Molecules of Freedom: Climate Change Denial as a Form of Political Subjectivation

Preprint · October 2021

DOI: 10.13140/RG.2.2.28871.83360

1 author:

Davide Scarso

Centro Interuniversitário de História das Ciências e da Tecnologia

38 PUBLICATIONS **15** CITATIONS

SEE PROFILE

Molecules of Freedom

Climate Change Denial as a Form of Political Subjectivation[1]

Davide Scarso

CIUHCT
Centro Interuniversitário de História das Ciências e da Tecnologia
Faculdade de Ciências e Tecnologia
Universidade Nova de Lisboa

Introduction

In a society meant to be driven by reason and knowledge, and often described as 'modern', the dissemination of unreasonable beliefs is met with surprise and unease. Discourses that question the reality of facts usually taken to be true trigger reactions of disbelief, refusal and more or less generous attempts to debunk them. Discourses of denial reject views usually considered to be valid. In most cases, the validity of the disputed view or fact is established in a more or less indirect way and through a consensus reached among a group of people considered particularly able to pronounce themselves on the truth or untruth of the facts in question.[2] It is unlikely, for instance, that someone should deny the fact that, under certain conditions, water transitions from liquid to solid to gas, since this is an experience easily accessible to all. However, when it comes to the age or shape of our planet, we have to rely on more structured and indirect forms of knowledge. When interviewed for the podcast *Generation Anthropocene* (Osborne, 2012), US biologist Paul Ehrlich, better

---

[1] Parts of this work were presented via video conference at the "Colóquio Internacional Política e Pandemias" (International Conference Politics and Pandemics), organised by the Centro de Investigação em Ciência Política of Universidade de Évora (Centre for Research in Political Science at the University of Évora), in November 2020, and at the doctoral seminar organised by CIUHCT (FCT-UNL, http://ciuhct.org) in February 2021. I thank the organisers and participants of both initiatives for the valuable opportunity to engage in discussion and look more deeply into some of the matters discussed here. A previous version appeared in Portuguese as "As Moléculas da Liberdade: Negacionismo Climático como Resistência Paradoxal", in Nuno Pereira Castanheira, Jair Tauchen, Davide Scarso and Agemir Bavaresco (eds.), *Questões Ecológicas em Perspectiva Interdisciplinar: Natureza e Sociedade no Antropoceno – Superando a Separação?* (Porto Alegre: Fénix, 2021), 25-54. My sincere gratitude also goes to Moira Difelice for the English translation and editing of the text.

[2] By denying facts deemed true by the majority, denial can have stronger or weaker associations with conspiratorial types of reasoning. If some believe that certain facts usually presented as real need to be denied, it is due to forces and powers that aim to hide the 'real' truth. In this sense, conspiracy theories are a kind of 'complementary reverse' of denial. The connection between denial and conspiracy theories is extremely interesting and will be addressed later on, though it is not the focus of this text.

known as the author of the controversial *The Population Bomb* (1968),[3] attributed the lack of stronger and more global initiatives against climate change to the fact that CO2 is transparent and, therefore, invisible. If CO2 were red and the sky would take on a redder hue day after day, we would all be more willing to change our habits. In other words, since we do not have immediate access to the changes in the atmosphere – and, therefore, need to rely on sophisticated instruments and calculations, and the relatively few experts who can read them – doubt and distrust are more likely to settle in.

Although it is possible to outline formal aspects that are common to denial in general, it goes without saying that the origin and functional characteristics of its variants depend largely on the nature of what is denied. A first broad distinction might differentiate between discourses that deny the reality of certain historical facts (most infamously, denial of the Holocaust) and discourses that deny the reality of certain scientific facts, such as climate change denial (or 'scepticism' when the tone is slightly less dogmatic). In the latter case, going against what many experts affirm, the existence of climate change on a global scale is questioned, whether by denying that any change has taken place or by attributing possible changes to the natural cycles of the Earth's climate system, therefore denying their connection to any type of human activity.[4]

Procedures leading up to the establishment of a fact, its reality or truth, differ widely depending on whether they are historical events or natural processes. And even within the latter, the epistemological differences across scientific practices are substantial.[5] There is constant talk about the need to follow the advice of 'Science', but the meaning and role of evidence, verification and experimentation in the field of virology, for example, are quite different from their meaning and role in climate sciences. For the analysis presented here, what stands out is that the most important examples of scientific denial are closely connected to forms of opposition to science-driven policies, which does not happen with the denial of historical facts, usually more directly linked to extreme ideologies (neo-Nazism, chauvinistic nationalism, white supremacy, etc.).

---

[3] *The Population Bomb* was co-authored by Anne Ehrlich, Paul's wife, who, however, was left uncredited (see Ehrlich and Ehrlich, 2009).

[4] There is extensive literature on both cases. Regarding denial of the Holocaust, see Castro (2014) and, considering his presence on the Web and social media, Carvalho (2016). As for climate change denial, it is worth recalling it emerged in the 1990s, having probably been examined for the first time in the article *The heat is on* by Ross Gelbspan (1995) and in the book with the same title that followed (Gelbspan, 1998). Painter and Ashe (2012) present an interesting comparative study on the presence of climate scepticism in the print media of six countries between 2007 and 2010.

[5] On the existence of different 'styles of reasoning' in the sciences, see Hacking (2009).

In other words, while denial of concentration camps for 'enemies of the Aryan race' clearly reflects an adherence to a more or less structured ideology, denial related to HIV/AIDS, which will be addressed below, seems to dispense with any predetermined political stance and, therefore, result from sheer ignorance and manipulation. The key idea this paper explores is that if climate change denial is relatively widespread, in spite of the continued efforts of researchers and journalists to debunk it, it is not only because of the ignorance of the average citizen and the powerful propaganda of the fossil fuel industry, but also – and perhaps mainly – because it is assumed as a form of resistance in defence of freedom and individual autonomy.[6] A mistaken and paradoxical form of resistance, without doubt, which is precisely why it calls for careful examination.

Climate change denial and the misinformation apparatus

Scientific meta-analyses on climate change carried out during the last two decades indicate there is broad consensus among experts regarding the fact that the processes regulating the planet's climate are changing as a result of certain human activities. Estimates for the consensus vary between 91% (Verheggen *et al*., 2014), 97% (Cook *et al*., 2013), all the way up to 100% (Powell, 2017). Considering the near-unanimous view of scientists, the dissemination of discourses of denial, both in informal conversations and in statements made by public figures, continues to create perplexity. The classic and perhaps most frequent interpretation, which more or less tacitly underlies the effort of the more 'rigorous' press to debunk these claims, is that sceptical subjects earn credit and spread easily because most people do not understand science. According to this view, if citizens were better informed, there would be not only greater trust in what most climate scientists are saying but also – presumably – greater mobilisation and more resolute action.[7]

---

[6]As this text is being written in the middle of the pandemic, it is impossible not to draw parallels with COVID-19 related forms of denial. There is no space to expand on that reading here, but clearly a number of distinctions would have to be made, starting with the role and attitude of government bodies, which are completely different from what happens with climate change denial.

[7] Marine biologist and film-maker Randy Olson (2011) used the expression "nerd loop" – a circular conversation between initiated individuals – to denounce the self-referential and unproductive character of most science communication initiatives on climate change. In other words, the unreliability of sceptical theories is only relevant to those already willing to look into the reliability of a given argument, the solidity of its empirical grounds and the rigour of its assessment by a community of peers, which brought Olson to urge science communicators to find more creative ways of carrying 'the message'.

The tendency to 'point a finger' at an information deficit or a problem in communication – seen as critical to the relationship between science and technology professionals, on the one hand, and society, on the other (the deficit model, precisely) – precedes the climate crisis and, although it has not lost its power of attraction, it has been vigorously challenged for quite some time (Bucchi, 2009). For example, the correlation between an individual's level of scientific literacy and their attitudes towards climate change is known to be quite low, as a meta-analysis of nearly two hundred studies carried out in 56 different countries shows (Hornsey *et al*., 2016). When it comes to ideological and religious views, usually called 'values', the correlation increases. Therefore, more than a question of communication or understanding, these arguments seem to have strong social and political ramifications (Bucchi, 2009).

Bearing this in mind, climate scepticism is known to be less pronounced in Europe than in other countries. The percentage of people who believe "the climate is not changing" or that "it is changing but not due to human activities" ranges between 7 and 10% in Western Europe (the lowest percentage being 5% in Greece), rising to 17% in the USA, 20% in Egypt and a striking 30% in Saudi Arabia (Yougov, 2019). It is hard not to think about the influence of the oil industry in spreading discourses of denial and, moving beyond the naivety of the deficit model, the work of Naomi Oreskes (Oreskes; Conway, 2010; Supran, Oreskes, 2017), among others, has clearly shown how apparent ignorance and lack of information are also the outcome of a highly sophisticated misinformation apparatus aimed at protecting the profits of large oil companies. This happens through direct or indirect funding of contrarian scientists, whose publications come into the public eye in a way that barely corresponds to their real standing within the scientific community, which is usually quite marginal (Petersen, Vincent and Westerling, 2019). A similar dynamic is the support awarded to public figures with some prestige in politics or the media as a way to create channels for the propaganda of denial. These are the "merchants of doubt", to employ an expression by Oreskes (2010), i.e. sophisticated agents of misinformation that jump into action every time the profits of large industrial complexes are threatened. Concentrated in the United States, the misinformation apparatus developed in the tobacco industry and was later applied to the case of asbestos, CFCs and, more recently, fossil fuels. Its main goal is not so much to prove that there is not a causal relationship between inhaling tobacco smoke and developing lung cancer, for example, or between the rise in CO2 emissions and climate change, but rather to suggest that this relationship has not been proven, not all experts agree and, therefore, there are good reasons to doubt.

It is worth citing an example that illustrates this type of manoeuvre perfectly: in an advertisement published in the *New York Times* in 1997, precisely when the US Congress was debating whether to ratify the Kyoto Protocol, Exxon advised not to rush to a decision: "Let's face it: The science of climate change is too uncertain to mandate a plan of action that could plunge economies into turmoil... Scientists cannot predict with certainty if temperatures will increase, by how much and where changes will occur" (*apud* Supran, Oreskes, 2017). However, one year earlier, an internal document of Mobil engineers concerning a joint project for the exploitation of natural gas near the Sable Island in the Canadian Atlantic, to be carried out with Shell and Imperial Oil (a Canadian subsidiary of Exxon), which was to start in 1999 and extend over the next 25 years, stated the following: "An estimated rise in water level, due to global warming, of 0.5 meters may be assumed" (Jennings, Grandoni and Rust, 2015). After analysing different types of documents produced by Exxon and Mobil Oil – which merged in 1999 to give rise to today's ExxonMobil – Geoffrey Supran and Naomi Oreskes (2017) observed that, following an initial commitment to advance scientific research on the connection between fossil fuel emissions and climate change, those companies radically changed their attitude. From 1990, although they continued to be involved in climate sciences, this was limited to academic publications mainly shared among experts, whereas with the general public they activated a powerful propaganda apparatus aimed at spreading doubt and scepticism. As stated in a 1988 internal memo, to avoid the harms that a drastic reduction in CO2 emissions would create for the industry, they had to "[...] emphasize the uncertainty in scientific conclusions regarding the potential enhanced Greenhouse effect" (*apud* Supran, Oreskes, 2017). By reinforcing insecurity and suggesting the lack of a clear consensus among experts, propaganda funded by major fossil fuel companies could weaken the support for policies aimed at reducing emissions and fostering the transition to energy-producing systems with a lower impact on the environment. Still with the aim of compensating for the limitations of the deficit model and the overall inefficiency of communication initiatives to combat climate scepticism, a number of very rigorous studies have highlighted the psychological, psychosocial or cognitive traits of deniers. With rare exceptions, however, those studies essentially claim to offer 'scientific' explanations to support new initiatives aimed at raising awareness and changing behaviours that are no more than a – this time 'benign' – form of manipulation that falls far short of any full acceptance of the social and political ramifications of the subject at hand.[8] The risk is to continue seeing the denier – and, ultimately, the

[8] See, for example, Stoll-Kleeman, O'riordan and Jaeger (2001), Gifford (2011), Hornsey *et al*. (2016), Haltinner

'average' citizen – as a mere object of external influences or as a prisoner of their own preconceptions or 'values', bringing passivity to a process that, on the contrary, takes shape first and foremost as a form of active engagement, as much as we may disagree with it.[9]

Examples of climate change denial

Two notable characteristics of climate change denial are its constancy over time and its modular nature. Whoever has had the chance to engage in more or less prolonged conversations with people prone to denial or to browse through the corresponding literature, will have noticed how it is made up of a series of repeatedly resumed basic arguments. Those arguments – most of which have been around for many years – can be more or less structured, ranging from "today is so cold global warming can only be a lie" to more elaborate reasoning such as "some glaciers are growing, which contradicts the idea that global temperature is rising"[10]. Supporting the examples of denial found in everyday conversations or social media, as well as some widely read publications, a number of texts claim to be rigorous pieces of scientific research and intend to offer evidence that challenges climate change. Those texts represent, so to speak, the 'hard core' of climate change denial and are invariably evoked when their supporters deem it necessary to offer more rigorous – i.e. 'scientific' – grounds for their views. Once given the opportunity to discuss the subject with climate sceptics, a certain functional equivalence between the various references may be noticed: as soon as the reliability of one is challenged, a new one comes out, on a totally different aspect, to replace the first. Someone, for example, might mention a scientific article claiming that the changes in global temperature depend on variations in volcanic activity, not the rise in CO2 emissions

---

and Sarathchandra (2018). In the book *Climate Change Denial* (Washington and Cook, 2011), the proposal to combat climate scepticism is no more no less than an invitation to "accept reality" – a reality that, according to quite a popular mantra, would have been challenged by the 'excesses' of postmodern critique.

[9] One of the exceptions, aiming to bring the subject into the political (and not just public) realm, is Rensburg and Head (2017). Also, the interpretation of climate change denial recently presented by Deborah Danowski (2018) cannot be overlooked. According to the Brazilian philosopher, this phenomenon can only be fully understood in its relationship with other forms of denial, particularly denial of the Holocaust and denial of the cruelty inflicted on animals raised and slaughtered for human consumption. What all these forms of denial would then have in common is to conceal a "[...] desire for the death and extermination" of alterity, a desire that is "[...] the driving force behind all fascisms" (Danowski, 2018, p. 6). This reading, which could be described as 'metaphysical', can certainly elicit a strong moral rejection of climate scepticism, but at the expense of a generalisation that seems to erase any historical specificity and ends up preventing politically productive developments.

[10] The quotes are not literal. In the first case, the statement went viral based on a tweet by former US president Donald Trump (Meyer, 2019); for one of the latest incarnations of the second type of reasoning, which has been circulating for at least a decade, see Frishberg (2020), and for its rebuttal, Buis (2019) and Kirk (2019b).

connected to certain human activities. Then imagine another participant in the conversation warns that the paper in question, by Arthur Viterito (2016), a retired geography professor, was published in a journal of which he is the editor-in-chief and that is supported by the Heartland Institute, an organisation notoriously known to be funded by ExxonMobil and with which Viterito was policy advisor until 2017.[11] It is very likely, as noticed on several occasions, that the first speaker drops the argument only to mention some other essay citing, for example, variations in solar activity or in the Earth's electromagnetic field. The impression these conversations give is that the arguments and their supporting documents are not used for their intrinsic value, but only with the aim of opening cracks in the rival discourse, i.e. as political weapons. And, to that end, pretty much anything goes.

Many researchers and activists are committed to debunking arguments that deny the reality of climate change. One of the liveliest initiatives is the education organisation *Skeptical Science*,[12] which claims, in a kind of double strike, to support a sceptical approach to climate scepticism. *Skeptical Science* intends to be a useful 'toolbox' for those who wish to rigorously refute contrarian statements or for those who, affected by the latter, wish to verify their actual grounds. Their website presents a list of the most recurring climate change myths, in decreasing order of frequency, briefly contextualising each and offering the corresponding counter-argument, with all the necessary reliable references.[13] Given the frequency by which statements appear and reappear, essentially repeating themselves in the most varied contexts, it is almost sure that any conversation involving a degree of climate scepticism will include one or more of those contrarian 'memes'. Therefore, the material gathered at the *Skeptical Science* website, which includes a neat *Debunking Handbook* (Lewandowsky *et al*., 2020), can be quite useful for anti-denial actions.

By talking to some contrarian friends, I realised that this type of view was being experienced as a form of political resistance – a visibly paradoxical one, perfectly aligned with the interests of the fossil fuel industry. In one of many, often uneasy, conversations, it became clear that one of these friends – a precariously employed teacher and former activist in anti-globalisation movements – was living the counter-science issuing from the propaganda apparatus of multinational oil companies as a weapon in the struggle for freedom and

---

[11] Besides taking up the same argument in several subsequent publications, Viterito also published an article with the title *Climate Change: Is the Science Settled?* (2017) (and, in case you are wondering, his answer is no). The website Desmog.com, which also tackles climate disinformation, describes Viterito's activities in detail: https://www.desmog.com/arthur-viterito/.

[12] https://skepticalscience.com.

[13] See https://skepticalscience.com/argument.php.

autonomy. With a vaguely Gramscian ring – which I believe was no accident – one day this person said "if you want to fight power, you have to start by fighting its narratives". The power in question was that of large organisations, both national and transnational (i.e. the European Union, the WTO, etc.), as well as companies (like Microsoft or Google) that, by funding scientific institutions, new 'green' industries and powerful propaganda apparatuses, intend to reshape our way of life. And, as if it were not enough, they want to do it 'for our own good'.

That corporations dedicated to the extraction, refining and distribution of fossil fuels – and the centres of power they are connected to – do everything they can to protect their profits, going against any attempt to reduce the use of hydrocarbons, is not exactly surprising. Just as the resistance of those who see climate change as the Trojan horse of market regulation by public authorities (in a word, what US Republicans regard as 'socialism') is not surprising either. The testimony of a repentant denier illustrates this clearly: "This is how the government was going to trick us into giving our rights away and fully regulate the economy to protect the environment" (Kirk, 2019a).[14] However, while the interests and ideological battles of fossil fuel capital and free-market apostles form the principal apex of climate change denial, their success cannot only be explained as the effect of sheer manipulation. Or rather, for manipulation to be effective, it must, to an extent, meet the sympathies of its targets. Otherwise, it is not possible to understand why individuals who get no real benefit from fossil fuels or economic deregulation – and, in many cases, are the most exposed to the negative effects of both – show so much willingness to appropriate and spread those types of arguments.

As researcher Teresa Ashe (2019) points out, an important aspect in adhering to theories of denial is the "fear of change". Faced with discourses that radically challenge the current social, economic and political balances, without offering any guarantee on the nature of what will follow, the first reaction, understandably, is one of unease and refusal. However, by not looking deeper into the nature of this reaction, we risk making this 'aversion to change' a psychological trait specific to a given group of people (Castel, 2003). At the same time, the idea that change is an inherent characteristic of modern society that equally affects

[14] In that sense, the contradiction between Google's public activity, clearly supporting the fight against climate change, and its present funding of influential organisations spreading denial is only apparent. The funded groups are, in fact, not only deniers, but above all ultra-liberal, i.e. fiercely opposed to any type of regulation and, as a source close to the digital giant explains, "[...] when it comes to regulation of technology, Google has to find friends wherever they can" (Kirchgaessner, 2019).

all its members may end up being reinforced, along with the idea that whoever opposes it is resisting the natural flow of 'progress' and 'modernisation'.

In that sense, the observations of Robert Castel (2003) regarding 'populist' movements provide a useful analogy. According to the sociologist, the rise in votes for right-wing parties, cast by social groups historically connected to the left, cannot only be explained in terms of the 'fascistisation' of the working classes. The electoral success of the far right, a serious and worrying phenomenon, is the outcome of an exploitation of fears and resentments from social groups threatened by profound changes in working conditions and levels of social protection. Castel draws a comparison with Poujadism, the movement led by Pierre Poujade in the 1950s, defending the interests of small traders and craftsmen threatened by the growth of large shopping areas, which they considered not to be adequately supervised by the elected members of parliament. This was a raw and profoundly ambiguous reaction from those groups of society who most saw their situation and views be shaken as a result of the radical reconfiguration of social and economic relations initiated during the second post-war period. In that sense, more recent populist phenomena reflect similar movements but with a significantly different class composition. With the progressive erosion of long-term employment contracts and their associated forms of social protection, in association with the increasing tertiarization of many Western economies, the advances brought by union struggles and collective bargaining are today being dismantled and many workers, both in blue and white collar sectors, find themselves caught in a situation of increasing precariousness.

As is known, the gradual dismantling of what Margaret Thatcher called the "collectivist society" in a famous interview she gave in 1981 – i.e. (among other things) the end of stable employment in the medium and long run – came to be presented in terms of flexibility and new opportunities. However, not everyone, once freed from the shackles of the welfare state and the 'excesses of democracy', was able to suddenly become a self-employed entrepreneur with the same ease. It is not hard to imagine, by analogy, that the pressure to transition towards greener and more sustainable forms of production could be seen by some social groups as a serious challenge to their present and future socioeconomic status. The impressive mobilisation of yellow vests in France, for instance, was born precisely against the imposition of a carbon tax, i.e. against the increase in taxes on CO2 emissions from fossil fuels decreed by the French government for 2019. A tax aimed at encouraging more 'ecological' attitudes was actually received as a potential trap by those who considered, quite rightly, to have no viable alternatives to car travel or gas heating (De Perthuis and Faure, 2018). This "revolt of the forgotten" clearly showed that any project for a widespread

conversion to renewable energy sources must take into account social and economic justice.[15] These forms of resistance, with all their ambiguities and differences, have the value of bringing the democratic governance of social and technological change back to the table.[16]

Beyond the fossil fuel industry and ultraliberal zealotry, climate scepticism can then be interpreted not so much as a refusal of change in general, almost as if it were a trait of certain individuals, but as a refusal of change seen as a potential threat to the social and economic situation of certain groups, who feel they have no room for negotiation. A bit like those who, in bolder demonstrations, dig up paving stones that others will then throw at their opponents, the apparatus sowing doubt about climate change offers weapons that others may consider useful to their aims. More than a manipulation that a sort of 'militant scientism' can undo by realigning society according to the guiding principles of reason and knowledge, contrarian arguments work because they offer – or seem to offer – a margin for action and resistance to those faced with events experienced as lying completely beyond their sphere of agency.

The approaches that, following a distinctly 'modern' understanding of human and social sciences, seek to deconstruct the 'fears' or 'cognitive dissonances' of deniers are not wrong because they are false or ineffective, but rather because they appeal to the passivity of the governed, completely depoliticising the urgent need for a decarbonisation of energy infrastructures.[17] The only suitable answer, on the contrary, would be to enable widening spheres of debate, participation and a full assumption of the political nature – i.e. inherently conflictual and not solvable on a merely technical and rational basis – of the climate issue.

---

[15] The term "revolt of the forgotten" spread at the end of 2018 and appears in the title of a number of the weekly *Le 1* (Inégalités: la révolte des oubliés, 2018). Concerning the yellow vests protests, about which a lot was written, see the statement issued by Jacques Rancière (2019) and the conversation between Nicolas Truong and Gérard Noiriel (2019).

[16] From this point of view, there are undoubtedly interesting similarities to be explored between climate scepticism and Luddism, in its various forms, and I thank my colleagues at CIUHCT Maria Paula Diogo and Jaume Valentines-Álvarez for having drawn my attention to this. This proximity is also mentioned in the final pages of the PhD thesis of Teresa Ashe (2012), now a book project that I hope will be published soon.

[17] To give an even clearer example of technocratic depoliticisation – in this case, from the 'left' – it is worth mentioning a statement by Gilberto Corbellini, professor of Bioethics and History of Medicine at Sapienza University (Rome) and former director of the Centro Nazionale delle Ricerche (National Research Centre). Commenting on the findings of a study about the effects of administering oxytocin, in an article published in *Wired*, Corbellini (2018a) concludes that, as long as accompanied by a social pressure favourable to altruism, "elevated levels of oxytocin could promote the acceptance and integration of migrants in Western cultures". Answering the criticism of those who refused the idea that injecting hormones into the population could be an acceptable option, Corbellini added "[*David*] Cameron thought about ending the riots in the outskirts of London by putting oxytocin into drinking water pipes" (Corbellini, 2018b). Unfortunately, I did not find any direct source to corroborate this last statement, but see Honigsbaum (2010).

Climate change denial and the memory of HIV

A brief passage through a different area can shed some light on how scientific denial can become the ground for political subjectivation. In the first years of 2000, Didier Fassin led a research project in South Africa with the aim of outlining a political anthropology of the HIV/AIDS epidemic, bringing political debates and patients' life stories together. Among the aspects considered by Fassin, who presented the results of his work in the book *When Bodies Remember* (Fassin, 2007), is the role of 'dissident' theories about the HIV virus, theories openly supported by the then South African president Thabo Mbeki. It is important to remember that South Africa is one of the countries where HIV spread most rampantly. To get an idea, in 1995 the prevalence of HIV among South Africans aged between 15 and 49 was estimated at 4.5%, whereas in Brazil, for instance, the estimate was 0.3% for the same year. Four years later, in 1998, the estimate had risen to 9.7% in South Africa, i.e. more than double, while in Brazil it had only gone up to 0.4%. In 2000, in Brazil, the percentage of people living with HIV remained unchanged, while in South Africa it reached 12.6%, with an estimated 100 thousand deaths attributable to HIV/AIDS.[18] In May that year, President Mbeki, who followed Nelson Mandela in the second government elections since the end of the apartheid, decided to make the HIV epidemic a priority of his mandate and formed a Presidential Panel on AIDS made up of 33 international experts. To the astonishment of many observers and activists, both inside and outside the country, Mbeki wanted the panel to also include supporters of the 'dissident' views who denied the existence of a relationship between HIV and the acquired immune deficiency syndrome, among whom the already infamous Peter Duesberg and Harvey Bialy.[19]

In July that year, few days before the second meeting of the presidential panel, the 13th International AIDS Conference was held in Durban. In his opening speech, Mbeki avoided any reference to the relationship between HIV and AIDS, insisting that the fight against poverty and malnutrition would be much more efficient than the administration of costly Western drugs. Besides, and in spite of great resistance from the conference organisers,

---

[18] Sources: Data Bank (available at: http://data.worldbank.org), based on estimates from UNAIDS and the Global Health Observatory of the World Health Organization (available at: http://www.who.int). Current data indicate that the epidemic shows no signs of slowing down in Africa: all countries with two-digit rates of infection belong to the African continent, even if mortality rates have come down significantly. South Africa currently comes fourth in the ranking of countries with the highest incidence of HIV infections, with an estimated rate of 18.9%, preceded by Botswana with 20.7%, Lesotho with 22.8% and Eswatini with 27%.

[19] For a fascinating reconstruction of HIV dissidence from a sociology of science angle, including interviews with some of the protagonists, see Bucchi (1998).

he insisted that Christine Maggiore – an HIV-positive activist and denier, well-known for her campaigns against antiretroviral drugs – be included as a speaker at the conference. In the meantime, and relevant to the discussion here, what stands out from the study by Fassin (2007) is how he sees 'dissident' theories, like those adopted by president Mbeki and many South Africans, as part of a movement that is first and foremost political. In other words, the discourse of denial holds value, in that context, not for its intrinsic truth, but for the political standing it enables.[20]

According to Fassin (2007), it would be clearly insufficient to invoke the population's superstition and scientific illiteracy, on the one hand, and Mbeki's cynical intention to manipulate – if not even his alleged paranoia – on the other, for the purpose of understanding (i.e. adequately describing) the role played by HIV denial in South Africa. In other words, as the French anthropologist observed, the dissemination of certain discourses should also be analysed in 'epidemiological' terms: these discourses do not spread only due to the force of their apparent internal logic, they need to find proper ground to be able to proliferate. We may recall that, after a short period of relative prominence in Europe and the United States, HIV denial had essentially sunk into oblivion. It is with Thabo Mbeki and within the political, social and epidemiological environment of the new South African democracy that it is revived. Returning once again to Fassin (2007), in order to understand the role of those 'heretical' theories, we have to bear in mind that the HIV epidemic in South Africa follows a very precise racial distribution (in 2008, 13.9% of the black population was HIV-positive, against 0.3% of whites)[21] and developed during the first decade of democratic government in the country, following more than forty years of apartheid and centuries of colonial exploitation.

Therefore, it is impossible to appreciate Mbeki's denial – often interpreted as a result of ignorance, if not foolishness – without seeing it as an attempt to oppose reducing the HIV problem in South Africa to its biomedical dimensions and a matter of individual responsibility, and to highlight its inextricable historical, social and political implications. It may be said this means unduly mixing two 'substances' that ought to be kept well apart: science, on the one hand, and the sphere of social and political relations, on the other. That science and society are different lines of business that can somehow be kept separate is much

[20] Hristov (2019) highlights this aspect with regard to conspiracy theories.
[21] Data taken from Shisana *et al*. (2009).

easier said than done, especially when the lives of many people are impacted.[22] Fassin's work in South Africa clearly shows how discourses of denial and conspiracy can be not only the symptom of an underlying dis-ease, but also the very ground for collective subjectivation. Far more than just an 'effect' of the racism and inequality that deeply structure South African society, heretical theories set in motion real mass movements of political resistance,[23] though this does not justify what those views had of scientifically untenable, ambiguous and even harmful.[24]

Conclusion

Climate change denial, too, should not be interpreted as the result of ignorance, a general fear of change or manipulation – nor only as the symptom or surface effect of an underlying social dis-ease – but rather as an instance of political subjectivation. The passage from one heresy to the next – here, from the HIV epidemic in South Africa to climate change denial – implies, of course, several important distinctions. The fact that there are elements of scientific denial involved in individual and political processes of subjectivation in both contexts does not imply they cannot be radically different. First of all, in relation to climate change denial, nothing even remotely resembles the terrible suffering and structural violence of the HIV epidemic in South Africa. The violence of forced migration, hunger, poverty and other disastrous effects of climate change, which will continue to increase, may come to mind, but they are definitely not what motivates sceptical discourse. Besides, the fossil fuel industry is invested in the production and dissemination of theories of denial in a way that

[22] The work by evolutionary biologist Rob Wallace, whose early research shows precisely how the geographical diffusion of AIDS in several major metropolitan areas of the US reveals a form of social and racial apartheid (Wallace, 1995), is a remarkable example of how the natural and social sciences can interlock in both a rigorous and radically critical way. On the political economy of zoonotic diseases, see Wallace (2016), and for a recent publication on COVID-19, Wallace (2020).

[23] On the need to see discourses of conspiracy not as the result of ignorance and manipulation, nor only as the effect of social problems, but as a form of political action (with considerations that can be widened to denial), see Hristov (2019).

[24] This is particularly thorny ground. According to Chigwedere (2008), Thabo Mbeki's later decision to not allow the administration of antiretroviral therapy by the national healthcare system may have caused hundreds of thousands of avoidable deaths. However, the crux of the issue lies in the possibility of distinguishing between understanding and justification, something the conservative criticism of 'sociologism' considers impossible. The statement issued in 2015 by the then French prime minister Manuel Valls, "to explain Jihadism is already, in part, to want to justify it", sparked a heated debate on the subject, partially reconstructed in Rebuschi and Voléry (2019).

cannot be compared to what happened with the dissidence surrounding HIV.[25] However, what both have in common is discourses that openly contradict views supported by the majority of the scientific community, backed by theories that – more than for their, almost irrelevant, truth-value – work as forms of reaction and resistance that operate at a social and political level and should, therefore, be approached as such. For sceptical discourse to gain some traction, however, it has to find fertile ground, it has to be able to capture and tap into various driving forces. The fact is there is a relatively stable production of 'heretic theories', of more or less extravagant counter interpretations and denunciations of conspiracies being woven in the dark: something that not long ago would have been put on the back burner of 'urban legends'.[26] The truth is, if they were only to rely on their internal force, those 'narratives' would probably have no more than a marginal and harmless circulation. Only to the extent that they can take part in wider connections and alliances can they attain greater visibility and more tangible effects. It is when they start 'making sense', i.e. when they produce both meaning and direction, that they become relevant and effective collective phenomena.

Up until the first decade of the 2000s, oil companies were the most lucrative, having always sought to ensure the stability of their high profits, keeping a tight control on the definition of prices[27] and making sure nothing prevented the continuous growth of consumption. Before the risk of losing the large profit margins ensured by the extraction, refining and distribution of fossil fuels, there is, of course, every interest in supporting and reinforcing climate change denial. However, even bearing in mind the propaganda efforts of the fossil fuel industry, everything suggests that the spread of denial is not the mere outcome of a manipulation of consciences. The absence of a correlation between individuals' scientific literacy and their acceptance of theories of denial shows how the 'truth-value' of these theories is far less important than their political affordances. A close examination of those affordances, their implications and ambiguities, is an urgent political task. To interpret climate change scepticism – and other forms of refusing techno-scientific practices and discourses – as the result of a fear of change or manipulation entails neutralising its political core, no matter how ambiguous and contradictory it may be. In fact, approaches aimed at identifying the psychological and cognitive mechanisms that appear to underlie the adherence

[25] In a way, there is a kind of inversion: climate change denial implicitly sides with the interests of the fossil fuel industry, while denial of HIV explicitly intends to go against the interests of large pharmaceutical companies.
[26] The classic reference is Brunvand (2002). More recently, see the work on "low-intensity myths" by Italian sociologist Peppino Ortoleva (2019).
[27] According to the reconstruction of Timothy Mitchell (2011), and unlike what would seem more obvious, mainly through a persistent limitation of production, in a systematic form of 'self-sabotage'.

to climate scepticism are, most of the time, directed at more effective ways of managing public opinion, "[...] because psychological factors are more susceptible to targeted interventions than are demographic constructs" (Hornsey *et al*., 2016). In contrast, I believe that an adequate political response to climate scepticism and denial takes into account the democratic requirement according to which "all those affected by decisions should be included in discussions that reach them" (Young, 2002). Therefore, to recognise climate change denial as a process of political subjectivation does not mean to bring the views of those who acknowledge the reality of climate change and its human origin on a par with those who consider it to be a fraud. On the contrary, it implies underlining how both views are irreconcilable, showing how a possible ground for discussion and conflict is not so much the 'reality of facts', but rather the way those facts shape and legitimate political interventions and projects of social change. Furthermore, to recognise the political implications of the discussion on climate change also does not mean that the views adopted are predetermined by ideological and almost physiological choices, as if there were 'values' that someone embodies and *subsequently* translates into this or that choice. Although segments of the population adhere to climate scepticism out of direct economic interests and to oppose any type of external intervention in the 'laws of the market', many of those who adopt and spread theories of denial do not fall into these categories. For them, perhaps the majority, denial itself works as a catalyst for the construction of a political – or maybe infra-political – attitude. Therefore, what the "merchants of doubt" do is not so much fill empty minds with false ideas or convince the most easily influenced, but rather spread ideas that tap into, reshape and assemble forces that were already in circulation.[28]

To put it differently, only a small (though powerful) minority adopts and spreads climate change denial to defend the free market, while a large number of people adhere to the claims put forth by the first, merely saying something closer to "mind your own business and leave me alone". If ideas of denial were not constantly being produced and spread – and if social media were not so central to our collective life – perhaps the phenomenon would be less prominent. However, if a large number of people did not find in those ideas a form of integration and resistance – however bizarre and paradoxical – it would only be a marginal phenomenon. While it is important to understand and fight the machinery of ideologists, it is even more pressing to understand and fight the conditions that create breeding ground for the

[28] This discourse actually resembles what can be done with contemporary phenomena usually described as "populist".

discourse of scepticism and denial to spread. And these conditions have nothing to do with lack of information or scientific illiteracy. Instead, they are rooted in the fact that parts of society are consistently and completely excluded from the sphere of 'innovation', feeling that a radical technological change would threaten their social and economic situation, which is not always but very often quite precarious. Furthermore, all this happens against a backdrop of growing dissatisfaction with traditional bodies of political mediation (national parliaments, unions, parties, etc.) and increasingly less access to social protection. The political motivation underlying these sceptical views, at least the one that seems most interesting and productive, is the sense of losing any form of collective control over decisions concerning the lives of everyone. Therefore, it is also a resistance to a form of governance that increasingly and more explicitly takes on the form of mere administration delivered in terms of effectiveness and technical reasoning, even when it purports to be progressive and 'sustainable'. The 'fear of change', rather than rejected or neutralised, ought to be decomposed and denaturalised: if there is fear of change, it is not of change *tout court*, but of certain forms of change.[29] Again, this does not mean that, once seen as a form of resistance, denial is acceptable or justified. The erosion of state sovereignty and the loss of democratic control did not start with the UN climate conferences, the Working Group on the Anthropocene or the 'carbon tax', but with the neoliberal reconfiguration that came into being in the 1980s. That is, with an increasingly direct and radical intervention from transnational bodies such as the IMF, the WTO, the World Bank, rating agencies, big tech companies, etc., all of which have initiated processes linked to the dismantling of social protection systems that today, and increasingly so since the 2008 financial crisis, create exclusion, precarity and resentment before the prospect of further change (Castel, 2002). With a brilliant end game move, the strange blend of racist authoritarianism and libertarian impulses of the so-called 'alt-right' – neoliberalism's Frankenstein (Brown, 2018) – has come to capture and mobilise no more no less than that resentment and those anxieties. The 'sad passions' that have issued from the neoliberal counter-revolution, and particularly from its present crises, are thus mobilised to protect the accumulation chains of fossil fuel capitalism or, at least, afford them some time.

In May 2019, the US Department of Energy approved an increase in the exports of liquefied natural gas from the Freeport LNG Terminal, located on Quintana Island, Texas. Trump administration officials – while taking part in the Clean Energy Ministerial in Vancouver, Canada, at a very timely moment – celebrated the expansion of US gas

[29] A possible analogy with Luddism resurfaces here (see footnote 16).

production and exports with obvious enthusiasm and a degree of 'poetic licence'. "With the U.S. in another year of record-setting natural gas production", said Steven Winberg, Assistant Secretary for Fossil Energy, "I am pleased that the Department of Energy is doing what it can to promote an efficient regulatory system that allows for *molecules of* U.S. *freedom* to be exported to the world" (Department of Energy, 2019; italics added). On the same occasion, the Deputy Secretary of Energy, Mark W. Menezes, announced: "Increasing export capacity from the Freeport LNG project is critical to spreading *freedom gas* throughout the world by giving America's allies a diverse and affordable source of clean energy" (Department of Energy, 2019; italics added).[30] Although the United States are known for associating freedom with various material elements,[31] there is probably more to say about freedom and fossil fuels. The connection between neoliberalism and climate change denial goes beyond ideology and greed, especially if we follow those who see neoliberalism not simply as an economic program but as a project of social and political transformation that uses the economy, as Margaret Thatcher argued, as a way "to change the heart and soul" (*apud* Butt, 1981).[32] One of the key aspects of denialist resistance is a claim for freedom construed in individual terms. The freedom of the climate denier is the freedom to make choices, to express a will unobstructed by 'external' constraints, and endowed, more by right than by nature, with an 'internal' autonomy that needs to be ensured and defended at any cost. The autonomy of the subject promoted by late neoliberalism – perhaps the culminating point of crucial vectors of modernity[33] – is essentially a denial of the interdependence that connects us to others and to the natural processes that surround and permeate our lives. To cite *Home*, the famous documentary by Yann Arthus-Bertrand (2009): "This pocket of sunlight [i.e. oil] freed humans from their toil on the land. With oil began the era of humans who break free from the shackles of time. With oil, some of us acquired unprecedented comforts".[34] The connection

---

[30] In a sarcastic reaction to the Department of Energy's accidentally humorous attempt at propaganda, climate scientist Michael Mann suggested that solar energy be renamed "photons of freedom" (Unwin, 2019).

[31] Usually edible items, most infamously French fries and cabbage, and always with a view to nationalist, if not explicitly xenophobic, propaganda (see Morgan, 2018).

[32] Among much relevant research to this approach, besides the groundbreaking work of Michel Foucault (2008), reference here is limited to Dardot and Laval (2016) (particularly chapter IX, "The factory of the liberal subject"), Wacquant (2012) and Pinzani (2019).

[33] According to Castel (2002), the uncritical naturalisation of modern "disembeddedness" (Giddens) and the more recent notion of "risk" (Beck) can be read along these lines.

[34] A controversial 'pop' environmentalist who does not disdain major capital funding, Yann Arthus-Bertrand has also been called an "helicologist" for his extensive use of helicopters in his films. His approach is moralising, frankly depoliticising and does not go much beyond the level of individual responsibility (Divry, 2007; Mitrofanoff, 2005). However, I am not sure his arguments, and many others like his, can only be explained in

between freedom and denial reaches its highest intensity, far beyond ideology or 'interest', if we consider, as Timothy Mitchell (2011) points out, that the apparently inexhaustible (and actually 'incalculable') nature of fossil fuel reserves is among the historical elements that underpin the principle of unlimited growth. And the prospect of unlimited growth is, precisely, the 'engine' behind understanding collective relationships as a set of interactions between free and autonomous – and free because autonomous – subjects. As a result, what denial denies is also the fact that this invisible and apparently inexhaustible source of energy can now be confronting us with the limitations of that type of autonomy and freedom. The most urgent and difficult challenge is to undo this double bind, the mortal embrace between freedom and individual autonomy, and find new ways to think and live freedom no longer as freedom *from* but as the possibility of freedom *with*, a freedom shared with others and with the material processes in which we are, in several respects, involved. This is in no way an easy or merely theoretical task. Enthusiasm for the idea of including citizens in the decision-making processes of experts (consensus conferences, citizens' forums, etc.) has diminished during the last decade, while technocracy is far from losing its appeal.[35] At the same time, considering the ease with which government agencies and large companies launch into initiatives to include stakeholders in the name of a more distributed governance, doubt and distrust are unsurprising and often healthy reactions.[36] Today, however, besides deconstructing theories of denial, scientists, mediators and all 'interested parties' have to find new institutional ways of discussing and negotiating the interrelated social, political and environmental implications of scientific and technological change, widening the possibility of open debate and the access to decision-making processes as much as they can.[37] For the de-hierarchisation of decision-making not to be captured by another sham that actually legitimates power asymmetries, all our efforts and vigilance are called upon.

---

terms of hypocrisy. He should at least be credited with a down-to-earth matter-of-factness that is quite fascinating, as when, for example, he admits that "it is hard to fight against something that makes our life better" (*apud* Le Cocguen, 2021).

[35] See, for example, Boniolo (2012).

[36] On governance as an instrument of decision and legitimation, see Sandro Chignola, "In the shadow of the state. Governance, governamentalitá, governo" (in Chignola, 2018, p. 89–110).

[37] Though with distinct styles and paths, this is the view held by scholars like Sheila Jasanoff and Nikolas Rose, who have both authored a remarkable body of work (see, for example, Jasanoff 2012, 2016 and Rose 2007). Along many others, they belong to what Philip Mirowski, in a recent and noteworthy critical intervention (Mirowski, 2020), labelled the "Levellers" in science and technology studies, which, according to him, show "the predisposition […] to prescribe ever-increasing 'openness', which includes enhanced 'transparency', doing away with hierarchies, and trashing formal barriers to entry and credentialism, often in the name of 'diversity'". This is opposite to the 'predisposition' of the "Diggers" in STS, "united in their attempts to justify and defend scientific expertise". Mirowski's accusation that Levellers are the unwitting allies of neoliberals is particularly unsettling and will likely be explored in a paper to follow.

References

Arthus-Bertrand, Y. (2009). *Home: A Hymn to the Planet and Humanity*. Produced by Denis Carot and Luc Besson. Documentary film. Colour, 120 min.

Ashe, T. C. (2012), *The Politics of Climate Change. Power and Knowledge in Environmental Politics*. PhD Dissertation. University of London: London.

Boniolo, G. (2012). *The Art of Deliberating: Democracy, Deliberation and the Life Sciences between History and Theory*. Dordrecht: Springer.

Brown, W. (2018). "Neoliberalism's Frankenstein: Authoritarian Freedom in Twenty-First Century 'Democracies'". *Critical times*, vol. 1, no. 1, pp. 60–79. DOI: 10.1215/26410478-1.1.60. Available at: http://read.dukeupress.edu/critical-times/article-pdf/1/1/60/683046/60brown.pdf.

Brunvand, J. H. (2002). *Encyclopedia of Urban Legends.* New York: W. W. Norton & Company.

Bucchi, M. (1998). *La scienza imbavagliata. Eresia e censura nel caso Aids*. Arezzo: Limina, 1998.

Bucchi, M. (2009). *Beyond technocracy: Science, politics and citizens*. Dordrecht: Springer. DOI: 10.1007/978-0-387-89522-2.

Buis, A. (2019). "Why a Growing Greenland Glacier Doesn't Mean Good News for Global Warming". *Climate Change: Vital Signs of the Planet* [Blog Post]. October 21. Available at: https://climate.nasa.gov/blog/2925/why-a-growing-greenland-glacier-doesnt-mean-good-news-for-global-warming/.

Butt, R. (1981). "Mrs Thatcher: The First Two Years". *Sunday Times*, May 3. Available at: https://www.margaretthatcher.org/document/104475.

Carvalho, B. L. P. de (2016) "O negacionismo do Holocausto na internet: o caso da 'Metapédia – a enciclopédia alternativa'". *Faces da História*, vol. 3, no. 1, pp. 5–23. Available at: https://www.academia.edu/26614572/O_negacionismo_do_Holocausto_na_internet_o_caso_da_Metape_dia_a_enciclope_dia_alternativa_.

Castel, R. (2002). *L'insecurité sociale: Qu'est-ce qu'être protégé?* Paris: Seuil.

Castro, R. F. de. (2014). "O negacionismo do Holocausto: pseudo-história e história pública". *Resgate: Revista Interdisciplinar de Cultura*, vol. 22, no. 2. Available at:

https://www.academia.edu/10534925/O_Negacionismo_do_Holocausto_pseudo_história_e_história_pública.

Chignola, S. (2018). *Da dentro. Biopolitica, bioeconomia, Italian Theory*. Rome: DeriveApprodi.

Chigwedere, P., Seage, G. R., Gruskin, S., Lee, T.-H., Essex, M. (2008). "Estimating the Lost Benefits of Antiretroviral Drug Use in South Africa". *JAIDS Journal of Acquired Immune Deficiency Syndromes*, vol. 49, no. 4, pp. 410–415. DOI: 10.1097/QAI.0b013e31818a6cd5. Available at: http://journals.lww.com/00126334-200812010-00010.

Cook, J., Nuccitelli, D., Green, S. A., Richardson, M., Winkler, B., Painting, R., Way, R., Jacobs, P., Skuce, A. (2013). "Quantifying the consensus on anthropogenic global warming in the scientific literature". *Environmental Research Letters*, vol. 8, 024024. DOI: 10.1088/1748-9326/8/2/024024.

Corbellini, G. (2018a). "Come si possono combattere razzismo e xenofobia con la scienza?". *Wired*, July 18. Available at: https://www.wired.it/scienza/lab/2018/07/18/xenofobia-razzismo-scienza/.

Corbellini, G. (2018b). Interview with Davide Parenzo and Giuseppe Cruciani. "La Zanzara", Radio24, July, 19. Available at: https://www.radio24.ilsole24ore.com/programmi/lazanzara/puntata/trasmissione-luglio-2018-213526-gSLAllWHkC.

Danowski, D. (2018). *Negacionismos*. São Paulo: n-1 edições.

Dardot, P. and Laval, C. (2013). *The New Way of the World: On Neo-liberal Society*. London: Verso.

Department of Energy. (2019). "Department of Energy Authorizes Additional LNG Exports from Freeport LNG". *Energy.gov*, 29 May. Available at: https://www.energy.gov/articles/department-energy-authorizes-additional-lng-exports-freeport-lng.

De Perthuis, Ch. and Faure, A. (2018). "'Gilets jaunes' et taxe carbone, les centimes de la discorde". *La Tribune*, 22 November. Available at: https://www.latribune.fr/opinions/tribunes/gilets-jaunes-et-taxe-carbone-les-centimes-de-la-discorde-798180.html.

Divry, S. (2007). "Les tartuffes de l'écologie". *Netoyens*, 14 October. Available at: http://netoyens.info/index.php/contrib/2007/10/14/Les-tartuffes-de-lecologie-par-Sophie-Divry2.

Ehrlich, P. R. (1968). *The Population Bomb.* New York: Sierra Club/Ballantine Books.

Ehrlich, P. R. and Ehrlich, A. H. (2009). "The Population Bomb Revisited". *The Electronic Journal of Sustainable Development*. vol. 9, no. 3, pp. 63-71. Available at: https://www.populationmedia.org/wp-content/uploads/2009/07/Population-Bomb-Revisited-Paul-Ehrlich-20096.pdf.

Fassin, D. (2007). *When Bodies Remember: Experiences and Politics of AIDS in South Africa*. Berkeley, CA: University of California Press.

Foucault, M. (2008). The birth of biopolitics: lectures at the Collège de France, 1978-79. Basingstoke – New York: Palgrave Macmillan.

Frishberg, H. (2020). "Glacier National Park removes signs warning ice would melt by 2020". *New York Post*, 9 January. Available at: https://nypost.com/2020/01/09/glacier-national-park-removes-signs-predicting-glaciers-will-be-gone-by-2020/.

Gelbspan, R. (1995). "The heat is on: The warming of the world's climate sparks a blaze of denial". *Harper's Magazine*, December.

Gelbspan, R. (1998). *The Heat is On: The Climate Crisis, the Cover-Up, the Prescription*. Reading, Mass: Perseus Books, 1998.

Gifford, Robert. (2011). "The Dragons of Inaction: Psychological Barriers that Limit Climate Change Mitigation and Adaptation". *American Psychologist*, vol. 66, no. 4, pp. 290–302. DOI: 10.1037/a0023566.

Haltinner, K. and Sarathchandra, D. (2018). "Climate change skepticism as a psychological coping strategy". *Sociology Compass*, vol. 12, no. 6, e12586. DOI: 10.1111/soc4.12586. Available at: https://onlinelibrary.wiley.com/doi/full/10.1111/soc4.12586.

Honigsbaum, M. (2010). "Oxytocin: could the 'trust hormone' rebond our troubled world?" *The Guardian*, 21 August. Available at: https://www.theguardian.com/science/2011/aug/21/oxytocin-zak-neuroscience-trust-hormone.

Hornsey, M. J., Harris, E. A., Bain, P. G. and Fielding, K. S. (2016). "Meta-analyses of the determinants and outcomes of belief in climate change". *Nature Climate Change*, vol. 6, no. 6, pp. 622–626. DOI: 10.1038/nclimate2943.

Hristov, T. (2019). *Impossible Knowledge: Conspiracy Theories, Power, and Truth.* Abingdon: Routledge.

Le 1 Hebdo (2018). *Inégalités*: *la révolte des oubliés*, 2018. Available at: https://le1hebdo.fr/journal/numeros/229/inegalites-la-revolte-des-oublies/socit-conomie.html.

Morgan, Jeff. "When Sauerkraut Became 'Liberty Cabbage'". *Medium*, 19 February. Available at: https://medium.com/iowa-history/when-sauerkraut-became-liberty-cabbage-bb84f4369d52.

Jasanoff, S. (2016). *The Ethics of Invention: Technology and the Human Future*. New York: Norton.

Jasanoff, S. (2012). *Science and Public Reason*. Abingdon: Routledge.

Jennings, K., Grandoni, D., Rust, S. (2015). "How Exxon went from leader to skeptic on climate change research". *Los Angeles Times*, October 23. Available at: https://graphics.latimes.com/exxon-research/ (though not to user located in the EU).

Kirchgaessner, S. (2019). "Revealed: Google made large contributions to climate change deniers". *The Guardian*, October 11. Available at: https://www.theguardian.com/environment/2019/oct/11/google-contributions-climate-change-deniers.

Kirk, K. (2019a). "Former 'climate change denier' explains his shift". *Yale Climate Connections*, April. Available at: https://www.yaleclimateconnections.org/2019/04/former-climate-change-denier-explains-his-shift/.

Kirk, K. (2019b). "Fact check: No, the glaciers are not growing in Glacier National Park" . *Yale Climate Connections*, September. Available at: https://www.yaleclimateconnections.org/2019/09/fact-check-no-the-glaciers-are-not-growing-in-glacier-national-park/.

Le Cocguen, L. (2021). "'Legacy, notre héritage'" de Yann Arthus-Bertrand ce soir sur M6 : 'Il n'y a pas de vaccin contre le dérèglement climatique'". *Futura Sciences*, January 26. Available at: https://www.futura-sciences.com/planete/actualites/changement-climatique-legacy-notre-heritage-yann-arthus-bertrand-ce-soir-m6-il-ny-pas-vaccin-dereglement-climatique-85335/.

Lewandowsky, S., Cook, J., Ecker, U. K. H., Albarracín, D., Amazeen, M. A., Kendeou, P., Lombardi, D., Newman, E. J., Pennycook, G., Porter, E. Rand, D. G., Rapp, D. N., Reifler, J., Roozenbeek, J., Schmid, P., Seifert, C. M., Sinatra, G. M., Swire-Thompson, B., van der Linden, S., Vraga, E. K., Wood, T. J., Zaragoza, M. S. (2020). *The Debunking Handbook 2020*. Available at https://sks.to/db2020. DOI:10.17910/b7.1182.

Meyer, R. (2019). "There's Snow on TV, so Trump's Tweeting About Climate Change". *The Atlantic*, January 20. Available at: https://www.theatlantic.com/science/archive/2019/01/its-cold-so-trump-is-doubting-climate-change/580885/.

Mirowski, Ph. (2020). "Democracy, Expertise and the Post-Truth Era: An Inquiry into the Contemporary Politics of STS" [unpublished draft], https://www.academia.edu/42682483/Democracy_Expertise_and_the_Post_Truth_Era_An_Inquiry_into_the_Contemporary_Politics_of_STS.

Mitchell, T. (2011). *Carbon Democracy. Political Power in the Age of Oil*. London: Verso.

Mitrofanoff, K. (2005). "Yann Arthus-Bertrand, photographe". *Challenges*, February. Available at: https://web.archive.org/web/20081209080137/https://www.challenges.fr/magazine/portrait/0110.003155/yann_arthusbertrand_photographe.html.

Noiriel, G. (2019). *Les gilets jaunes à la lumière de l'histoire.* Paris: L'aube.

Olson, R. (2011). "The Nerd Loop: why I'm losing interest in communicating climate change". *The Benshi* [Blog], April 6. Available at: https://web.archive.org/web/20110410220146/https://thebenshi.com/2011/04/06/124-the-nerd-loop-why-im-losing-interest-in-communicating-climate-change/.

Oreskes, N. and Conway, E. M. (2010). *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. New York: Bloomsbury.

Ortoleva, P. (2019). *Miti a bassa intensità. Racconti, media, vita quotidiana*. Turin: Einaudi.

Osborne, M. (2012). "Heading to Hell in a Handbasket". *Generation Anthropocene* [Podcast episode]. Available at: https://www.genanthro.com/2012/06/27/paul-ehrlich-biologist/.

Painter, J., Ashe, T. (2012). "Cross-national comparison of the presence of climate scepticism in the print media in six countries, 2007-10". *Environmental Research Letters,* vol. 7, no. 4, 044005. DOI: 10.1088/1748-9326/7/4/044005. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/7/4/044005.

Petersen, A. M., Vincent, E. M., Westerling, A. L. (2019). Discrepancy in scientific authority and media visibility of climate change scientists and contrarians. *Nature Communications*, vol. 10, no. 3502. DOI: 10.1038/s41467-019-09959-4. Available at: https://doi.org/10.1038/s41467-019-09959-4.

Pinzani, A. (2019). "Neoliberalismo como doctrina ética". *Erasmus*, vol. 21, no. 1/2: 137–156. Available at: http://www.icala.org.ar/erasmus/erasmus.html138.

Powell, J. (2017). Scientists Reach 100% Consensus on Anthropogenic Global Warming. *Bulletin of Science, Technology and Society*, vol. 37, no. 4: 183–184. DOI: 10.1177/0270467619886266. Available at: https://journals.sagepub.com/doi/abs/10.1177/0270467619886266?journalCode=bsta.

Rancière, J. (2019). "As virtudes do inexplicável: a propósito dos coletes amarelos". *Punkto*, January. Available at: https://www.revistapunkto.com/2019/01/as-virtudes-do-inexplicavel-proposito.html.

Rebuschi, M. and Voléry, I., eds. (2019). *Comprendre, Expliquer, Est-Ce Excuser*? *Plaidoyer*

Pour Les Sciences Humaines Et Sociales. Vulaines-sur-Seine: Éditions du Croquant.

Rose, N. (2007), *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century*. Princeton: Princeton University Press.

Shisana, O., Rehle, T., Simbayi, L.C., Zuma, K., Jooste, S., Pillay-Van Wyk, V., Mbelle, N., Van Zyl, J., Parker, W., Zungu, N.P. and Pezi, S. (2009). *South African national HIV prevalence, incidence, behaviour and communication survey, 2008: A turning tide among teenagers?* Cape Town: HSRC Press.

Stoll-Kleemann, S., O'Riordan, T. and Jaeger, C. C. (2001). "The psychology of denial concerning climate mitigation measures: Evidence from Swiss focus groups". *Global Environmental Change*, vol. 11, no. 2, pp. 107–117. DOI: 10.1016/S0959-3780(00)00061-3.

Supran, G. and Oreskes, N. (2017). "Assessing ExxonMobil's climate change communications (1977-2014)". *Environmental Research Letters*. Vol. 12, 084019. DOI: 10.1088/1748-9326/aa815f.

Unwin, J. (2019). "Department of Energy 'molecules of freedom' statement condemned". *Power Technology*, May 31. Available at: https://www.power-technology.com/news/department-energy-molecules-of-freedom/.

Van Rensburg, W. and Head, B. W. (2017). "Climate Change Scepticism: Reconsidering How to Respond to Core Criticisms of Climate Science and Policy". *SAGE Open*, vol. 7, no. 4. DOI: 10.1177/2158244017748983.

Verheggen, B., Strengers, B., Cook, J., Van Dorland, R., Vringer, K., Peters, J., Visser, H. and Meyer, L. (2014). "Scientists' views about attribution of global warming". *Environmental Science and Technology*, vol. 48, no. 16: 8963–8971. DOI: 10.1021/es501998e.

Viterito, A. (2016). "The Correlation of Seismic Activity and Recent Global Warming". *Journal of Earth Science & Climatic Change*, vol. 7, no. 4. DOI: 10.4172/2157-7617.1000345.

Viterito, A. (2017). "Climate Change: Is the Science Settled?", *Environment Pollution and Climate Change*, 2017. DOI: 10.4172/2573-458x.1000e101.

Wacquant, Loïc. (2012). "Three steps to a historical anthropology of actually existing neoliberalism", *Social Anthropology/Anthropologie Sociale,* vol. 20, no. 1: 66–79.

Wallace, Rob. (1995). "U.S. apartheid and the spread of AIDS to the suburbs: a multi-city analysis of the political economy of spatial epidemic threshold", *Social Science and Medicine*, vol. 41, no. 3, 333-45. DOI: 10.1016/0277-9536(94)00349-x.

Wallace, Rob (2016). *Big Farms Make Big Flu*. New York: Monthly Review Press.

Wallace, Rob (2020). *Dead Epidemiologists: On the Origins of COVID-19*. New York:

Monthly Review Press.

Washington, H., and Cook, J. (2011). *Climate Change Denial: Heads in the Sand*. Abingdon: Routledge.

YOUGOV. (2019). International Climate Change Survey. In: *YouGov*, September. Available at: https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/epjj0nusce/YouGov%20-%20International%20climate%20change%20survey.pdf.