultures—food animals and plants with nearly identical genomes—removes immune firebreaks that in more diverse populations slow down transmission. [...] However unintended, the entirety of the production line is organised around practices that accelerate the evolution of pathogen virulence and subsequent transmission’ (Wallace, 2020b, p. 69).

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