

THERE'S NOTHING NEW UNDER THE SUN – LESSONS CONSERVATIONISTS COULD LEARN FROM PREVIOUS PANDEMICS

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ABSTRACT

In many industrialised societies, the COVID-19 pandemic has been painted as an unprecedented moment caused by human abuse of nature. Responses to it have, in turn, temporarily slowed down human impacts upon nature. This has led to a rallying cry against human encroachment into what are claimed to be pristine wildernesses. Reflecting upon historic, archaeological and palaeoecological evidence relating to the impacts of past epidemics within a wider historical timeframe from Africa and South America, we show that though COVID-19 is a novel disease, the pandemic itself does not represent a novel event, since diseases brought by Europeans have previously decimated the peoples living in these areas. The ‘pristine wilderness’ is a myth, which falsely held that these places had always been empty of people, thus helping to legitimate the creation of protected areas, and their political control by both colonial and national administrations. We therefore question the assumption behind what has been termed the ‘anthropause’ – that the supposed reduction in anthropogenic activities caused by the current pandemic presents a new opportunity to study anthropogenic impacts on nature: numerous previous occasions exist where depopulation resulted in anthropauses. Such responses to COVID-19 suggest further interdisciplinarity is needed in the field of conservation, in spite of advances in this direction.

Key words: epidemics, pristine wildernesses, protected areas, history, archaeology, Africa, Brazilian Amazonia

“...the unhealthiest period in all African history was undoubtedly between 1890 and 1930” (Hartwig & Patterson, 1978, p.4)

“The white man brought measles and many people died” (Munduruku man in Melo & Villanueva, 2008, p.40)

DISEASES AND THE PRISTINE WILDERNESS

MYTH

“Surprise” is the title of a 2014 paper on emerging infectious diseases that asks why predictable new diseases, such as SARS, Ebola and HIV, catch us unprepared (Stephen et al., 2015); and why recent pandemics, such as the 1918 Influenza pandemic (Saunders-Hastings & Krewski, 2016) or the HIV/AIDS pandemic (Snowden, 2008) have been so quickly forgotten in Western societies. Yet previous pandemics are remembered in the oral histories of many local

communities around the world. Epidemiologists, such as the current US Director of the National Institute of Allergy and Infectious Diseases, Dr Anthony Fauci (in Morens et al., 2004) have also long warned of such a possibility.

While the development of new infectious diseases into pandemics is not novel, a publication often cited¹ by ecologists that numbers “335 emerging infectious disease (EID) ‘events’... between 1940 and 2004” has encouraged a belief that the number of EID events is escalating (Jones et al., 2008; Kilpatrick et al., 2017). But this dataset lacks historical depth, since the period it looks at excludes the consideration of the global spread of infectious diseases caused by empire building (e.g. Curtin, 1998; Hartwig & Patterson, 1978), the influenza

outbreak of 1918 (Patterson, 1979, 1986) and other pandemics that took place in the past (e.g. sleeping sickness – 1915-1926, cholera pandemics – 1817-1923, influenza pandemics – 19th century, bubonic plague pandemics – 6th to 20th century (see infographics in LePan, 2020; Byrne, 2008; Cunningham, 2008)). With greater historical context, it becomes harder to justify the claim by both media and some scientists that the emergence of new diseases and their impacts on “the environment and wildlife is a novel and understudied topic” (Manenti et al., 2020, p.2). This is best exemplified in a recent publication by WWF that uses the Jones et al. 60-year dataset to state that “over the last century, there has been an alarming increase in the number and frequency of new zoonotic disease outbreaks. The frequency of zoonotic disease outbreaks caused by a spillover of pathogens from animal hosts to people may have more than tripled in the last decade” (WWF, 2020, p.10), arguing that this “increase in zoonotic outbreaks is a symptom of a broken relationship between humans and nature, and is likely to worsen” (WWF, 2020, p.11), whereby the “devastating health impacts of recent pandemics including COVID-19 are a stark illustration of the human costs of the encroachment on nature” (WWF, 2020, p.24).

The idea that land use change constitutes a broken relationship with nature, which is driving infectious diseases, is evident too in the claim that the number of “published peer reviewed articles on land use change and diseases from the 1970s to the present increased markedly in the last decade” (Gottdenker et al., 2014). Land use change follows from the encroachment of “human activities (logging, mining, agricultural expansion, etc.) into wild areas and forests [...] and the commodification of wild animals (and natural resources in general) and an expanding demand and market for wild meat and live wild animals” (Volpato et al., 2020, p.1). Alarm at the speed and widespread nature of land use change – especially in tropical countries – is a key reason why conservationists and others argue for a more environmentally friendly world once the COVID-19 pandemic is over (Gatti, 2020; Khoury, 2020), and for a “transition to more sustainable societies” (Stegeman et al., 2020, p.1).

While few would argue against a more environmentally-friendly world, the discourse of a broken relationship is misleading, unless it acknowledges that the impacts upon the environment wielded by capitalist interests and industrial societies are very different to those of Indigenous peoples and traditional and local communities who depend directly upon these landscapes for their livelihoods and who may be

negatively impacted by industrial and capitalist forces as they often live at these frontiers of encroachment. There is indeed a vast corpus of interdisciplinary literature, including historical ecological approaches (see Szabó & Hédl, 2011), which shows how the presence of Indigenous peoples and traditional and local communities is not necessarily antagonistic to nature; in fact, it can have an environmentally beneficial impact on landscapes through certain kinds of management and plant domestication.

It would be unfortunate if this discourse (Schultz, 2011; Volpato et al., 2020) were to reinforce myths of pristine landscapes and Eden-like wildernesses (Adams & McShane, 1996; Denevan, 1992; Neumann, 2002) – *tabula rasas* (Aristotle, 2016, pp.60–61, gloss 430a; Duschinsky, 2012) untouched by human hands. In fact, many ecologists and conservationists have accepted that in most cases the pristine wilderness is just that: a myth. The “concept of ‘pristine’ forest is hardly appropriate in an era of pervasive anthropogenic change” (Ghazoul et al., 2015, p.623). As conservation has been transformed into an interdisciplinary subject, such a view of nature in a primordial state has been shown to be untenable². Of course, the coming of the Anthropocene epoch (Chua & Fair, 2019) and its impacts on the environment (Malhi et al., 2014) constitute a crisis without precedent. But the cause of this does not lie with those people who live in these encroachment frontiers (Rudiak-Gould, 2015).

While ‘pristine wilderness’ is a term employed for popular use, similar thinking underpins the more scientific terms like intact, old growth, undisturbed and primary forest. These terms are defined by ecological theories and data (for example Ahlström et al., 2020; Hubau et al., 2019; Lopez-Gonzalez et al., 2012) rather than historical, archaeological or even anthropological data. For example, Bauters et al. use ecological theory and old growth forest to date anthropogenic activity for site selection in the Democratic Republic of Congo by using the “expert judgment of local foresters” to age “different stages of forest development” (Bauters et al., 2019, p.2). Meanwhile Poulsen defines “Primary, or old growth, forest [...] as having no recent obvious signs of disturbance” (Poulsen et al., 2020, p.5). Though these terms may be accurate for their specific uses, the employment of ecological methods and data alone, or the direct observation of current human disturbance to determine past anthropogenic activity, are poor substitutes for archaeological, historical and anthropological methods and evidence.

The introduction of the concept of the anthropause (Rutz et al., 2020) builds upon this historical disconnection by suggesting that the events following

the current pandemic are, in some way, novel: that diseases such as COVID-19 bring about “an unusual decrease in human activity associated with partial and total lockdowns” (Silva-Rodríguez et al., 2020, p.1) allowing many animal species to enjoy “the newly afforded peace and quiet” (Rutz et al., 2020, p.1156). While this decrease in human activity may be true in some places, it is not universal (Walters et al., 2021). A now common saying in the Brazilian Amazon is that “Deforesters don’t do lockdown”, because loggers, wildcat goldminers and landgrabbers have intensified the invasions of protected areas at a time when monitoring operations have been suspended, with officials and communities unable to do any monitoring. Similar events have also occurred in various African countries, while the second 2020 lockdown in France does not apply to hunters.

PLACING ENVIRONMENTAL ENCROACHMENT AND DISEASE OUTBREAKS INTO HISTORICAL CONTEXT

Historians have long recognised the links between humans transitioning, or encroaching, into new environments and the subsequent emergence of diseases (e.g. McNeill, 1976; Morris, 2011). However, the results of past collaborative work between historians, ecologists and epidemiologists are insufficiently used because they are in books or older articles: today many scientists are disconnected from their own disciplines’ histories, since they prefer to use “new techniques of extracting literature through electronic means which filters out older material” (Reiners & Lockwood in Spinage, 2012, p.vi).

When hominid species left the forest and entered the savannas (ca. 2 million years ago), they encountered new tick and mosquito species and their associated diseases. The emergence of tuberculosis arose from an “assemblage of effects” (Herschel, 1831, p.166), which included the consumption of novel food sources and the increase in smoke-induced lung damage that arose from the social interaction of gathering around the fire (fire was mastered 300,000 – 400,000 years ago) (Chisholm et al., 2016, p.9053). When agriculturalists in the Fertile Crescent created permanent settlements (5,000 – 10,000 years ago), they made homes for scavengers and their diseases. When people domesticated wolves and other animals in the Old World, they brought novel diseases into their houses (Penakalapati et al., 2017) and into their meals. During the 50,000 – 100,000 years of global migrations and bridging of continental barriers, the movements of *Homo sapiens* have been accompanied by epidemics and pandemics (McMichael, 2004). All of these events would have had novel impacts

on “the environment and wildlife” (Manenti et al., 2020, p.2) both during the transition into new environments and after the emergence of the associated disease.

For conservationists, restricting our historical and environmental exploration of novel diseases to the last century³ not only limits understanding of ecosystems and of conservation, but also restricts our ability to generate “effective conservation policy” (Young et al., 2017, p. 3). In its correct historical context, Rutz’s call for the international research community to “use these extraordinary circumstances to gain unprecedented mechanistic insight into how human activity affects wildlife” (Silva-Rodríguez et al., 2020, p.1) is problematic, as it entails untangling the current effects of reduced human movement from previous historic “extraordinary circumstances”, besides other mitigating factors⁴.

Below we present data to suggest an alternative hypothesis. First, we summarise how the introduction of Rinderpest disease in Africa led to the creation of important protected areas in eastern Africa, something documented by an interdisciplinary team including ecologists in the Serengeti. We then document two historical cases of encounters of Europeans with Africans and with South Americans that led to the introduction of novel diseases for local populations which decimated Indigenous peoples, traditional communities and local communities who once lived in what are now protected areas in Gabon and Brazil. The former concerns relatively recent history from the 1800s, and the latter dates to the start of the first European expeditions to the Amazon in the 1500s. We show the connections between these processes and the subsequent construction of pristine wilderness myths, especially during the colonial era; and contend that these have become part of the way many erroneously understand the ecology and landscapes in these areas today (Fairhead & Leach, 1996; Walters et al., 2019).

THE 1887-1900 RINDERPEST PLAGUE AND THE CREATION OF PROTECTED AREAS IN EASTERN AND SOUTHERN AFRICA

Through popular wildlife documentaries, safaris and other Africa-oriented environmental education across the world, a myth has been formed that some African national parks have been created to protect the remaining bush that is still “teeming with wildebeest and elephants, lions and zebras” (Pearce, 2000), while elsewhere this “African Eden” (Adams & McShane, 1996, pp. 5–6) has largely disappeared because of human activity. Though this myth has been discredited by many Africanist scholars, conservationists and



Wildebeest, Serengeti National Park, Tanzania © Marc Hockings

ecologists (Brockington, 2002; Homewood, 2008), it is worth summarising why this discourse is only a part of the story. Many renowned African National Parks, including the Serengeti (Sinclair et al., 2015), Maasai Mara, Ngorongoro, Tarangire, Tsavo, Selous, Kafue, Ruaha, Okavango, Luangwa and Kruger, result from a history of disease that led to the disappearance of people, their livestock and other anthropogenic activities, including fire, from these landscapes in the late 1800s.

Rinderpest, a viral disease of ruminants, originated when the British imported cattle into Egypt from India in 1868 (Spinage, 2012, p.1057) and later Eritrea (Ford, 1971, p. 138; Rowe & Hødnebo, 1994, p. 155). Despite various unsuccessful colonial attempts to stop its dissemination, including quarantine and culling (Katzung Hokanson, 2019), the disease spread further (Marquardt, 2007). With a mortality rate of 90 per cent, cattle herds across the continent were devastated (Reader, 1998). It also impacted ruminant wildlife including Eland, Bongo, Wildebeest, Buffalo, Warthogs and Giraffes (Sinclair & Arcese, 1995, p.488; Sinclair et al., 2015, p.17).

Whenever Rinderpest struck, pastoral and other farming livelihoods reliant on draught animals (e.g. for waterwheels, plough and transport) stopped. Weakened human populations were more vulnerable to famine, to other diseases such as smallpox, typhus, cholera and

trypanosomiasis, and to natural disasters like locust plagues (Ford, 1971, p.141; Kjekshus, 1996, pp.126–132). Human populations were devastated and their subsistence activities, like cultivation, burning, hunting and raising cattle, were abandoned (Ford, 1971, p.196; Sinclair et al., 2015, p.16).

Once grazing pressure of livestock and other herbivores was removed, trees became established (Sinclair et al., 2015, Chapter 3). Thus landscapes once described by colonial and pre-colonial explorers and hunters as savanna grasslands (Onselen, 1972; Sinclair & Arcese, 1995, Chapters 4 and 23; Brockington, 2002, p.29) became dense thickets and woodlands. In turn, these thickets allowed the establishment of Tsetse fly (*Glossina*), carrying trypanosomiasis (*Trypanosoma*), a flagellated protozoic parasitic disease that kills cattle and causes fatal sleeping sickness in humans (Ford, 1971). This Tsetse fly-infested thicket discouraged the return of people and their livestock, but allowed populations of certain wild animal species to explode (Spinage, 2012, p.1092).

Till the mid-20th century, a vicious cycle of disease recurred in places such as the Serengeti, where Tsetse “flies multiplied, further lowering both human and cattle populations, leading to more habitat for Tsetse, and so on” (Adams & McShane, 1996, p. 49). Colonial administrators who had, since the 1890s, been creating game reserves in which colonial elites could hunt,

viewed these areas as pristine woodlands where many new reserves could be created. Later they became the protected areas of today (Pearce, 2000; Sinclair et al., 2015, Chapters 8 and 17).

In the 1940s and 1950s, colonial administrations started the first insecticide programmes against the Tsetse fly and cattle vaccination programmes against Rinderpest. As wildlife does not act as a long-term reservoir of Rinderpest, the vaccination of cattle brought about another explosion in wildlife populations (Sinclair & Norton-Griffiths, 1979, Chapter 4; Sinclair & Arcese, 1995, Chapters 4 and 23) and, at the same time, the return of pastoralists who felt it was safe to graze their livestock in these areas, setting up conflicts between pastoralists and conservationists (Brockington, 2002; Homewood et al., 2009; Sinclair et al., 2015, Chapters 4, 8, 16 and 17). These conflicts continue today, especially when this disease history is forgotten, helping to discredit historical land use and land claims (Bluwstein, 2019).

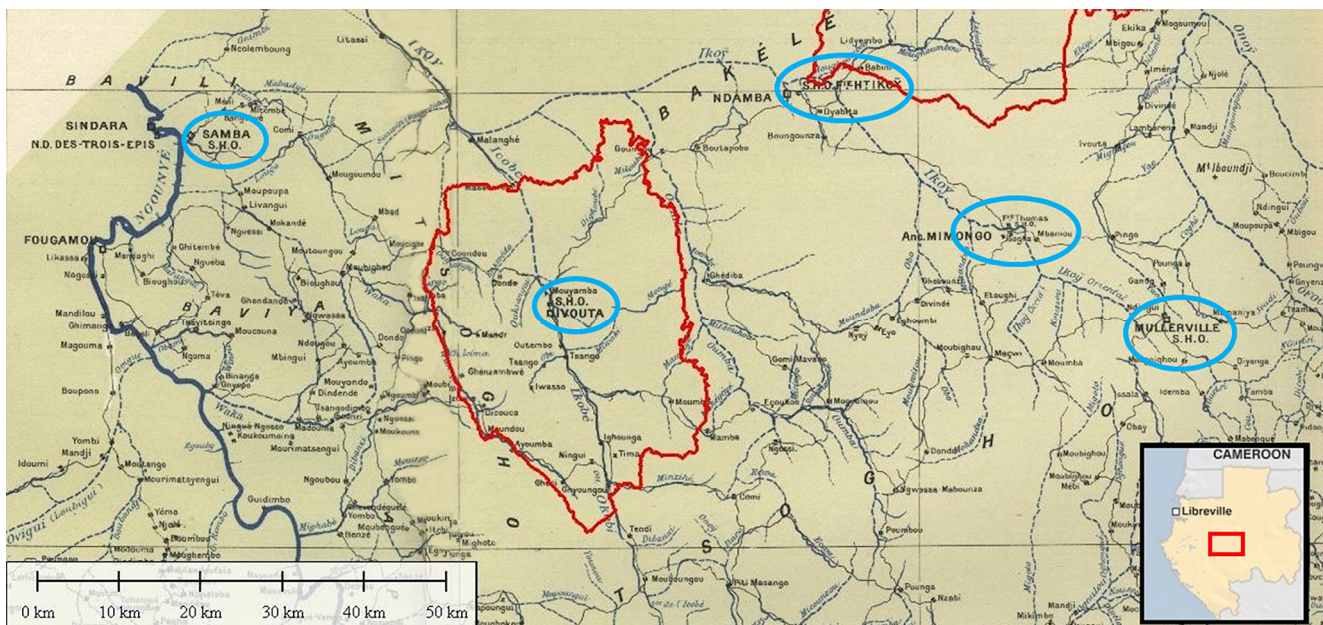
This brief history, which historians have written about in detail (Marquardt, 2007), shows how a late 1800s pandemic created the colonial mind-set of pristine wildernesses, which were then established as protected areas in eastern and southern Africa. Taking the Serengeti as an example, collaboration between ecologists, conservationists, historians and social scientists (see the volumes edited by Sinclair from: 1979

to 2015) has shown how this savanna landscape is at disequilibrium (Behnke et al., 1993). A landscape that is not based on a simple succession/climax theory upon which a carrying capacity for livestock can be determined, but rather a highly dynamic system that reflects the complexities of climate variability. This understanding has improved its conservation (Adams & McShane, 1996).

PAST EPIDEMICS, FAMINE AND COLONISATION: CREATING THE MYTH OF GABON'S EDEN

Waka National Park (107,000 ha.) is a mountainous park located in central Gabon, straddling the du Chaillu Massif (Map 1). It was created in 2002 in recognition of its rich culture, being the home of the Babongo Indigenous people (however see Hymas, 2015, Chapter 4 for how the Bantu speaking population fit into this rich culture), as well as endangered species such as Chimpanzees (*Pan troglodytes*), Gorillas (*Gorilla gorilla*) and Elephants (*Loxodonta cyclotis*). To its north lies the better-known Lopé National Park, which became a mixed UNESCO World Heritage site in 2007.

Within these parks, and in Gabon in general, disease-related human depopulation has a long history. The disappearance of iron workers between 1,400 and 800 BP from Lopé suggests that it was devoid of people for a 600-year period probably due to an epidemic (see Oslisly in Weber et al., 2001, pp.112–113; Spinage, 2012, p.1194). From the mid-1800s, the scramble for natural



Map 1. Gabon - Old trade routes, villages and Société Commerciale, Industrielle et Agricole du Haut-Ogooué (SHO) trading posts in 1928, with the addition of the current Waka and Lopé National Park boundaries (in red), old SHO trading posts (in blue). Adapted from Mariol (1928)

resources to trade with Europeans and the accompanying trade routes (see trade route map of Mariol, 1928), displacements, migration and forced labour intensified the spread of diseases (Sautter, 1966, p.625; Hartwig & Patterson, 1978, p.12; Hymas, 2015, Chapter 3). Resulting population density maps show empty areas (Sautter, 1966, p.969) as entire villages disappeared, which were then claimed by forest.

Multiple outbreaks of diseases and famine occurred in colonial Gabon from 1910 to the 1930s. During this period, colonial administrators described seeing bodies and skeletons along well-established trade routes (Sautter, 1966, pp.860–861; Coquery-Vidrovitch, 1985, pp.54–56; Gray, 2002, p.158). The best known of the outbreaks was the 1918 Influenza pandemic, when it is estimated that half the population died (Patterson, 1975, 1979; Debusman, 1993; Rich, 2007)⁵, even though “severe [maritime] quarantine measures [which] had prevented the entrance of the flu into Gabon” had been established (Headrick, 1994, p. 173; see also Patterson, 1981, p. 407). This depopulation was reflected by a French forester who wrote in 1918:

[d]ans toute la partie exploitable de la forêt du Gabon il devient de plus en plus rare de rencontrer des villages en plein forêt. La maladie du sommeil, l'alcoolisme, les maladies vénériennes ont fait disparaître une grande partie de la population et le reste, décimé, s'est rapproché petit à petit des points d'où il était facile d'aller aux factoreries européennes⁶ (Quillard in Chailley & Zolla, 1920, p.645).

The Ikobey area, which is a corridor between Lopé National Park and Waka National Park (Map 1) off the main trade routes, was not spared. From the late 1890s until the early 1900s, this area was part of a commercial concession belonging to Société Commerciale, Industrielle et Agricole du Haut-Ogooué (SHO) (Coquery-Vidrovitch, 2001, p.380). In 1907 one of the first colonial French commercial agents for the SHO, Monsieur Quéru, set up trading posts in the middle reaches of the Ikoy and Ikobey Rivers (Coquery-Vidrovitch, 2001, p.381). Via a network of caravan routes, he organised the buying and transport of rubber, ivory, raffia and palm kernels (Barnes, 1992, p.25; Coquery-Vidrovitch, 2001, pp.381–383; Gray, 2002, p.172). Later, new roads and caravan routes linked the trading posts at Sindara to the SHO trading posts and villages (Gray, 2002, pp.172–177). By 1928, the whole of the Ikobey area was criss-crossed with trading routes.

The trade activity of Europeans in the Ikobey region brought people in remote areas into contact with novel coastal diseases (Hartwig & Patterson, 1978, pp.9–10;

Headrick, 1994, p.42). The road building, carried out through a *regroupement* policy that relocated villages next to roads to provide forced labour, exacerbated the spread of various diseases, as did bringing porters and workers from greater distances. People fled the area as famine and disease spread. During the 1918 Influenza pandemic there was a 16.6 per cent mortality rate in the principal trading post of Sindara (Bruel, 1935, p.338).

By the 1930s, when the SHO lost the concession and was split up, the Ikobey area was completely depopulated, becoming a “dead zone” (Gray, 2002, p.160; Hymas, 2015, Chapter 4) which people feared was cursed (Choubert, 1954, p.37; Gray, 2002). For around thirty years, it was devoid of human presence, resulting in the growth of Okoumé (*Aucoumea klaineana*) trees and an increase in wild animal populations that had previously been hunted either for food or trade (Hymas, 2015, p.139). The network of trails and SHO trading posts fell into a state of disrepair and then disappeared altogether (Hymas, 2015).

With Gabon's independence from France in 1960, people started to return to the outskirts of the “dead zone”. A timber company was granted a 100,000 ha concession (Gomez-Jordana, 1971), which attracted people fleeing *regroupement* and others seeking employment in the Société l'Okoumé de la N'gounié (La SONG). Only with the arrival of this company did the “dead zone” close completely. Local communities, still present in the area, found forest everywhere, some recalling that: “ici c'est la forêt tout ça c'était la forêt, Nyoe I et Nyoe II c'est la SONG qui a ouvert ça” and “il n'y avait pas des vieux villages”⁷ (Hymas, 2015, p.144).

This reforestation later made the area – presented at the time by the National Geographic Society as an African Eden (Quammen, 2003) – attractive both to timber companies (interested in larger timber trees) and conservationists, who created national parks for their biodiversity. The historical literature and oral histories presented here show that this so-called Eden was the product of earlier disease outbreaks linked to colonisation, when diseases spread from populated areas into rural areas.

The cycle of disease/depopulation/forest regeneration described for Ikobey is not the first nor the last of its kind. Before the arrival of the Europeans at the start of the 20th century, the area had already gone through at least one similar cycle in the 1840–1880s, due to war (Hymas, 2015, pp.124–125). From 2000, another cycle has started with people migrating out of the forest to

roadside and urban areas (Hymas, 2015, pp.139–143). Once again, depopulation of the landscape around Ikobey is underway (Photo 1).

COLONISATION, EPIDEMICS AND THE PRISTINE MYTH IN BRAZILIAN AMAZONIA

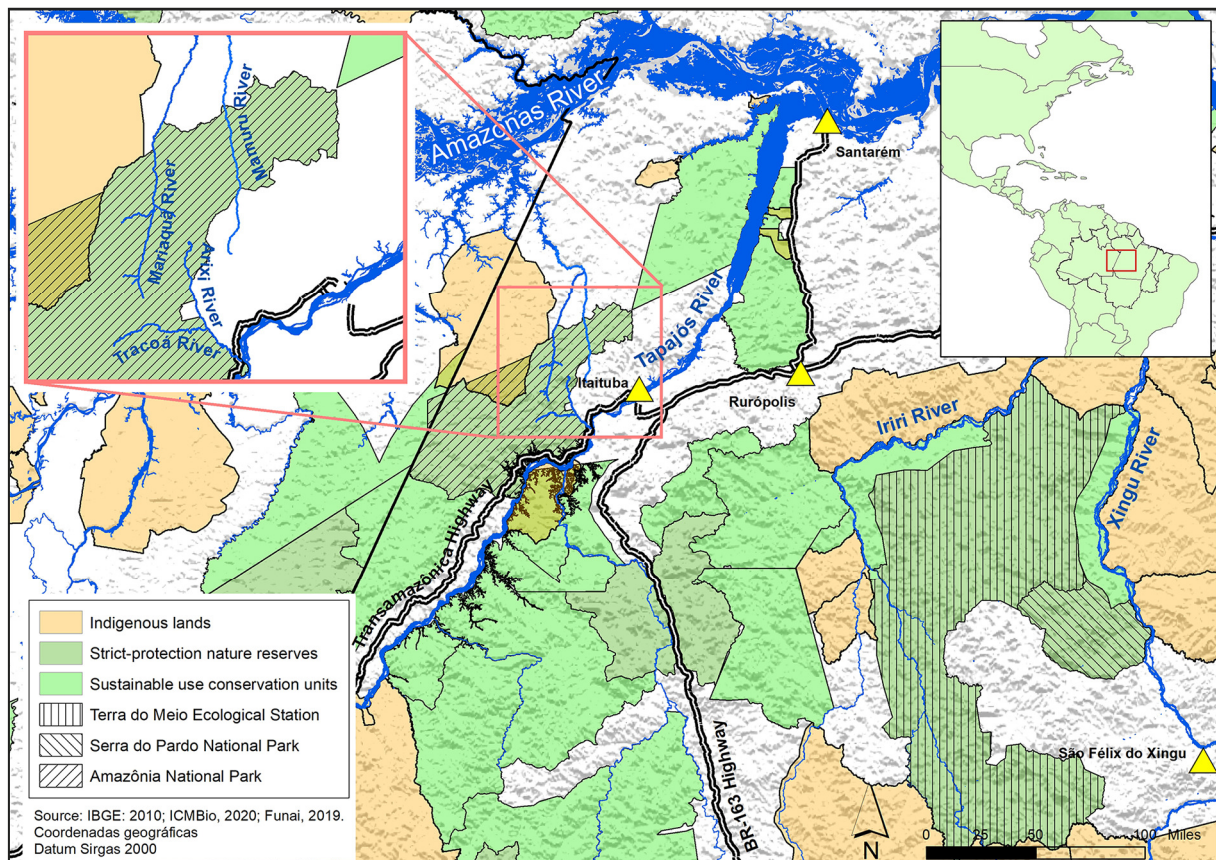
In contrast to the above examples, where epidemics led to the full (if temporary) abandonment of areas, in the Brazilian Amazon different lines of evidence show that forests have been continuously occupied and managed for millennia by Indigenous peoples and, from the eighteenth century, traditional communities – such as formerly enslaved Afro-Brazilians who fled captivity in plantations, and rubber tappers who came from the country’s northeast from the late 1800s (Photo 2). In this section we explore how the demographic collapses that occurred, largely as a result of epidemics that ensued from the European invasion of the Americas, fed into the creation of the Pristine myth (Denevan, 1992) – the idea that the region was uninhabited until European arrival. This in turn was fundamental in shaping policies for the region, including the creation of strict-protection conservation units⁸. We focus here upon the establishment of the Amazônia National Park (Map 2),



Photo 1. Forest taking over village site and logging camp that were abandoned around 2004, Gabon © Olivier Hymas



Photo 2. Trees that had previously been used for tapping rubber, Brazil © Natalia Guerrero



Map 2. Brazil - Amazônia National Park, by the Tapajós River

which is located near the last rapids of the Tapajós River as it travels northwards.

In Amazonia, evidence of cumulative human transformations of the environment is available from the earliest archaeological sites, dated around 12,000 BP (Shock & Moraes, 2019), involving plant use and management by Amerindian peoples. Formed from c. 4,000 BP, Amazonian Dark Earths (ADEs), or anthrosols, are the unintentional consequence of human habitation and/or the intentional result of past soil management (see Neves et al. in Lehmann et al., 2004, p. 35). They contain high levels of nutrients, organic matter and ceramic, lithic, faunal and botanical remains (see Kern et al. pp. 51-75 and Neves et al. pp. 29-50 both in Lehmann et al., 2004), and are extremely fertile. Studies have brought to light a “positive feedback process ... the long-lasting increase in productive capacity of soils for agricultural activities as a result of ancient habitation practices” (see Arroyo-Kalin in Pereira & Guapindaia, 2010, p.378).

Fossil lake and terrestrial records taken near the right bank of the lower Tapajós River, dating from up to 8,500 years ago (Maezumi et al., 2018), clearly show the impact of these environmental management practices. In pre-Columbian times, lake cores indicate a closed canopy forest where growing signs of anthropogenic activity occur from 4,500 BP, including an increase in palm, edible plants and controlled fires, without there being any large-scale deforestation. Further upstream on the Tapajós River, in the vicinity of the Amazônia National Park in Itaituba, indirect evidence points to millennial human occupation of the region (Simões, 1976; Rocha, 2017), while archaeological research, focused primarily on sites containing Amazonian Dark Earths, obtained dates for past occupations ranging from 680±30 CE to the 1800s (Perota, 1979; Rocha, 2017, pp.166–167). Within the park itself an archaeological survey located several former Amerindian sites (Oliveira et al., 2010).

The first European expeditions to the Amazon brought diseases that decimated Amerindian populations who had no prior exposure to them, either in practical or genetic terms (Myers, 1988). In close succession or simultaneously, smallpox, measles, influenza, tuberculosis and – in the wake of the Transatlantic Slave Trade – malaria, dengue, haemorrhagic and yellow fever devastated Amerindian societies. It is estimated that approximately 90 per cent of the Indigenous population in the Americas died in the first century following European invasion (Koch et al., 2019). The marked discrepancy between the descriptions by the first Europeans to travel along the

banks of the Amazon River (1540-1570), who mention densely occupied areas (Carvajal, 1934), and later descriptions of Indigenous societies by colonial missionaries (Myers, 1988) indicates the intensity of this early demographic collapse in these areas.

But contact was “a temporally extended process, rather than a single instant or event that ruptures the otherwise pristine Garden of Eden into which colonial Europeans at first believed they had stumbled” (Whitehead, 1993, p.288) and could in fact happen prior to the physical encounter between Europeans and Amerindian peoples (Posey, 1987). Reports of Indigenous people fleeing missions (e.g. Biblioteca Pública de Évora, no date) indicate another way disease may have been transmitted to areas beyond Portuguese presence as “disease agents and vectors could spread from intrusive (white) carriers to aboriginal populations” (Cook, 1955, p.411). Thus in interior areas, such as Itaituba, peoples living beyond the reach of early colonial settlements could have become infected before the physical arrival of Europeans (Rocha, 2017).

The town of Santarém, a former pre-Columbian centre situated at the mouth of the Tapajós River, became a stop-off point for European vessels ascending and descending the Amazon River. The definitive establishment of EuroBrazilian presence here happened early on: Jesuits founded the headquarters for their activities in southern Amazonia from 1661. Mission settlements practised little quarantining of the sick (Crosby, 1976, p.296) and became “critical in creating stable pools for reinfection” (Whitehead, 1993, p.290) of Old World diseases, which would travel outwards along the trade networks that spanned from Santarém (Rocha, 2017).

The deadly effects of these “virgin soil epidemics” (Crosby, 1976) were compounded by warfare, slavery and *descimentos*, whereby missionaries uprooted Amerindian villages from different social groups and resettled them together in mission stations (*aldeamentos*). Large percentages⁹ of people aged fifteen to forty died (Crosby, 1976, p.294), which led to famine, and the collapse of traditional environmental management practices and polyculture agroforestry systems (Brierley, 1999; Koch et al., 2019). With the collapse in population after 1500, the core samples of the lower Tapajós River show a drop in fire use (see Figure 2d in Maezumi et al., 2018, p.18). However, areas were not completely abandoned as the territorial dynamics of Amerindian societies also changed, and new populations, such as rubber tapper communities, were brought to the Amazon by the early 1900s.

The definitive establishment of EuroBrazilian presence further upstream in Itaituba, from the mid-1800s, would have started off new epidemic events. In contrast to frequent mentions of the effects of Old World diseases among Indigenous peoples living in Santarém and environs by Jesuits (e.g. Bettendorff, 1910), nineteenth-century travellers to the upper reaches of the Tapajós did not explicitly comment on the effects of diseases among the Indigenous population of that area.¹⁰ The Mundurucu Indigenous people did not forget, however: “There were no illnesses here before the *pariwat* [whites; enemies] arrived” (Mundurucu man in Melo & Villanueva, 2008, p.40). Referring to the “plague”, or “fever”, the Sateré-Maué people today allude to an epidemic that some of them lived through as children, which was likely to have been yellow fever or malaria, and that occurred around 1940-50 in the vicinity of the Mariaquã and Mamuru Rivers.¹¹ It is possible that this was an important element leading to an abandonment of these river valleys by the Sateré-Maué, though the rubber tapper communities remained. The Mamuru and the Mariaquã’s headwaters are now part of the Amazônia National Park, as are some of the lands of the Mundurucu.

In the 1950s, the Brazilian government determined that the “vocation” of the Amazon region was as a repository of natural resources that needed to be “integrated” into the rest of the country (Bueno, 2002; Arbex Jr., 2005, pp.21–67). From 1964, the military dictatorship continued these policies by promising “a land without people to people without land” (the people referred to being peasants pressuring for land reform in other parts of the country). The integration project led to the opening of roads, with massive incentives given to industrial agriculture and cattle-rearing enterprises in the region. The result was great devastation and a new genocide of Indigenous peoples (Brasil. Comissão da Verdade, 2014). At the same time, though, there was heightened conservation action, with the creation of 20 strict-protection reserves, covering almost 10 million hectares. Barretto Filho (2001, pp.158–159) argues that there is no contradiction here, as the creation of these numerous conservation units was made possible because they too reflected a top-down and hegemonically economic perspective.

The Amazônia National Park is a case in point. Created in 1974, based on the Yellowstone model (Torres, 2005), this is the area for which we observed ample evidence of previous human occupation – firstly by Indigenous peoples and later, straddling the nineteenth and twentieth centuries, by rubber-tapper communities. Yet the park’s Management Plan claimed that it was

“the country’s largest national park, with over a million hectares of rainforest, which is almost entirely unaltered” (IBDF & Polamazônia, 1978, p.83). In another passage, the plan states that a visit to “its unexplored dense rainforest, and the Tapajós River’s primitive beauty, could satisfy the desire [of tourists], through the contact with the Amazon’s primeval environment” (IBDF & Polamazônia, 1978, p.33). The plan clearly ignored the existence of places along the Tracua River, which were completely within the park’s limits, and where, according to people who once lived in the area, there was pasture for cattle. Interviews with people whose land was expropriated always told of the same experiences: subjection to intimidation, and violence to force them to leave their territories. Entire communities left. Ironically, a decade later, an area within the Amazônia National Park was removed from it to make way for mining.

As elsewhere in the Amazon basin, archaeological and palaeoecological evidence points to protracted human occupation of the Tapajós River, while historic documents and indirect palaeoecological data indicate the collapse in Amerindian populations following the European invasion of Amazonia in the 1500s. But despite the depopulation caused by past epidemics, surviving Amerindian peoples continued to occupy forest areas, which in the case of the Amazônia National Park would also come to be inhabited by traditional communities. Naturalists’ portrayals of the forest and its peoples would bring about the creation of the Pristine myth of lands supposedly unaltered by anthropogenic activity. This fed into a narrative that helped legitimise territorial expropriation throughout the basin with the super-imposition of strict-protection conservation units over traditionally occupied territories, with repercussions today.

CONCLUSION

By looking at past pandemics, we show that the impact of COVID-19 on the environment is not novel. Events like it have occurred since hominids started to migrate out of forests. Interdisciplinary conservationists, working with historians, archaeologists, anthropologists and others, have long studied the impacts of such events and the anthropauses they have brought about. Through three case studies, we have shown how past pandemics have set in motion a chain of events (Figure 1) that led to the creation of protected areas in landscapes that were, at the time, considered to be pristine wilderness.

We argue that it is misleading to use industrial society’s values and perspectives on history as an adequate basis for shaping effective conservation policies in places

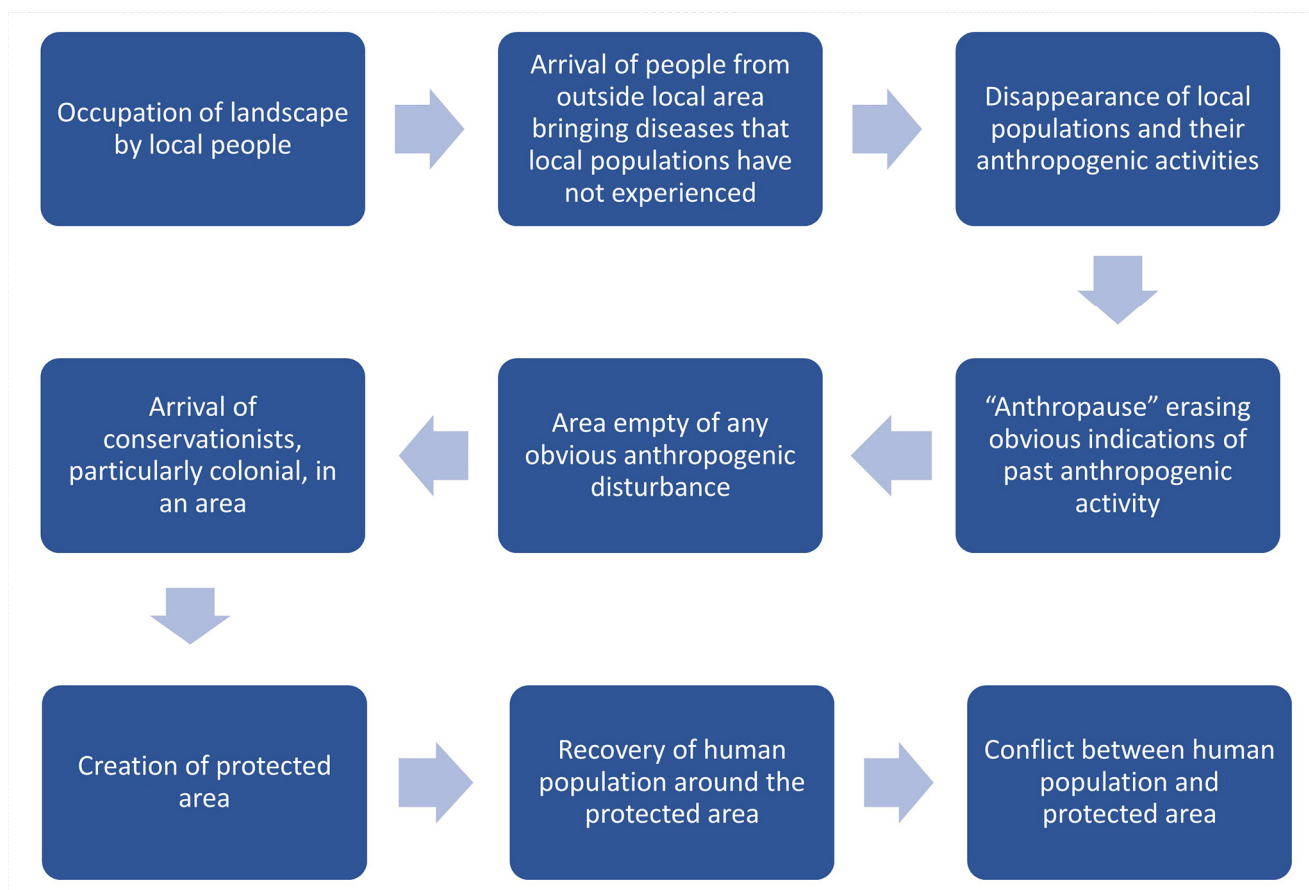


Figure 1. Chain of events following pandemics in the colonial era and how it impacts the perception by colonial conservationists of landscapes and ecology of protected and conserved areas

where these values and perspectives do not prevail and that it is mistaken to remove humans from conceptualisations of the environment (Pretty, 2011). Interdisciplinary scholars have repeatedly shown (e.g. Fairhead & Leach, 1996; Walters et al., 2019) that apparently pristine wildernesses hide a much more complicated history of large-scale depopulation caused by outbreaks of diseases that were spread by European colonisation, exploration and trade.

We have seen how disturbances in the human/disease relationship are, within a longer historical timeframe, relatively common. The depopulation caused by such disturbance events is often followed by a regeneration of vegetation – particularly in tropical environments – that conceals evidence of past anthropogenic activities. For the casual observer, without archaeological, historical or anthropological knowledge that would allow them to identify indicators of past human occupation, the vegetation succession creates the impression of a pristine wilderness. This *tabula rasa* (Aristotle, 2016, pp.60–61, gloss 430a; Duschinsky, 2012) has been used, particularly during the colonial period, to justify the creation of protected areas to the

detriment of the ecology, conservation and the peoples who have long lived in these landscapes.

Archaeological, historical and anthropological literature can help conservationists better understand the factors shaping many of the landscapes and ecologies of protected and conserved areas (Szabó, 2010; Pooley, 2013). It is increasingly being shown that current Indigenous peoples' and traditional communities' management practices in anthropogenic landscapes support the aims of conservation (Levis et al., 2017, 2018; e.g. Balée et al., 2020). It would be useful to carry out such studies for all protected and conserved areas in the world, including future ones, in order to better understand the role of local populations, disease and historical events in shaping such landscapes and by doing so improve protected and conservation area management, in particular recognising the role that Indigenous peoples and local communities have played in shaping today's conservation landscapes. Though interdisciplinary research is becoming common, carrying it out is easier said than done (various difficulties are described in Adams, 2007; Drury et al., 2011; Fox et al., 2006; Pooley et al., 2014). Too often, it

consists of little more than each discipline working separately on various aspects of the same project (Lowe et al., 2009).¹² Also it is susceptible to ‘garbage in/garbage out’ errors (GIGO) (Babbage, 1864, p.67; Hinde, 2004; Little et al., 2017). The interdisciplinary researcher must learn to be wary of their social, cultural and educational baggage, and accept that they may have to unlearn some fundamental assumptions in their own discipline. In effect, the interdisciplinary researcher “must also look inward to ensure that their own special interests do not undermine the usefulness of science” (Ascher, 2004, p.437).

While much progress has been made in both conservation and ecological science in accepting that pristine wilderness is very often a myth, current talk of the anthropause and use of ecological methods to substitute archaeological, historical and anthropological methods, suggests otherwise. We need to go further in our mindset change and assume that the great majority of protected and conserved areas have had some past anthropogenic activity until demonstrated otherwise. The first step in this process would be to accept that the anthropause is not new and redefine it to include any past event that has led to reduced anthropogenic activity (Figure 1). Only when ecologists and conservationists systematically integrate archaeological, historical and anthropological methods into their research and management of protected and conserved areas can it be said that we have finally de-bunked the myth of the pristine wilderness.

ENDNOTES

¹As of the 4 December 2020 it has been cited over 5,308 times.

²For an example of this progress, see the four volumes on the Serengeti edited by Sinclair from 1979 to 2015.

³For example, Jones et al. only analysed ‘EID events’ since 1940 and included yellow fever (Jones et al., 2008, p.993) and does not refer to any of the cases in the comprehensive 1979 bibliography of infectious diseases of Africa in the twentieth-century by Patterson (1979).

⁴Factors such as confined ecologists recording wildlife out of their windows at home. For instance Silva-Rodríguez uses idle camera traps to record the presence of Otters (*Lontra provocax*) in the urban areas of the city of Valdivia, in Chile, where they have “not been documented in the scientific literature, [though] its presence near the civic center of the city has been anecdotally reported before” (Silva-Rodríguez et al., 2020, p.8).

⁵The early twentieth century particularly impacted the Fang people, just like the mid-nineteenth century had impacted the Mpongwe. The Fang had continued to migrate to new trading centres on the coast to participate in trade, and with this the mortality rate of the Fang increased (Sautter, 1966, pp.860–872). Missionaries estimated that during the influenza pandemic of 1918, 10 per cent of the population of Kango (east of Libreville) died (Rich, 2007, p.249), while by 1930 the Fang

population had reduced by a half (Coquery-Vidrovitch, 1985, pp.54–56).

⁶“in all the exploitable areas of the Gabonese forest, it is becoming more and more rare to find villages in the middle of the forest. Sleeping sickness, alcoholism, venereal diseases have resulted in the disappearance of a large part of the population and the rest, decimated, have slowly come closer to places where they can get easy access to European factories”.

⁷“here everything was forest, all that was forest, Nyoe I and Nyoe II, it was La SONG that opened it up”. Makoko, Babongo Ghebondgi 24/02/10 [recording DS400043; 17:15] (Hymas, 2015, p.144). “there were no old villages”. Nyoe II, Akele 22/05/10 [recording DS400078; 16:25] (Hymas, 2015, p.144).

⁸In Brazil, strict-protection conservation units, which include National Parks, Ecological Stations and Biological Reserves, are one modality of protected area that does not permit human occupation. Sustainable use conservation units, on the other hand, are another modality that allows for human occupation, though in accordance with stipulated norms.

⁹It is hard to be more specific than this as it varies from people to people, over time and geographical location.

¹⁰Administrative documents and naturalists’ accounts dating from the turn of the nineteenth to twentieth century testified to the continued occupation by Indigenous peoples and traditional communities of the area. Land titles issued by the Itaituba Intendencia between 1892 and 1904 recognised lands belonging to the Sateré-Maué people who lived inland, while the presence of Munduruku Indigenous peoples close to the banks of the Tapajós is noted.

¹¹This living memory heavily influenced Sateré-Maués’ reaction to news of the arrival of SARS-CoV-2, leading them to autonomously isolate themselves when they heard of the pandemic’s approach.

¹²One of the pitfalls of interdisciplinarity is replacing long-established method protocols of one discipline with protocols designed for another discipline, a form of ‘Special Interest Error’ (Little et al., 2017, p.280).

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RESUMEN

En muchas sociedades industrializadas, la pandemia del COVID-19 ha sido descrita como un momento sin precedentes causado por el abuso humano de la naturaleza. Sin embargo, las reacciones a la pandemia también han frenado temporalmente los impactos humanos sobre la naturaleza. Esto ha dado lugar a una lucha contra la ocupación humana en las llamadas áreas vírgenes intactas. Al reflexionar sobre las pruebas históricas, arqueológicas y paleoecológicas relativas a los impactos de las epidemias pasadas dentro de un marco histórico más amplio de África y América del Sur, mostramos que, aunque el COVID-19 es una enfermedad nueva, la pandemia en sí misma no constituye un acontecimiento nuevo, habida cuenta de que las enfermedades traídas por los europeos ya habían diezimado a los pueblos que habitaban en estas áreas. La "naturaleza prístina" es un mito, que afirmaba con falsedad que estos lugares siempre habían estado deshabitados, ayudando así a legitimar la creación de áreas protegidas, y su control político por parte de las administraciones tanto coloniales como nacionales. De ahí que cuestionamos lo que se ha venido denominando la "antropausa" –que la supuesta reducción de las actividades antropogénicas provocada por la actual pandemia constituye una nueva oportunidad para estudiar los impactos antropogénicos en la naturaleza: existen numerosas ocasiones anteriores en las que la despoblación dio lugar a antropausas. Tales respuestas al COVID-19 sugieren que, a pesar de los avances en esta dirección, se necesita una mayor interdisciplinariedad en el campo de la conservación.

RÉSUMÉ

Dans de nombreuses sociétés industrielles, la pandémie COVID-19 a été dépeinte comme un moment sans précédent causé par l'abus humain de la nature. Les réactions à la crise ont, à leur tour, ralenti temporairement les impacts humains sur la nature. Cela a conduit à un cri de ralliement contre l'empiétement humain sur ce que l'on prétend être des étendues sauvages vierges. En se basant sur l'évidence historique, archéologique et paléoécologique relative aux impacts d'épidémies passées sur une période historique plus longue en Afrique et en Amérique du Sud, nous montrons que si la COVID-19 est une maladie nouvelle, la pandémie elle-même ne représente pas un événement nouveau, puisque les maladies apportées par les Européens ont déjà décimé les populations vivant dans ces régions. La «nature sauvage vierge» est un mythe, qui prétend à tort que ces lieux ont toujours été vides de personnes, contribuant ainsi à légitimer la création d'aires protégées et leur contrôle politique par les administrations coloniales et nationales. Nous remettons donc en question l'hypothèse que l'on appelle «l'anthropause» - selon laquelle la réduction supposée des activités anthropiques causée par la pandémie actuelle présente une nouvelle opportunité d'étudier les impacts anthropiques sur la nature. En effet de nombreuses occasions antérieures existent où le dépeuplement a entraîné des anthropauses. De telles réponses à la COVID-19 suggèrent qu'une plus grande interdisciplinarité est nécessaire dans le domaine de la conservation, malgré les progrès déjà réalisés dans cette direction.