Against Overpopulation:

A Critique of Environmental Malthusianism

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Abstract

In this thesis I analyse the argument that there are "too many people" on Earth and that we need to reduce the world population. I trace how the argument has been used throughout history, starting with the work of Thomas Malthus in the late eighteenth century, touching on its application by colonial officials, eugenicists, biologists, conservationists and ecologists, and finally its application in the environmental movement in 1968 by Paul Ehrlich and others. Building on this historical analysis, I address how the overpopulation argument has been taken up by contemporary feminists, most notably by Donna Haraway. Through tracing this argument back to its origins in Malthusian thinking, eugenics, colonialism and antiblackness, I argue that despite being presented as a purely mathematical or scientific theory, the overpopulation argument is co-constituted with, and difficult to disconnect from, these troublesome ideologies. With these ideological origins, overpopulation discourse has a tendency to target specific populations as trouble-populations: the racialised and the poor. Further, by showing the link between contemporary overpopulation and climate change discourses, I argue that the Malthusian legacy in the contemporary Anthropocene narrative is the idea that people are the problem, and therefore a reduction of population growth is the solution. Framing climate change as a man-made problem in this way presents the 'human' as a universal category, concealing intra-human difference, which allows for the development of a climate change strategy focused on population management, birth rates, and reproduction. In order to stop reproducing Malthusian ideas in the climate change discussion today, we must start to question the concepts we think with. A key part of this work consists of refusing universalistic conceptions of the human, such as in the notion of 'population' itself.

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Introduction

The film *Donna Haraway: Story Telling for Earthly Survival* by Fabrizio Terranova (2016) starts with a story about teeth. In a close up of Donna Haraway, she tells a story of how she arrived at Princeton University to give a lecture and was struck by how the students, and herself, all had such straight teeth. This sparked an interest in the history of orthodontia, and Haraway asks how the orthodontist knows when to stop: "What counts as a correct bite?" Of course, people historically had very different teeth, depending on both genetics and how they used their teeth, but when dentists came together in the nineteenth century to consolidate orthodontia into a discipline, they organised it around an idea of the 'correct facial angle' – "straight out of racial anthropology," as Haraway notes (Terranova 2016). Additionally, she points out that the 'correct facial angle' was calculated based on statues of Greek gods (i.e., no human population that has ever lived on Earth). The question Haraway poses stays with me: how does the orthodontist know when to stop? How do humans/scientists/politicians ever know when to stop fixing something? If dentists try to make your bite into the closest approximation of a Greek statue, what is the metaphorical Greek statue of other disciplines, such as population science?

Somewhat ironically, the question returns in response to another argument made by Haraway herself, in her 2016 book *Staying With the Trouble: Making Kin in the Cthulhucene*. Here, Haraway argues that ongoing environmental destruction is tied to human numbers and the predicted 7-11 billion human beings are frankly too much for the planet to bear (Haraway 2016, 102, 208). She proposes the new slogan "Make kin, not babies," noting that she is against coercive population reduction practices but hopes that a different kind of kin-making could reduce the number of human people to "2 or 3 billion or so, while all along the way being part of increasing well-being for diverse human beings and other critters as means and not just ends" (Haraway 2016, 103). In making this argument, Haraway consciously joins a debate tangled up in neo-colonialism, racism

and misogyny, acknowledging that discussing the so-called 'population explosion' "can feel like going over to the dark side" (208). Yet she still feels that it is necessary. And I wonder – if we could reduce the global population, even in a non-coercive way, how would we know when to stop? Why is 11 billion humans too many, but 2-3 billion is okay? Where is the model on which the ideal population can be based?

These questions prompted my engagement with the overpopulation argument for this thesis. I was wondering why Haraway chose to make this turn in her research, and why other feminist thinkers so staunchly reject it (see for example Hartmann 2014, Hendrixson and Hartmann 2019, Lewis 2017, and Sasser 2014). The notion that there are 'too many' people for a limited environment has captured the public imagination time and time again. There appears to be a commonsensical understanding of the notion of 'natural limits' to population growth, and with it a deeply held belief that human populations can exceed the Earth's carrying capacity. At present, concerns with overpopulation are linked to questions of climate change and the Anthropocene, framing overpopulation as a global environmental threat. This is the angle Haraway (2016) takes, positioning global human numbers as a threat to ongoing liveability on the planet for both humans and non-humans. The term 'Anthropocene' is the proposed name for the present geological epoch, signified by humans taking on the role as geological actors – i.e. that human actions are the biggest drivers of environmental change. Regardless of whether the term is officially accepted or not – it is still debated which start date should be recognised, although the deciding body, the International Committee on Stratigraphy, is leaning toward the 1950s (Luciano 2015) – it has already shaped discussions in a range of fields, and it has also been extensively critiqued by feminist and decolonial scholars, including by Haraway herself (2016, 47). However, it seems that in the context of the overpopulation discussion, the notion of the Anthropocene lends itself to a simple but convincing argument: if our present environmental problems are caused by human beings, then humans are the problem, and if we reduced the number of humans the problems would disappear, or at least be

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reduced. Even when we call attention to the harmful impact of human processes, like capitalism and overconsumption, it still appears to stand to reason that if *fewer* human beings engaged in those processes, the problems would be reduced. It is this commonsensical understanding of the overpopulation argument that I will trouble in this thesis, and I will particularly call attention to the role of numbers and calculations in this discourse.

As it stands today, dominant discourse tends to identify the global population as universally 'too much' and targets those areas that have the quickest growth rate, regardless of per capita environmental impact (Hartmann 2014). Diana Ojeda, Jade Sasser, and Elizabeth Lunstrum (2020) call attention to studies that draw a direct link between population growth and carbon emissions, modelling large-scale trends and projections. Within this perspective, China's one-child policy has been presented as a climate change mitigation strategy that has already "averted" billions of tonnes of carbon dioxide by preventing the birth of approximately 300 million people since the implementation of the policy (319). This perspective leads to a "calculus in human lives, in which some lives are deemed avertable in the service of global scale environmental goals" (319). In practice, this results in policies and projects that primarily target women of colour in the poorest areas of the world. Betsy Hartmann (2014) calls attention to the many international strategies to reduce fertility in sub-Saharan Africa as a means to mitigate climate change, and points out one significant (now discontinued) project where investments in a family planning program in Madagascar counted as carbon compensation (766). Merrill Baker-Médard and Jade Sasser (2020) also call attention to projects on Madagascar in particular, where birth control is presented as a cost-effective conservation strategy. The argument goes that through projects that distribute different kinds of birth control, the 'population pressure' on Madagascar will be reduced, thus protecting the fragile marine ecosystems where many of these people get their food – this despite the fact that more than half of the marine products harvested there are exported internationally (18). This

example illustrates the trend of shifting responsibility and focus away from the global interests of capital, and onto the poor, whether it is a matter of carbon emissions or local ecosystems.

In light of these trends in the overpopulation discourse, I argue that there is a need to critically evaluate not just population control policies, but the ideas that give rise to them in the first place. In making this argument, I will not claim that humans are *not* a driving force behind many environmental harms, but I will complicate this narrative. When we speak of 'populations' or 'human beings' in the aggregate as threatening the environment, the problem easily becomes human numbers rather than human activities, and intra-human difference difference is easily lost in the debate. I therefore reject Haraway's argument that anti-racist feminists's avoidance of the 'trouble' of growing human populations is "akin to the denial of anthropogenic climate change by some deeply believing US Christians" (2018, 87). Instead, I argue that we can take the reality of climate change seriously, and accept that global-scale changes to the climate and the environment have been induced by human actions, while also criticising the problematic neo-Malthusian assumptions underlying the overpopulation argument. When Haraway argues that population questions are "much too important for Terra [the Earth] to hand them over to the Right or to development professionals or to anybody else in the business-as-usual camps" (2016, 209), it is examples like the above which she rightly turns against. However, I disagree with her conclusion that we must find anti-racist decolonial feminist politics for non-coercive anti-natalism, i.e. find feminist ways of reducing the population size down to "2 or 3 billion or so" (2016, 103). Haraway asks: "How to be simultaneously against population control apparatuses, like those reported by Kalpana Wilson,[1] and for a less human-heavy world through parent-and-child friendly means?" (Haraway 2018, 98). But I wonder why we need to accept the notion of a 'human-heavy' world at all?

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[1] Wilson's examples include forced sterilisation, deaths in sterilisation camps, doctors, health centres and NGOs being paid 'incentives' per person they sterilise (thus further incentivising non-coercive measures), 'dumping' of hormonal contraceptives by pharmaceutical companies looking to get rid of stocks that have been prohibited in the West, and international aid being made conditional on use of contraceptives or sterilisation. See Wilson 2012, 2017a, 2017b.

As the title of her 2016 book puts it, Haraway argues that we must "*stay with the trouble* of living and dying in response-ability on a damaged earth" (2016, 2, emphasis added). One of the 'troubles' she has identified is the problem of too-many human numbers, but what if she has misidentified the trouble that we need to stay with? The problem of human numbers is posed within the existing system of knowledge, where the unmarked category of the human comes to stand in for the human species as a whole, or for the eponymous *anthropos* of the Anthropocene. If indeed the human as a whole is the *anthropos*, it may need to be reduced, but if the *anthropos* does not equal the human species, then the problem lies elsewhere and the climate crisis cannot be solved by adjusting human population size. The question of the ideal population circumvents the real problem, which is displaced onto 'surplus population' so 'we' can keep living as we are. Here I turn to the work of Sylvia Wynter, who positions the 'human' as a mode of *doing* rather than a mode of being, and argues that the dominant conception of the human at present follows a Western, capitalist script for how to 'do' humanness (Wynter 1995, 2003, and Wynter and McKittrick 2015). From within this mode of thinking, which aims to preserve the status quo of Western Man as the only correct way to be human, any proposals to address climate change will be devastating (Wynter and McKittrick 2015, 24). In order to address climate change and other environmental problems, one must step outside of this mode of knowing and transform the notion of the human and its relationship to nature. So, instead of 'staying with the trouble' of overpopulation, I argue that we must stay with the trouble of the universalistic conception of Western Man as the human, as *anthropos*. In order to make this argument, I turn to another well-known Haraway quote:

> It matters which stories tell stories, which concepts think concepts. Mathematically, visually, and narratively, it matters which figures figure figures, which systems systematize systems. (Haraway 2016, 101).

Taking this claim seriously, in this thesis I will critically unpack the overpopulation narrative and its key concepts: population, the human, the Anthropocene, and carrying capacity. I will also pay attention to figures and mathematics, tracing how mathematical concepts and statistical figures function to paint a picture of a world that is at risk of becoming, or already is, overpopulated. Using a decolonising and antiracist perspective, I will call attention to how these figures and concepts emerged as part of a racist and colonialist knowledge system.

To do this work, I have chosen to use genealogy as a method for questioning overpopulation discourse and its claims to universality and scientific veracity. Genealogy, as conceptualised by Michel Foucault (1977, 2003), is a critical historical practice that reflects on power relations and the production of truth and knowledge. It is not a matter of finding 'origins' or establishing a historical continuity of past events into the present (1977, 144-146). Instead, Foucault writes:

> Genealogy does not resemble the evolution of a species and does not map the destiny of a people. On the contrary, to follow the complex course of descent is to maintain passing events in their proper dispersion; it is to identify the accidents, the minute deviations—or conversely, the complete reversals—the errors, the false appraisals, and the faulty calculations that gave birth to those things that continue to exist and have value for us; it is to discover that truth or being do not lie at the root of what we know and what we are, but the exteriority of accidents. (Foucault 1977, 147)

Foucault rejects the notion of 'natural' progress or 'evolution' of concepts, instead viewing history as a power struggle, where the present is not a predetermined outcome but rather a result of multiple accidents. Therefore, in Foucault's own words, "[t]he purpose of history, guided by genealogy, is not to discover the roots of our identity but to commit itself to its dissipation" (Foucault, 1977, 162). It is a matter of undoing the 'commonsensical' or 'self-evident' understanding of our present

by undoing its roots. Genealogy is in this way an "antiscience," argues Foucault, in the sense that it is not trying to find a 'more accurate' or empirical science but rather turns against the "centralizing power-effects that are bound up with the institutionalization and workings of any scientific discourse organized in a society such as ours" (2003, 9). He writes:

> It is a way of playing local, discontinuous, disqualified, or nonlegitimized knowledges off against the unitary theoretical instance that claims to be able to filter them, organize them into a hierarchy, organize them in the name of a true body of knowledge, in the name of the rights of a science that is in the hands of the few." (Foucault 2003, 9)

The core of genealogy is thus a critique and troubling of established systems of knowledge, an "insurrection of knowledges" (9). Foucault further suggests that this counter-knowledge can be used strategically, as a tactic in the struggle against universalistic scientific knowledge (10). An effective history, then, is one that is able to "decentre man as the subject of historical becoming and shatter the certainties of our very existence" (Tamboukou 1999, 210). The goal is to create a counter-memory that destabilises established 'truths' in order to open up new possibilities of life – "the possibility of no longer being, doing or thinking what we are, do, or think" (Mahon 1992, 122). So while genealogy constitutes a "history of the present" (Kearins and Hooper 2002, 735), it is strategically oriented toward the future.

Kate Kearins and Keith Hooper (2002) note that Foucault himself offers no specific theory or methodology of how to do genealogy, no Foucauldian "schema" or "global principle for analyzing society" (735). However, extrapolating from Foucault's own applications of genealogical analysis, they sketch out a few guidelines. First, the past is analysed from the perspective of the present – not history in terms of the present, which could be accused of ethnocentrism, but rather an analysis of the past insofar as it can account for the constitution of the present object of analysis (739). Second,

they argue that historical documents should be a key element of the analysis. Lastly, the selection and delineation of historical material should be pragmatically-oriented: "the investigator owes the reader an account of why the practices he describes should produce the shared malaise or contentment which gave rise to the investigation" (739[2]). The project becomes, in a sense, circular, where the present object of analysis guides the selection of historical material that explains the present object. In this thesis, I perform a genealogy of the concept of overpopulation in order to reconstruct the processes by which overpopulation was consolidated as an established discourse, and thereby destabilise and critique its use in contemporary environmental debates.

I begin in chapter one with the work of Thomas Malthus, who formulated his *Principle of Population* in 1798. Robert Fletcher, Jan Breitling and Valerie Puleo argue that while Malthus was not the first to discuss overpopulation, he has been by far the most influential, and "arguments drawing on his ideas have resurfaced with clocklike regularity in both scholarly and popular discourse as well as public policy arenas," taking on the status of "'hegemonic myths' within modern society" (2014, 1198). In this chapter I trace the emergence of Malthus's ideas, discussing the context in which he gathered information and data, and further analysing some of the implications of Malthus's theory. Two key aspects of Malthusian influence is his contribution to the development of population statistics (later demography) and the reliance on 'objective' numbers, and his naturalisation of poverty, war, famine and disease as a consequence of overpopulation. The latter argument served to conceal other explanations of human miseries, such as capitalism, racism or colonialism (Wilson 2012, 71). The chapter proceeds by tracing the use of Malthusian overpopulation arguments over the next two centuries, and its usage by some key writers and thinkers. I discuss its application in the context of colonial expansion, where Malthusianism was used to support several contradictory arguments: for colonialism, for a sort of limited anti-colonialism, and for a sort of internationalism or cosmopolitanism. Next, I turn to how Malthusian

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[2] Here Kearins and Hooper are citing Hubert Dreyfus and Paul Rabinow.

ideas were picked up by Charles Darwin, and from there developed into the project of eugenics by Francis Galton in the late nineteenth century, where it also intersected with the birth control movement and the early Women's movement via thinkers like Annie Besant and Margaret Sanger. The field of eugenics grew rapidly from the 1880s and peaked in the 1920s, where the focus shifted from the overtly racist notion of biological difference to a concern with economics and development. Key actors in this shift were the demographer Warren Thompson and the biologist Raymond Pearl. Lastly, I look at the implementation of Malthusian ideas in connection to the environment, starting with the work of conservationist and ecologist Aldo Leopold in the early to mid-twentieth century, and ending with the emergence of the modern environmental movement in the 1960s and the population panic that followed Paul Ehrlich's book *The Population Bomb* in 1968. This is a history that is by today's standards alternately progressive and horribly racist, intermingling calls for women's emancipation with eugenic ideas, arguing against colonialism and for indigenous genocide in the same breath. The idea of overpopulation is intimately tied up with ideas of human difference and notions of what the ideal human that makes up the ideal population should look like. By presenting this complex history in all its messiness, I show how this history is still haunting the present, revealing the historical echoes in contemporary population discussions.

In chapter two I turn to a deeper engagement with Donna Haraway's argument, unpacking her claims and motivations. Since her argument is based on a concern with human-induced climate crisis, I also turn in this chapter to the concepts of the Anthropocene and the human. The central question of this chapter is whether the Anthropocene, or more specifically the notion of human-made climate change, warrants new concerns about overpopulation? Considering that the idea of overpopulation has a long and problematic history, is there something about the present situation which gives it new legitimacy? Here I argue that the Malthusian legacy of the Anthropocene narrative is the idea that human numbers are the problem, rather than some other process like capitalism, industrialism, or imperialism. Furthermore, a key problem of the Anthropocene narrative

that it shares with the overpopulation argument is the universalisation of the human into one singular population, the human species as a whole, or the *anthropos*. The concepts Anthropocene and overpopulation are both used to universalise humans, emphasising species solidarity and concealing intra-human difference, thus removing the onus on the West to change their behaviour. Here I draw on several scholars's important work to decolonise the Anthropocene narrative, notably Kathryn Yusoff (2018) and Simon Lewis and Mark Maslin (2015). Their work on the origin stories of the Anthropocene reveal that while the specific dates are still up for debate, none of them point to human numbers as the driving force of environmental change. Rather, it is the behaviour of humans, and a small elite group of humans at that, which has caused the changes that warrant the designation of a new geological epoch. Following on from this, the question arises of who the eponymous *anthropos* really is, and here I turn to Sylvia Wynter's (1995, 2003, Wynter and McKittrick 2015) work to unpack the concept of the human. Wynter strives to problematise the "referent-we" of humanity (Wynter and McKittrick 2015, 24), that is, the notion that there is a common 'we' of the human population. Both the overpopulation and the Anthropocene narrative tends to rely on this common 'we,' and by troubling this concept and rejecting universalistic narratives, the debate becomes more nuanced and complex.

In the third and final chapter, I turn to the problem of numbers and figures. As Haraway puts it, this chapter is concerned with "which concepts think concepts" and "which figures figure figures" (2016, 101). Returning to Foucault's work, I discuss the emergence of the concept 'population' itself, in order to question what kind of discourse the concept enables – or makes impossible. Foucault argues that 'population' emerged as the subject of biopolitical governance in the eighteenth century, and is continually created through statistical measurements and demographic trends. These mathematical and numerical aspects of the population concept lends it an air of objectivity, concealing the fact that it, like other concepts, is an abstraction, a theorisation. This causes trouble when 'population' is then put to use as an objective variable in the calculation of

'carrying capacity,' the notion that there is a calculable upper limit to the amount of x that y can carry. When this is applied to human populations (x) carried by the Earth (y), carrying capacity is used to 'mathematically' verify that overpopulation is a problem. However, following Nathan Sayre's (2008) genealogy of 'carrying capacity,' I critically evaluate whether carrying capacity as a concept is 'good' to think with. When it is applied to populations outside of a laboratory environment, there are too many fluctuating variables to be able to accurately predict an upper limit to population size. The concept thereby becomes empirically weak, as it cannot be tested nor refuted, and therefore can only be presumed to exist in the real world, to little use of someone trying to determine the ideal population size. Lastly, I touch on the underlying thread of racism that is implicit in the notion of an 'ideal' population since its emergence in the eugenics movement, or even earlier, in Malthus's writings. The statistical production of the 'population' concept involves normalising judgements, which serve to reinforce the notion of Man, or the *anthropos* as the normative ideal of the human. Population predictions based on these assumptions are therefore limited to a prediction of what will happen if the discursively produced model of the population prevails, rather than what will actually happen (McCann 2016, 41). In this sense it becomes a self-fulfilling prophecy, which is then used to justify the need for population control – which often targets statistically aberrant populations, notably the poor and racialised.

By tracing the uses of the overpopulation argument in historical and contemporary debates, and from different perspectives, I show how the notion of overpopulation has been constituted within a racist and colonial knowledge system. I can thereby trouble or outright reject the idea that a concern with overpopulation can be 'decolonised' and removed from that context, to be used for feminist arguments.

On the Origin of Overpopulation: A Genealogy of Malthusian Thinking

The idea that there are "too many people" has captured the public imagination time and time again. There seems to be a commonsensical understanding that there must be some natural limit to the environment's capacity to sustain human populations, and a belief that we are now overextending that carrying capacity. In the most recent and ongoing iteration of this idea, it has been linked to questions of climate change and the Anthropocene, framing overpopulation as a global environmental threat, but the fear of 'overpopulation' has much longer historical roots. Anne Hendrixson and Betsy Hartmann point out that when the first warnings of overpopulation were issued, in the late eighteenth century, world population was at just under one billion (2019, 251). In the 1960s, when fears of overpopulation were spreading rapidly within the U.S. environmental movement, global population was at around 3 billion (251). By the year 2000, global population had reached 6 billion and is today at around 7.6 billion, with an estimated further growth to 9.8 billion in 2050 and 11.2 billion by the year 2100, according to the UN's most cited estimates (251). This UN estimate is the number Donna Haraway (2016, 208) references when she says that 11 billion are 'too many' human beings for the Earth to bear. However, Hendrixson and Hartmann write that "each of these numbers has been argued to represent 'too many people' for available resources" (2019, 251). So which number reflects the maximum human population that the Earth can bear? Have we already crossed that threshold? Despite the varying sizes and growth rates of the population in question, the narrative of overpopulation is remarkably similar through time. In the words of Robert Fletcher, Jan Breitling and Valerie Puleo, critics of the overpopulation argument,

the "resilience of this frame in the face of copious contradictory evidence suggests that its persistence defies purely rational evaluation of the factual basis of the thesis (if such a thing exists)" (2014, 1196). So where does the idea of overpopulation come from, and why is it so pervasive? How was it invented and accepted as a scientific model?

In this chapter, I use the genealogical method to trace the overpopulation argument's development and use in different discourses. Rather than accept overpopulation as a legitimate knowledge, as it is often perceived, I will unpack how this knowledge was first constructed, and how it has been maintained over the years. To this end, I start my analysis with the writings of Thomas Robert Malthus, as his *Essay on the Principle of Population*, first published in 1798, has reverberated throughout subsequent discussions. Malthus posited that the rate of population growth would always be faster than the rate of food production, thus leading to a perpetual threat of scarcity and subsequent miseries. Malthus established the notion of environmental limits to growth, and used these to argue that miseries like poverty, famine and war would always exist as a consequence of humans pushing up against these limits. In terms of what could be done to alleviate these problems, Malthus himself was largely pessimistic, but believed that the more 'civilised' people were, the better they could control the 'natural urge' for reproduction and thus prevent hitting the environmental limits to population.

This chapter proceeds by tracing the spread and development of Malthusian ideas across several disciplines, starting with its application in the colonial context. Here, Malthusian ideas laid the groundwork for three incongruent arguments: the first an argument for colonial expansion via the need for more land and resources for growing populations, the second a limited sort of anti-colonialism that held that land should be distributed based on need rather than colonial occupation, and lastly a form of internationalism that believed global resources should be managed on an international level rather than nationally. However, all of these ideas inherited different problematic assumptions from Malthus, notably his ideas about human difference. This became especially clear

in the next iteration of the overpopulation argument, where the problem of limited land prompted the question of who was best suited to cultivate this land.

I thereby move to the discipline of eugenics, unpacking the Malthusian ideas at the root of this idea. The Malthusian notion of a perpetual struggle for room and food informed Charles Darwin's formulation of the idea of 'natural selection,' which was taken up by eugenicists who believed in the possibility of human-made selection. This field grew from the 1880s, peaked in the 1920s and then changed after the Second World War, when the quite explicitly racist concerns with the 'quality' of the population became politically untenable. Instead, the concern with intentionally managing the population was expressed in terms of social and economic conditions, contributing to the groundwork of what we today understand as the field of international development.

Next, I turn to how overpopulation became an environmental question in the early to mid-twentieth century. Whereas previously the focus had been on the 'population' aspect of the population-environment nexus, these environmental Malthusians were concerned with how to measure and manage the 'environment' aspect of the equation. This led to a concern with 'carrying capacity' and environmental degradation, led primarily by ecologists and environmentalists. Eventually, these concerns led to the emergence of the modern environmental movement in the 1960s, where the question of managing the 'population' was brought back into focus again through the work of Paul Ehrlich (1968/1988) and others.

By elaborating on this rather messy history of overpopulation arguments, I intend to trouble the self-evident nature of the argument as it is presented today, and instead show how it has been constructed and reconstructed in service of several different ideologies and political projects.

Malthus's Natural Law of Population

Malthus was a British political economist active at the start of the nineteenth century, publishing the first edition of his *Essay on the Principle of Population* in 1798. At the time, he worked as a curate

in Okewood Church, near present-day Gatwick airport, and collected his first statistical data from the church records in his parish (Hartmann, 2014, 757). Reverend Malthus's parishioners were mostly poor and illiterate labourers living in poor conditions, suffering from meagre diets and stunted growth, yet Malthus noted that baptisms outnumbered burials (758). Betsy Hartmann argues that this disparity – more births than deaths despite miserable living conditions – gave rise to Malthus's concern with population growth and led him to formulate his now famous principle of population. Malthus (1798, chap. VI) argued that if left unchecked, population will increase geometrically (1, 2, 4, 8, 16, 32), while subsistence, or food production, can only grow arithmetically (1, 2, 3, 4, 5, 6). Malthus formulated his principle of population in the form of a natural law – "if left unchecked," meaning in a state of nature – where the "natural inequality" between the two great powers of population and subsistence would inevitably lead to scarcity as humanity struggles to provide enough food for its growing population. In Malthus's own words:

> The race of plants, and the race of animals shrink under this great restrictive law. And the race of man cannot, by any efforts of reason, escape from it. Among plants and animals its effects are waste of seed, sickness, and premature death. Among mankind, misery and vice. (Malthus 1798, chap. I)

According to Malthus's principle, misery and vice were natural consequences of a population exceeding its means of subsistence. Misery and vice thus acted as "natural checks" on population growth in order to bring it down to subsistence level, and Malthus described them in quite apocalyptic terms:

> The power of population is so superior to the power in the earth to produce subsistence for man [sic], that premature death must in some shape or other visit the human race.

The vices of mankind are active and able ministers of depopulation. They are the precursors in the great army of destruction; and often finish the dreadful work themselves. But should they fail in this war of extermination, sickly seasons, epidemics, pestilence, and plague, advance in terrific array, and sweep off their thousands and ten thousands. Should success be still incomplete; gigantic inevitable famine stalks in the rear, and with one mighty blow, levels the population with the food of the world. (Malthus 1798, chap. III)

In Malthus's theory the availability of food and land would always be limited, and the threat of devastating consequences if the population size exceeded this limit was ever-present. With this pessimistic argument, Malthus went against progressive thinkers of his time such as the Marquis de Condorcet and William Godwin, whom he criticises extensively in the original 1798 edition of the *Essay on the Principle of Population.* It is important to note here that Malthus was writing in a time of great political upheaval in Europe, and his political ideas were likely a response to the political climate of the time. Kalpana Wilson (2012, 71-72) notes that Malthus's first book was published less than a decade after the French Revolution with its reconceptualisations of citizenship, statehood, and liberty, and in the middle of the Industrial Revolution which brought about large social and material changes. In Malthus's native England the shift toward agrarian capitalism through the Enclosure Acts (consolidating small landholdings into large farms and effectively removing access to the commons for the general populace) had led to displaced populations wandering the countryside looking for work, or moving to the rapidly growing cities (71). The era also saw a number of 'bread riots' during which rioters seized foodstuffs and sold them at prices considered more reasonable, following scarcity-induced price hikes (72). Indeed, one of the earliest and most significant events of the French Revolution, The Women's March on Versailles in 1789, started out as a protest against the high price of bread. Malthus was therefore writing in a time

characterised by anxieties over food scarcity and fears of a 'mob' of the growing working class (Wilson 2012, 72).

These turbulent times animated many philosophers of the time, but unlike progressive thinkers like the Marquis de Condorcet or William Godwin, who believed that human reason could bring about a just, peaceful and equitable world, Malthus took a different stance. He believed that they wrongly attributed vice and misery to human institutions, when in reality the problem lay in the laws of nature and the 'passions of mankind'. In response to Godwin's argument that a system of equality could be achieved through the efforts of human reason (by removing 'evil' or harmful political regulations), Malthus wrote:

> Were this really a true state of the case, it would not seem a hopeless task to remove evil completely from the world; and reason seems to be the proper and adequate instrument for effecting so great a purpose. But the truth is, that though human institutions appear to be the obvious and obtrusive causes of much mischief to mankind; yet, in reality, they are light and superficial, they are mere feathers that float on the surface, in comparison with those deeper seated causes of impurity that corrupt the springs, and render turbid the whole stream of human life. (Malthus 1798, chap. X)

Malthus concedes that *if* human misery was caused by ill-managed human institutions, reason would be the appropriate tool to remove this evil, but as it is not caused by human institutions, in his view, it made little sense to advocate for social change at the superficial level of society. The problem, for Malthus, was that the human drive for reproduction – the 'passions of mankind' – would always outstrip the rate of food production, and thus the 'natural checks' of misery and vice would always exist. Rational thinking and moral progress was not enough to change this 'natural

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law,' as Malthus saw it. He went on to argue that his principle of population and natural scarcity entirely disproved the possibility of a perfect society:

> I see no way by which man can escape from the weight of this law which pervades all animated nature. No fancied equality, no agrarian regulations in their utmost extent, could remove the pressure of it for even a century. (Malthus 1798, chap. I)

With this argument, Malthus naturalised the inequalities of his time. The Malthusian premise of limited resources meant that scarcity, precarity, and their subsequent miseries were 'natural phenomena' rather than an effect of economic exploitation or political subjugation. The suggestion that poverty and other miseries were an inevitable consequence of overpopulation provided "an enduring argument for the prevention of social and economic change" (Ross 1998, 6), as there was no need to question or reevaluate class divisions, colonialism, capitalist accumulation practices, or other human institutions when the source of the problem had been identified as population growth. For example, Malthus argued strongly against Britain's Poor Laws, a tax-funded program that gave some aid to the most destitute, as he believed they disrupted the 'natural checks' of disease and starvation that would alleviate the population pressure (Wilson 2012, 72).

So, what did Malthus believe could be done to control population growth? In spite of his pessimism regarding the possibility for a 'perfect' society, i.e. one without misery and vice, Malthus did distinguish between "positive checks" – the "naturally induced" miseries of war, poverty, famine and disease that occurred as a consequence of an *already increased* population (chap. V) – and "preventive checks" that limited fertility (chap. IV). However, on this point interpretations of Malthus vary. Historian Alison Bashford argues that Malthus's assessment of these 'checks' changed over the many editions of his *Essay*. While in the first edition he believed that the power of preventive checks were very low, and humans of the lower classes were doomed to the perpetual

suffering of positive checks, in the later versions (the sixth and final edition was published in 1826, almost three decades after the first) he admitted that the powers of population and subsistence could be balanced out somewhat by human interventions, primarily "moral restraint" (Bashford 2014, 31).[3] While population growth was always limited by natural scarcity, mankind could ameliorate the miseries of overpopulation through controlling its "passions." This is where Malthus does give some credit to the human capacity for reason, suggesting that among civilised humans, reason may interrupt the instinct to procreate if one does not have the means to support one's offspring (Malthus 1798, chap. II, IV). Feminist historian Carole McCann (2016, 26) interprets Malthus's text as a suggestion that people should apply market principles to calculate the cost of children and through reason break away from the 'natural instinct' to reproduce. McCann goes on to argue that "the subject of the principle of population is masculine. This figure embodied a specific, exemplary, bourgeois masculinity that tamed passion with reasoned self-discipline" (2016, 26). But if humans's capacity for reason could act as a control for overpopulation, this implies that those suffering miseries – primarily the poor – could be held responsible for their own suffering and were therefore undeserving of aid.

Kalpana Wilson offers a different reading of Malthus, where continued poverty was necessary in order to make people seek work, and therefore Malthus did not advocate for attempts to help poor people control their fertility (2012, 72). In this reading of Malthus, he attempted to "demonstrate that poverty was the result of the fecklessness of the poor themselves, and that capital should bear no responsibility for alleviating it" (72). Malthus's argument thus served as a go-ahead for further capitalist exploitation and colonial expansion, and any miseries that followed were the responsibility of the poor themselves, caused by their own immorality and irresponsibility of having too many children (74). This reading goes along with historian Thomas Robertson's claim that

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[3] It is important to note here that Malthus only believed in 'moral restraint', that is, delaying marriage and sex. Later interpreters of Malthus advocated for contraceptive practices other than celibacy, which might contribute to the strengthened power of preventive checks in later years (Bashford 2014, 31).

Malthus "saw poor people as almost a different kind of human being," regarding the poor boys in his parish as "a different race" from the students at Cambridge (2012, 4).

In Malthus's view, only the modern nations of Europe, and the newly independent United States, had achieved this capacity of preventive foresight, and among them, only the middle and upper classes (Malthus 1798, chap. IV; McCann 2016, 26). Malthus thereby linked the matter of population size to questions of morality and civilisation, and used the principle of population to judge the level of 'civilisation' in different countries around the world. This point is further illustrated in Malthus's account of the development of civilisations. He links spatial distance with temporal distance, placing the areas of the globe furthest from Europe as the least civilised, or primitive (McCann 2016, 28). McCann also notes that the arrangement of civilisations and peoples on a timeline is a way of creating a hierarchy, where colonising nations naturally place themselves on top as the most temporally advanced. In McCann's words:

> For Malthus this discourse of self-mastery calibrates masculinity and civilization by imperialist measures of sexual civility and crude death rates. In the aggregate, he reasoned, poverty, misery, and want resulted from the failure of men to maintain virtuous sexual habits and customs; thus mortality rates offered a particularly reliable marker of the level of moral restraint exercised in a population. Where morality was high, mortality would be low; where morality was low, mortality would be high. (McCann 2016, 30)

Malthus readily applied this idea that low mortality equals high morality to the European imperial project, making judgements of other countries in contrast to "European superiority" (McCann 2016, 28). It is here important to note that despite Malthus's apocalyptic warnings against overpopulation, he was not against population growth per se. In a society with low mortality, absent of misery and

vice, it was only natural that populations would increase, as sufficient access to room and food diminished the need for 'checks' on population. Indeed, Malthus argued that "there is no truer criterion of the happiness and innocence of a people, than the rapidity of their increase" (1798, chap. VI). Taking the British colonies in North America as an example – "now, the powerful People of the United States of America" (chap. VI) – Malthus praised their rapid population growth and used the American growth rate as the signifier of the 'natural' growth rate under ideal circumstances (chap. VI).[4] The rapid population increase in the United States indicated that they utilised their land well and were an overall moral society, unlike the Indigenous Americans who, in Malthus's view, must logically be immoral, having had access to all that land and yet not increased in population (chap. III, VI). Notably, he does not discuss the genocide that followed the European "discovery" of the Americas, so it is unclear how he would fit this massive loss of population into his theory.

To finish off the discussion of Malthus's proposed principle of population, it is important to note that Malthus's theory was not uncritically accepted in his own time. Fletcher et al. (2014, 1201) find that critics have tried to refute his theory since it was first published. Among these early critics was William Godwin, who Malthus criticises in the first edition and who claimed that Malthus's calculations of growth rates were inflated. Kathleen Tobin (2004, 1) notes that many critics pointed to technological advances in agriculture as proof that Malthus's prediction of an arithmetic growth rate was wrong, to which Malthusians replied that regardless of the rate of food production, the latter would always be spatially limited while population growth seemed limitless. To this, other critics replied that "supply did not pose a problem as much as distribution did," noting that the rich consumed a larger share of resources than the poor, accusing population theories of being classist (Tobin 2004, 6). Marx and Engels were also among Malthus's earliest critics, and Fletcher, Breitling and Puleo quote them saying that the overpopulation thesis was "the crudest,

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[4] Interestingly, Alison Bashford (2014, 33) tracks the original source of that number – the doubling of a population in 25 years – back to a 1751 pamphlet written by Benjamin Franklin, and while Malthus was initially unaware of its origin, the number became an important reference point for subsequent Malthusian thinkers, signifying the maximum growth rate in an ideal state.

most barbarous theory that ever existed, a system of despair" (Fletcher et al. 2014, 1201). But even if there was pushback and critique, Malthus's influence persisted and seemed to spread among everyday people, contributing to a commonsense linking of poverty and overpopulation.

Population Pressure and Colonial Expansion: "Where is the fresh land to turn up?"

In Malthus's discussion of population size, the matter of available land and resources became a crucial question, as the ideal population size had to be determined in relation to the available land, and the appropriate cultivation of that land. This transitioned the Malthusian argument quite smoothly into the colonial context, where acquiring new land and resources was a central concern. Both McCann (2016, 28) and Kalpana Wilson (2012, 73) also document Malthus's more direct participation in the British imperial project through his position as professor in political economy at the East India Company's College at Haileybury from 1805 until his death in 1834. There he educated the new generations of colonial officials and passed on his ideas about population, civilisation, and land use.

Malthus wrote in 1803 that "Man is necessarily confined in a room," and "[w]hen acre has been added to acre till all the fertile land is occupied, the yearly increase in food must depend upon the amelioration of the land already in possession" (Malthus quoted in Robertson 2012, 5). Even as the availability of land in America led to "the industry, happiness, and population of these states" (Malthus 1798, chap. XVII), they too must necessarily run out of land at some point, which threatened the decline of their society. In Malthus's words, "the spirit of benevolence, cherished and invigorated by plenty, is repressed by the chilling breath of want" and "the hateful passions that had vanished, reappear" (chap. X). This threatening future prompted Malthus to ask, mostly hypothetically: "Where is the fresh land to turn up?" (Malthus 1798, chap. X).[5] Malthus did not

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[5] Malthus did not seem to conceptualise America itself as "fresh land". Instead his discussion was theoretical, founded on the idea that the world would inevitably run out of land at some point in the future, which proved his model of an ever-present threat of overpopulation to be true.

conceptualise America itself as "fresh land." Instead his discussion was theoretical, founded on the idea that the world would inevitably run out of land at some point in the future, which proved his model of an ever-present threat of overpopulation to be true. However, while Malthus cautioned about the inevitable limits to growth – which earned him a reputation as a pessimist or "prophet of despair and gloom" (Robertson 2012, 6) – other Malthusian thinkers started surveilling the globe in search of such fresh land.

Anthropologist Georges de Lapouge wrote that "there was a superfluity of empty spaces on the globe" in Malthus's age (quoted in Bashford 2014, 133), and the claim that population increase in Europe was a driving factor behind colonial expansion and settlement was common at the time, framing colonisation as an attempt to secure "an outlet for surplus population" (Fletcher et al 2014, 1199). New World land was a necessary condition for the rapid population increase in the nineteenth century: "This was the literal ground from which populations doubled and economies thrived – in South America, the Pacific, and especially on the famous frontier of the North American continent" (Bashford 2014, 133). There were also attempts to calculate the total possible world population based on the availability of habitable land. One of the earliest attempts can be found in William Godwin's response to Malthus in the 1820s, where he calculated a maximum world population of 9 billion (Bashford 2014, 35). When he made his calculations, world population was only at around 1 billion, but Godwin arrived at this number by multiplying the population density in China, which he believed was the maximum, with the area of habitable land on the globe (Bashford 2014, 35). Determining the area of habitable land became a hot topic, then, and access to such land sparked intense political debate. Through these debates, Malthusianism came to be thoroughly integrated in the colonial project.

Bashford (2014, 36) notes that part of the process of colonisation was to make land occupied by indigenous people into "waste" land, officially unused land, to enable legal reoccupation under international law. For example, parts of Australia were colonised under *Imperial Waste Lands*

Occupation acts. Geographers mapped these "waste lands," creating a sort of canon list of land that was "empty" (even if people clearly lived there): Canada, Argentina, Siberia, Australia, parts of Africa (Bashford 2014, 134). Bashford argues that the scientific agendas of exploration at the time were thinly veiled occupation agendas (137). For example, British geographer E.G. Ravenstein's ostensibly scientific world survey, presented for the Royal Geographic Society in 1890, was titled "Lands of the Globe Still Available for European Settlement" (46). Increasingly extreme geographical zones were considered, in order to keep expanding a rapidly closing "frontier": sub-Arctic and Antarctic islands, deserts, and jungles. One explorer, Vilhjalmur Stefansson, published the book *The Friendly Arctic* in 1922, suggesting that Spitsbergen (the largest island in Svalbard, population 2.600 in 2012) might become "the new Pittsburgh of the Far North" (quoted in Bashford 2014, 137).

The interest in these explorers increased as the amount of "fresh land" in the world decreased. People were now coming up against the limits that Malthus had warned about all along. Thomas Robertson (2012, 5) notes that the United States in particular had a self-perception as a "People of Plenty," and felt threatened by the looming resource shortages. Malthusian fears had been weak in America until the 1890s, when the American frontier was perceived to close and concerns about population growth increased. But Americans did not succumb to Malthus's pessimism, and instead of focusing on preventive checks to population growth, they worked to expand their available land and resources. This included both technological solutions, like attempts to turn deserts into farmland through irrigation systems, as well as colonial expansion (6). Robertson writes: "Fearing a shortage of resources but displaying none of Malthus's concern about reliance on overseas sources, Americans also increasingly looked abroad for raw materials," writes Robertson (2012, 6), and notes that in the 1890s the United States expanded their international trade and took control of the Philippines, Cuba, and Puerto Rico. Colonial expansion was in this sense motivated by Malthusian

concerns over scarcity of room and food, but had abandoned Malthus's original pessimistic outlook by turning colonisation into a solution to the overpopulation problem.

Malthus would probably have answered that these optimistic Malthusians were living on borrowed time – at some point they would hit the absolute limit. However, in order to manage the available land, and perhaps postpone when this absolute limit would be reached, a legal argument was developed in the late nineteenth century wherein colonial occupation had to be justified in terms of "effective occupation" (Bashford 2014, 139). Originally, this argument had been used to support a *terra nullius* doctrine, that is, that land was free for the taking because the indigenous population had not claimed it as theirs. From this Malthusian standpoint, these lands were 'underutilised' and "ready to absorb some of the world's growing population" (138). Even when people lived there, as was evident in the case of Australia for example, people argued that if they were not properly using the land, then it should be available for repopulation by nations that were experiencing population pressure (138). Land claims were strengthened by proving 'effective occupation', which was judged by Western standards of maximising cultivation – thus disqualifying many indigenous peoples (134).

The population question thus started to merge with the question of sovereignty, of the right to land. While this was certainly a legal matter, it also had to be thought of in terms of a moral principle (Bashford 2014, 138-139). At the 1927 World Population Conference, explorer John Walter Gregory stated that "no nation has made the land it occupies, or has the right to prevent its adequate use" (138). Throughout the long nineteenth century, European countries had claimed land on the grounds that the indigenous people were not utilising the land effectively, but in the 1930s the European settlers' own claims to land began to be evaluated on the basis of their successful cultivation of said land (140). In an overpopulated world with insufficient resources, what right did settlers or European colonial empires have to reserve land that they did not use? Interestingly, Bashford finds that this argument manifested a strong strand of Malthusian anticolonialism, often

expressed alongside explicitly pacifist politics (10). It was a limited sort of anticolonialism though, which was rarely used to argue for indigenous peoples' right to their own land, but rather used to question settler-colonial nations' right of occupation. Many Malthusian thinkers argued that their land should be redistributed to nations with more pressing overpopulation concerns, who would better utilise the land. As for the pacifist aspect of this argument, Malthus's theory held that war was among the key miseries caused by overpopulation, and many Malthusians believed that redistribution of land according to need was one of the best strategies for peace. For example, demographer Warren Thompson suggested that France should give their unneeded territories to Germany and Italy, countries with a greater need for a population "safety valve," and such a gesture of goodwill might benefit France diplomatically (cited in Tobin 2004, 67). Bashford (2014, 142) further argues that another part of the problem was that those nations that had first expanded demographically – i.e. Europe – had also been the first to expand territorially, but now that other nations' populations were increasing, there was no more land to expand to. There was primarily a concern with Asian countries like Japan, with many Malthusians arguing in the interwar period that peaceful territorial redistribution of land to Japan might prevent a future war in the Pacific (Bashford 2014, 142).

Australia became a particular topic for discussion in this context. The fact that Australia was often cited as an "empty" continent or a "waste land" started to become a concern for the Australian government, who were claiming sovereignty over the whole of Australia's landmass without actually settling on all of it (Bashford 2014, 141). The international calls for population redistribution began to converge on Australia, putting into question its strict race-based immigration policy. For instance, Warren Thompson, an influential demographer and Malthusian, suggested that the ceding of the tropical parts of Australia to Japan and China would be a most sensible foreign policy (Bashford 2014, 148). Malthusian thinker Harold Wright said on the question:

The "White Australia" policy, by which a population considerably smaller than that of London claims the whole continent and excludes Asiatics not only from the districts now inhabited, but also from the tropical north where European settlement has not yet been successful, is a typical, if extreme, instance of attitude which the white man has adopted. (Wright quoted in Bashford 2014, 141)

As more and more people started questioning Australia's land claims, population became a question of national security, and "populate or perish" became official Australian policy (Bashford 2014, 149). Australia was not doubling its population quickly enough, and soon the discussion converged with another strand of thinking with Malthusian roots, namely eugenics. Perhaps the problem was that White Australians were not physiologically compatible with the continent, and it ought to be handed over to a more biologically suitable people, such as the Japanese? The question of the biological/physiological suitability of the "white man in the tropics" thus became a matter of national concern for Australia, and research boomed in order to prove white Australians' reproductive viability on the continent (148). Bashford writes: "Viable tropical physiological and reproductive functioning was shown to be quite possible, Australian scientists concluded, a little too insistently" (148). Despite this, Australia was still referred to as "Asia's Safety Valve" as late as 1965 (149).

Among other Malthusians, these concerns with "effective occupation" of land sparked an enduring internationalism and cosmopolitanism. Annie Besant, an early women's rights activist and one of the founders of the Malthusian League in England in the late nineteenth century, suggested the formation of a union that would "bind together every land in one great commonwealth … one vast Parliament where all should make their voices heard" (Besant quoted in Bashford 2014, 45). George Drysdale, another prominent Malthusian, dreamed of a "Federation of Mankind" and wrote that "it seems to me that one of the grandest aims ever conceived – indeed, next to the removal of

poverty and the other population evils, the very greatest reform that could be effected in human affairs – is to get rid gradually of the present system of independent sovereign states" (Drysdale quoted in Bashford 2014, 45). However, Bashford notes that in Drysdale's imagined Federation the so-called "less civilized races" had no place and would be "done away with" over time (45). Drysdale here referred to "improvement" or "assimilation" rather than genocide, but the fact remained that the dream of a 'Federation of Mankind' only allowed certain people in (45). Margaret Sanger, a well-known birth control activist, as well as Malthusian and eugenicist, also believed in this limited internationalist dream, writing that:

> After my eight months tour of the world, I am glad to agree with H.G. Wells when he says that the whole world at present is swarming with cramped, dreary, meaningless lives, lives which amount to nothing and which use up the resources and surplus energies of the world. (Sanger cited in Bashford 2014, 234).

Thus, while Sanger and her fellow internationalist or cosmopolitan Malthusians did not align themselves with national interests, preferring to work on the international scale, they were not free from racist sentiments. Once it had been established that there was a scarcity of land and thus a limit to population growth, the question soon followed of who exactly should live in that space – which humans ought to make up the world population? As Bashford puts it: "if population growth was to be reduced, the eugenic question was derivative" (242).

Before moving on to the question of eugenics, I will briefly summarise this section. During the nineteenth century, and partway into the twentieth century, Malthusian thinking developed alongside and as part of the consolidation of the colonial knowledge paradigm – as well as the geopolitical reality of colonial domination. During this period, Malthusianism diverged from Malthus's original argument in the sense that it abandoned Malthus's pessimism, and instead used

Malthusian argument to effect material changes. It was a more proactive Malthusianism, albeit focused more on the land-aspect of the equation than the population growth-aspect. Furthermore, Malthus's population argument generated three major ideologies/projects that were contradictory with each other: first, a population-based justification for traditional colonialism, second, a sort of limited anti-colonialism focused on contesting European land claims, and third, a form of internationalism or cosmopolitanism that quickly aligned itself with the project of eugenics. While they all departed from Malthus in different ways, they also inherited some key problematic assumptions that were inherent in Malthusian thinking from the start, such as the belief in absolute environmental limits, the differential valuation of societies based on growth rates and mortality rates, and the notion that poverty, war, and other miseries were 'natural' consequences of overpopulation.

Darwin's Natural Selection and the Malthusian Argument for Eugenics

Toward the end of the nineteenth century, questions of human difference became central to those working with population matters. This became especially clear in the newly developed discipline of eugenics. Bashford (2016, 240) argues that many – although not all – eugenicists were motivated by Malthusian concerns over growing populations, but unlike Malthus, they believed that through human intervention, they could manage human reproduction rates at both national and world scales. However, Bashford goes further than arguing that there was an overlap between the two ideas, and goes as far as to claim that Malthusianism must be understood "not in contrast to eugenics, or reducible to eugenics, but as *formative* of it" (240, emphasis added).

The invention of eugenics as a "discipline" comes from Francis Galton, cousin of Charles Darwin and an avid reader of both Darwin's and Malthus's work, who coined the term 'eugenics' in 1883 (Wilson 2012, 76). Bashford argues that although the "Malthusian idea that was at the heart of eugenic selection is not often recognized" (2014, 241), Malthusians and eugenicists shared an

intellectual common ground in Darwin's reading of Malthus. Malthus's core argument, according to which more organisms were produced than could be sustained by their environment, served as an intellectual link between political economy and natural history and sparked the imagination of later thinkers. In particular, the idea of a perpetual struggle for room and food, implying a spatial limitation to population growth, caught the interest of the two mid-nineteenth century founders of evolution, Darwin and Alfred Russel Wallace (Robertson 2012, 5). The Malthusian argument prompted them to think about the behaviour of organisms in limited spaces, which contributed to the development of the theory of evolution by natural selection, which they published separately but simultaneously in 1859. Francis Galton, and other eugenicists reading Malthus and Darwin together, came to the conclusion that Darwin's theory was a scientific validation of Malthus theory; verifying that "man was part of the order of nature, and, in regard to his organs and powers of reproduction, simply a superior animal" and thereby subject to the same natural laws as any other animal (Bashford 2014, 40). There was nothing special about the human – like the capacity for reason or morality, or "special creation" by God – that made it exempt from the principle of population (Bashford and Levine 2010, 4). Darwin thus provided 'biological proof' of Malthus's natural law of population.

Despite this positioning of the human as an 'animal' like any other, Galton also argued that the 'natural checks' on population that Malthus described – misery in the form of war, poverty, disease and starvation – were inhumane and a civilised and modern society ought to do better. "Natural Selection rests upon excessive production and wholesale destruction," Galton wrote in his memoirs (cited in Bashford 2014, 241) and offered human-directed selection – that is, eugenics – as the humanitarian alternative. Because Galton believed the "unfit" would die in misery anyway – many in infancy, as the high infant mortality rates showed – he argued that eugenics should focus on "bringing no more individuals into this world than can be properly cared for" (cited in Bashford 2014, 241). Eugenics thus became a cause for the progressives at the time. But it is important to

note that there has always been a distinction concerning *which* populations are growing too fast, targeting certain populations as 'problem populations.' This can be seen already in Malthus's (1798) original text, where he located the issue in 'less civilised' people, which for him included the poor and lower classes, as well as indigenous people abroad. Later neo-Malthusian eugenicists targeted the same populations much more explicitly, focusing on Third World populations as well as racialised, poor, and disabled people at home.

Given the neo-Malthusian concerns with population control from the early nineteenth century, Betsy Hartmann suggests that it is unsurprising that "[t]he first major public advocates of birth control were the English radical neo-Malthusians" (2016, np chap. 6). Joining in the struggle for the legitimisation of birth control were a number of actors with quite different goals and motivations: "The early neo-Malthusians supported birth control as a means of improving the condition of the poor by limiting population growth; feminists and socialists believed it was a fundamental woman's right; eugenicists embraced it as a way of influencing genetic quality" (chap. 6). Hartmann goes on to argue that this gave the birth control movement its unique character, containing both arguments for "birth control as a liberating force, as well as a means of coercive population control" (chap. 6). There was of course also overlap between these groups, as seen in the case of Annie Besant, neo-Malthusian and early women's rights activist during the latter part of the nineteenth century. Besant garnered international attention when she, along with Charles Bradlaugh, was put on trial in 1877 for publishing an 'obscene' pamphlet on contraceptive methods (Connelly 2008, 18). Bradlaugh and Besant rose to their own defence, and Besant attracted international attention through her passionate arguments for population control. Matthew Connelly describes Besant's argument as follows:

Citing Darwin and Galton, she described how interfering with nature without scientifically controlling it would lead to the proliferation of the physically, mentally,

and morally weakest members of humanity. It was a "crime" against society to bring

into the world children for whom one could not provide. (Connelly 2008, 19)[6]

These Victorian neo-Malthusian birth-control activists had disregarded Malthus's original stance that fertility should only be limited through moral restraint, and dared to suggest that perhaps people should be allowed to have sex without having children, thus necessitating the need for contraceptives (Hartmann 2016, chap. 6). However, as seen from Besant's argument, the Victorian neo-Malthusians and eugenicists were not only concerned with the quantity of children born, but also the quality.

Within the Malthusian paradigm of limited room and food, others' population growth threatened one's own, so the question of selection became important. Charles Vickery Drysdale, president of the Malthusian League and member of the British Eugenics Society until 1961, believed that "the reduction in the birthrate was a necessary precondition for successful eugenics" – first one must deal with the quantity of population, before the question of quality could be tackled (Bashford 2014, 242). For many prominent neo-Malthusians, such as Vickery Drysdale or George Knibbs, "neo-Malthusianism quite simply *was* eugenics" (243, emphasis in original). John Maynard Keynes, the well-known twentieth-century economist and member of the Malthusian League alongside Vickery Drysdale, Annie Besant, Margaret Sanger, and others, arrived at eugenics through his interest in Malthus and the economics of populations, rather than a prior racial prejudice (242). To the neo-Malthusians, eugenics seemed a natural consequence: if population growth should be reduced, which people's fertility should be restricted or encouraged? Questions of population quality naturally followed from questions of population quantity.

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[6] Curiously, Besant and Bradlaugh's (and indirectly Galton's) reliance on Darwin was not returned. Bradlaugh had asked Darwin to be a witness in their defence and was refused, as Darwin opposed artificial checks on population, believing, like Malthus, that it would threaten chastity and family values (Bashford 2014, 43).

Kathleen Tobin finds that the Malthusian eugenics view was expressed as a general "tendency to desire a high birth-rate and low death-rate within one's own State, and a low birth-rate and high death-rate in other States" (2004, 67). This did not always lend itself to a support of birth control, as in the case of Besant. Fletcher, Breitling and Puleo (2014, 1204) note that there were concerns about the ratios between native and imperial populations in the colonies, exacerbated by fears of "race suicide" that had been raised by President Teddy Roosevelt, among others. Roosevelt had condemned birth control in a 1905 speech "for fear of the annihilation of the white race" (Fletcher et al. 2014, 1204).

Eugenics as a field of study grew rapidly from the 1880s and reached its peak in the 1920s (Bashford and Levine 2010, 4). Believing in the power of 'rational man' to understand and control the world, many eugenicists thought a proper understanding of the mechanisms of heredity and statistical probability would enable the rational planning of human breeding in order to achieve an ideal population (McCann 2016). Indeed, McCann notes that the eugenicists answered Malthus's call for a more well-developed statistical science, developing "the full mathematical potential of statistical normalization for representing and analyzing social differences by class, race, and coloniality" (36). Galton himself "developed the basic statistical tools of correlation and regression to address qualitative questions of heredity" in the late nineteenth century (36). In practice, eugenics often aligned itself with the welfare state to promote the marriage and reproduction of individuals deemed 'fit', while attempting to curb the fertility of the 'unfit' (Bashford and Levine 2010, 5-6).

While eugenics was certainly a racist project that held white populations as superior contra the rest of the world, it is also important to note that many of the 'degenerates' and 'unfit' were viewed as 'internal threats' that would pollute the own race/nation. Kathleen Tobin cites one doctor writing in 1920:

Degeneracy is a relative term only, and it would be presumptuous on my part to attempt

the definition of it. However, I would include under the classification of degeneracy

certain forms of insanity, imbecility, feeblemindedness, idiocy, epilepsy, chronic

inebriates, habitual criminals, congenital deaf and dumb, and the sexual perverts. (cited

in Tobin 2004, 36)

The urban poor were a particular target of eugenicist research, following the same vein of thinking

as Malthus did in 1798, that poverty must be the fault of the poor. Now "scientific 'proofs' of

weakness and inferiority bolstered existing moral condemnation" (Bashford and Levine 2010, 6).

Conceptions of human difference became central to the biopolitics – and geopolitics – of

population in the century after Malthus first formulated the principle of population. However,

departing from Malthus's limited understanding of 'preventive checks' in the form of moral

restraint, these new Malthusians believed that via human-directed selection of the population, we

could escape from the oppressive weight of Malthus's law. This human difference was expressed in

terms of race, but also in terms of physical and mental ability and disability, ultimately designating

who was 'fit' or 'unfit' to make up the ideal population (Bashford 2014, 240). The most notorious

instance of eugenic policy in its most extreme, actively life-ending form, is what we now

understand as the Holocaust in Nazi Germany. When Nazism was defeated, many also believed that

eugenic ideology disappeared with it, but eugenics as a whole did not end with Hitler's defeat.

Instead, Bashford (2014, 263) suggests that this marks the change in focus for eugenics, where the

explicitly racist concern with genetic 'improvement' retreated in favour of a concern with

'improving' the population through changing economic and social conditions.

Racism without Races: Eugenics Going Underground into Economics and Development

After the Second World War many eugenic organisations and state institutions sought to distance themselves from the Nazi ideology in order to continue their work (Connelly 2008, 10; Wilson 2012, 81). Eugenicists rapidly incorporated their organisations into new and respectable causes: the growing discipline of demography and international population control (Fletcher et al. 2014, 1199, Wilson 2012, 81). Wilson notes that many eugenicists were very explicit about their plans to repackage eugenic ideas, quoting the British Eugenics Society in 1956:

> The society should pursue eugenic ends, by less obvious means, that is by a policy of crypto-eugenics. The Society's activities in crypto-eugenics should be pursued vigorously, and specifically that the Society should increase its monetary support to the Family Planning Association and the International Planned Parenthood Federation. (cited in Wilson 2012, 81)

The new discipline of demography had framed women's fertility as the key question of overpopulation, and related their findings of different fertility rates across different social groups and societies as a matter of class, intelligence, and other characteristics (Fletcher, Breitling and Puleo, 2014, 1199). They were concerned that the high fertility rates in developing countries posited a threat to the wealthier nations with lower fertility rates (Fletcher et al 2014, 1199). While it was no longer expressed explicitly in terms of racial concerns, as with the discourse of 'race suicide', Alison Bashford and Philippa Levine (2010, 7) argue that the presence of colonial empires ensured that racial concerns were always present. When attention turned to the so-called 'Third World' after the two world wars, it was conceptualised as a "globalized pauper class" requiring intervention. Jade Sasser (2014, 1244) further argues that colonial populations were reframed after demands for independence across the Global South – at first there were a range of policies in place to increase

the size of colonial labour forces, but after they achieved independence and were no longer useful, those population booms were recharacterised as threatening, in economic terms.[7]

Fletcher, Breitling and Puleo write that US President Lyndon B. Johnson cemented this economic concern with 'overpopulation' in a 1964 speech before the UN, where he argued that "each five dollars spent on population control was worth one hundred dollars invested in economic growth (at an estimated cost of five dollars per 'birth averted')" (2014, 1199). Population control thus became an integral part of international development policy. International development programmes were implemented with a focus on 'family planning,' aiming at getting families to lower their procreation. Betsy Hartmann (2014) argues that the reduction of fertility in 'poor countries' was a key part of U.S. foreign policy in the "heyday of population control, from the 1960s to the end of the Cold War" and became linked to the fight to 'contain' communism (762). USAID (The U.S. Agency for International Development) was a key actor, alongside private population organisations. "So urgent was the imperative to drive down birth rates that coercive practices became routine," writes Hartmann (762). These could include forced sterilisation or the use of high-risk contraceptives without informed consent, usually administered separate from primary health care. In this framework, Hartmann argues that "family planning became a weapon in the war on population growth" (762).

Interestingly, there was a paradoxical tension between overpopulation and development; while overpopulation was seen as a threat to development, development itself was seen as the main cause of overpopulation. It was the state's efforts to improve life, through improved healthcare, access to vaccines and antibiotics, improved sanitation and nutrition, that gave rise to the now life-threatening 'population explosion' (Fletcher et al 2014, 1204). In Barbara Duden's words, "Modernization

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[7] A further discussion could be had here about the conflation of race and poverty that occurred throughout these population and development discourses. See for instance McClintock (1995) on the racialisation of poverty, and Escobar (1995) on how the problematisation of poverty was used to constitute/invent the idea of development.

reduces the death rate long before it reduces the birth rate. As a result, development may increase GNP and at the same time reduce GNP per capita" (2019, 166).

Contributing to the shift in focus from genetics to the economy after the world wars was the work of biologists like Raymond Pearl and demographers like Warren Thompson, who challenged traditional eugenic views. Thompson – the same person who suggested land redistribution according to need – had originally been very supportive of active human selection, writing in 1915 that "if the population is increasing more rapidly than it can survive, then the questions about which we are particularly concerned are questions of selection" (cited in Bashford 2014, 245-46). But when he returned to his studies after the war, he became very critical of the inherent racial bias of his fellow scientists, suggesting that their belief in their own "inherent superiority" clouded their research (Bashford 2014, 246). Thompson believed that many geneticists' claim to knowledge was overinflated and argued that the study of human society was a matter for sociologists and economists, not natural scientists (Bashford 2014, 246). To this end, he started developing a theory of 'demographic transitions', which rejected racial explanations of population growth in favour of sociological factors (Robertson 2012, 67-68).

Michelle Murphy (2017, 36-38) explains that the demographic transition model held that all societies would go through four stages: Stage 1 is premodern with both high fertility and high mortality rates so that the population size stays the same; Stage 2 occurs with the introduction of modernisation, for example via colonisation or foreign aid, where death rates drop while fertility remains the same, resulting in a population boom (importantly, this becomes a threat to development as population growth outstrips economic production); in Stage 3 fertility rates also drop as a consequence of modernisation, industrialisation and overall increased wellbeing and education (i.e. when a nation becomes 'civilised' fertility rates will drop); and finally in Stage 4 society is fully modernised and both fertility and mortality rates are low, leading to a stable population size again. However, Murphy notes that "there are no data used to derive this graph; it is

instead an abstracted and highly simplified model of purported relationships that directs imaginations about the history and future of population" (37). The model was based on Europe's past and applied it to the future of recently decolonised nations, and is "still widely used in policy, even though its veracity is heatedly contested within academia" (36). Robertson notes that the demographic transition model in its original articulation had no need for population control programs as populations would 'naturally' even out with modernisation, but soon a sense of urgency pressed policy makers to speed up the process of this transition (2012, 68-69). Murphy (2017, 38) argues that the demographic transition model made women's fertility a variable that could be adjusted, and soon the causality became interchangeable; would modernisation drive down fertility, or would a reduced fertility drive modernisation? There was also concern with how large the population growth would be during the second stage, with many thinkers voicing fears of a human population irruption before populations stabilised in stage three and four (Robertson 2012, 77).

However, while the demographic transition model was developed as an attempt to disconnect population studies from racialising biology and instead make it a sociological and economic matter, the model was soon picked up by ecologists and brought back into the realm of the natural sciences. Ecology was conceptualised as "the economy of nature" and ecologists studied human society as an ecosystem (Bashford 2014, 158, 245). One of these ecological thinkers was Raymond Pearl, a biologist who studied population density in fruit flies and claimed to have found a "law" of population growth which applied to both humans and animals (Robertson 2012, 17). Pearl's so-called "logistical curve" followed an S-shape; first there was slow growth, followed by a period of rapid growth, before plateauing once maximum capacity was reached (Robertson 2012, 17). Murphy (2017, 11) finds that Pearl critiqued much of the racist assumptions of eugenic hereditary logic on the basis of being statistically and mathematically unsubstantiated, and argued that many of the projects attempting to govern population quality were scientifically unsound. However, Pearl was still a committed racist and eugenicist; he just moved his "racist accounts of differential human

evolution into an economic rather than hereditary biological register" (Murphy 2017, 11). Murphy argues that Pearl's work "created newly legitimated quantitative ways of assigning differential life worth after explicit claims to racial biological inferiority became scientifically illegitimate" (2017, 12). It was now possible to enact racist practices without explicitly talking about race. The eugenics movement thus successfully went underground after the war, and the movement for population control found new outlets in the emerging fields of demography and ecology, and eventually emerged as a central part of the new environmental movement of the mid- to late twentieth century.

Ecology and Degradation Narratives: How Population Became an Environmental Question

"Our problems would be much simpler if we needed only to consider the balance between food and population," wrote Paul Ehrlich in his bestseller *The Population Bomb* in 1968, "but in the long view the progressive deterioration of our environment may cause more death and misery than the food-population gap" (Ehrlich 1968/1988, 26). Ehrlich was part of the rapidly growing American environmental movement in the 1960s, a movement which historian Thomas Robertson argues was "unlike anything Americans had seen before" (2012, 2). It was different from the conservation movement of the 1890s and early 1900s, it was more comprehensive and broad-based than earlier environmental movements, but above all it was more pessimistic. There was also a growing concern with the "population problem" among environmentalists, in part fuelled by texts like Ehrlich's and other biologists – Garrett Hardin's (1968) essay "The Tragedy of the Commons" was published the same year. Ehrlich's *The Population Bomb* sold over 2 million copies, and Robertson (2012, 2) finds that Senator Gaylord Nelson, who initiated the first Earth Day, was among the followers of Ehrlich's theory. It was no coincidence, argues Robertson, that "the environmental movement crested at precisely the same time as concerns about overpopulation" (2). However, it was unusual that such Malthusian pessimism should take hold in the United States, which had previously resisted as concerns about population growth spread in Europe and other places in the world. In

order to explain how fears of population growth and resource shortage took hold in the U.S., Robertson argues that one must go back to the Malthusian thinkers in the interwar period, who laid the groundwork for the Malthusian environmentalists of the 1960s.

As I discussed above, fear of resource shortages and other limitations to growth first took hold in the U.S. in the 1890s, when the American frontier was perceived to close. However, this concern did not dominate the conservationist movement that emerged at the turn of the century, led by Theodore Roosevelt and U.S. Forest Service chief Gifford Pinchot (Robertson 2012, 2). The early conservationists had faith in technology, scientific expertise and planning, believing that they could maximise yields and saw critical resource shortages as a distant future problem (6). Robertson suggests that this view was best exemplified by the dream of "making the desert bloom" through the use of irrigation and other technological fixes and thus keep expanding the frontier indefinitely (6). Similar arguments were made on the global scale, with suggestions that the world's deserts or icy poles could be successfully populated. This view was increasingly challenged after World War I. One should keep in mind that for Malthusians, war was one of the miseries that followed when exceeding natural limits to population, and in Robertson's words, "nothing so dramatized the consequences of overpopulation" as war (14). The threat of renewed war was ever present for the Malthusian thinkers of this generation, as it would be for Malthusians in the late 1940s and early 1950s (14). Thus, in the interwar period, there emerged a new group of Malthusian thinkers that distinguished themselves from previous iterations of the overpopulation argument – namely the concern with the political-economic aspects of population growth, the ethnic and racial concerns of more traditional eugenics, and the women's rights-oriented concern with birth control. This group consisted of biologists, ecologists, and other scholars concerned with consumption, soil fertility, and environmental degradation (15). Robertson highlights the work of Raymond Pearl and Edward Murray East, who wrote about human populations, and Aldo Leopold, who wrote about wildlife populations (15). They pioneered the form of environmental Malthusianism that would grow

important in the latter half of the twentieth century, indeed laying the groundwork for the environmental Malthusianism we still see today.

Robertson suggests that the biologist Raymond Pearl was a key actor in developing the notion of *carrying capacity*, a concept that refers to the calculation of "the number of animals that a given landscape can support without deterioration" (2012, 18) and is still used today to argue for environmental limits – although Pearl never used that specific term himself. Pearl started out working with fruit flies enclosed in bottles, and then applied his notions of "closed universes" to other contexts (Robertson 2012, 18; Murphy 2017, 4). Like fruit flies in a bottle demonstrated growth and die-off in accordance to the available space, so human populations were regulated by the fixed limits set by "the volume and the surface of the planet on which we live" (Pearl cited in Robertson 2012, 18). Pearl presented his findings in the form of a "logistic curve," more commonly known as a growth curve or an S-curve, which plotted growth and die-off along a graph, and he claimed that this curve reflected a natural law of "how things grow" that was universally applicable (Murphy 2017, 2). Similar ideas of population density in limited space can be linked back to Charles Darwin: Malthus, using Benjamin Franklin's calculations, had given Darwin the "doubling population" number, and in return Darwin came up with the notion of "standing room only" – the idea that "the rapid multiplication without natural or human checks meant that 'there would literally not be standing room for his progeny'" (Bashford 2014, 49).[8] The phrase "standing room only" came to be used over and over again by population scholars to refer to hitting the limits of the Earth's carrying capacity, leading to statistician George Knibbs arguing in 1917 that "many times the current surface area of Earth – that is, many Earths – would be necessary for a population growing at the current rate" (Bashford 2014, 49). The idea of 'standing room' and 'many Earths' are echoed in today's environmental discussion, in the notions of a 'carbon footprint' and calculations of how many Earths it takes to support modern consumption patterns – i.e. carrying capacity. Pearl's

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[8] Bashford is citing from Darwin's *On the Origin of Species*.

work had further strengthened this notion that the planet was a closed system with a finite and, most importantly, *calculable* carrying capacity.

Edward Murray East went even further than Pearl with this notion, warning not only of the existence of limits, but of the idea of environmental degradation that would reduce carrying capacity in the long run (Robertson 2012, 20). East was a biologist and geneticist who became famous for his research on corn,[9] but his primary concern was with soil fertility (unlike other Malthusians' concern with women's fertility). He found that crops slowly drained the soil of important chemical foundations – nitrogen, phosphorus and potassium – and over-use of the land without replenishing these elements would lead to diminishing returns (21). East thereby anticipated the late-twentieth-century concerns with sustainable agriculture and debates about the use of industrial fertilisers.

Robertson (2012, 20) suggests that it was this notion of environmental degradation that set the environmental Malthusians apart from the rest. However, it is important to remember that both Pearl and East were also committed eugenicists. While they often criticised other eugenists for "bad science", they thought they could do better. Pearl was as concerned with the "quality" as with the "quantity" of the population, and East advocated for "rational birth control," immigration restriction, and racial segregation (21-22). Robertson also notes that East was sceptical about exporting health measures to poor countries, writing that the Rockefeller foundation had "'gone naively into China bringing her the blessings of Western medical art and sanitation' without thinking through how 'they are going to support the people they save'" (East cited in Robertson 2012, 22). However, while Pearl's and East's eugenicist and environmental projects were driven by the same Malthusian arguments, Robertson argues that "concerns about carrying capacity, limits, and environmental degradation were not identical to concerns about differential fertility and

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[9] Considering East's pessimism regarding food scarcity, Robertson notes with some irony that East's research on corn became the basis for the development of hybrid corn which later revolutionised agricultural food production (2012, 20).

weeding out the 'unfit'" (23). Pearl and East called attention to the fact that in order to measure and regulate the population-environment nexus, one had to focus on the 'environment' aspect as much as on the 'population' aspect.

However, while Pearl and East did important work in advancing notions of limits to growth and a calculable carrying capacity, the more well-known 'founding father' of the environmental movement was Aldo Leopold (Robertson 2012, 23). During the 1930s, Leopold began applying ecological ideas of consumption and carrying capacity back onto human society, writing in his 1933 textbook *Game Management*:

> Man thinks of himself as not subject to any density limit. Industrialism, imperialism, and that whole array of population behaviors associated with the "bigger and better" ideology are direct ramifications of the Mosaic injunction for the species to go to the limit of its potential, i.e., to go and replenish the earth. But slums, war, birth-controls, and depressions may be construed as ecological symptoms that our assumption about human density limits is unwarranted. (Leopold 1933/1986, 49)

Leopold was a conservationist, working for Gifford Pinchot's U.S. Forest Service for 15 years and then becoming a professor of game management in Wisconsin. He ended up developing an ecological framework that was at odds with most 1930s conservation (Robertson 2012, 23, 28). Conservation had until now been focused on increasing yields, cultivating those species deemed useful (by human standards) and eliminating those seen as injurious, rather than focusing on the health of the ecosystem overall (26). Leopold's new ecological model had consumption patterns at its centre and questioned the logic of continually increasing consumption. He illustrated this point in his most famous essay, "Thinking like a mountain," published as part of the book *A Sand Country Almanac* in 1949, where he recounted the story of the Kaibab plateau in Arizona. The

Kaibab had been under federal protection since the 1890s, and conservationists had removed predators in order to increase the yield of a desired species – in this case deer, for hunting purposes (Robertson 2012, 25). Leopold himself had killed many wolves as part of such federal programs. However, in the 1920s, the deer population spiked and then dramatically decreased. The wolf extirpation programs had massively misfired, causing a deer population explosion and then massive die-off from starvation:

> I have watched the face of many a newly wolfless mountain, and seen the south-facing slopes wrinkle with a maze of new deer trails. I have seen every edible bush and seedling browsed, first to anaemic desuetude, and then to death. … In the end the starved bones of the hoped-for deer herd, dead of its own too-much, bleach with the bones of the dead sage, or molder under the high-lined junipers. (Leopold 1949/1970, 139-140)

The story of the Kaibab became a "classic conservation horror story" for decades to come, and activists on Earth Day in 1970 still referenced it (Robertson 2012, 28-29). The notion of dying of "its own too-much" gained particular significance as a warning about humanity's future, and carried particular resonance right after the end of World War II. Leopold's theories also articulated the counterpoint to the new economic system that emerged in the 1930s and 1940s, driven by John Maynard Keynes's economic model of consumption-driven growth. Keynes had by now abandoned some of his earlier Malthusian concerns and advocated for policies that were more pro-population growth as a means of increasing consumption and thereby economic prosperity, leading to the development of the Keynesian economics he is most known for today (32). Keynes and Leopold thus came to represent two rival philosophies about consumption and economic growth, and many

environmental Malthusians, following Leopold, "reacted as much against this new obsession with growth as from concern about population per se" (30).

In November 1948, *Time* magazine wrote that "The ghost of a gloomy British clergyman, Thomas Robert Malthus, was on the rampage last week" (cited in Robertson 2012, 36). American Malthusianism had gained a wider audience in the late 1940s – the *Economist* likened it to the "virulence and high excitement of a fever" (cited in Robertson 2012, 36) – bolstered by two other bestselling books published in 1948: Fairfield Osborn's *Our Plundered Planet* and William Vogt's *Road to Survival.* Osborn and Vogt both expanded on the ecological thinking that Pearl, East, Leopold and others had initiated, and were heavily influenced by their experiences in World War II. Osborn spoke of man as a "geological force" that destroyed the earth "through unrestrained population growth and poor stewardship practices" (Sasser 2014, 1243). Vogt, an ornithologist studying the boom and bust of bird populations, believed that animal ecology could provide significant insights for human society, and applied for grants to study "the ecological laws that govern 'the living together of plants and animals on the earth' because, 'in a day when nations war for 'lebensraum,' such understanding is more than ever important'" (Robertson citing Vogt, 2012, 43). Both Osborn and Vogt believed that overpopulation and resource scarcity had been the real causes of both world wars and cautioned that the ignorance of ecological relationships and sustainability, as exemplified by economic practices like the Marshall plan, would inevitably bring more war (Robertson 2012, 37-38). Vogt used Leopold's story of the deer on the Kaibab to illustrate his point, likening Europe in the 1940s to the Kaibab during the 1920s:

> Had the deer of the Kaibab plateau been provided with guns and munitions, and a cerebral cortex to free them from the restraint of instinctive behavior and allow them to develop a master-race psychology, they might well have started a campaign of world conquest. (Vogt cited in Robertson 2012, 49)

Vogt argued that humans should study population irruptions among animals and take those lessons on board for the 'human animal'. Importantly, both Osborn and Vogt emphasised consumption patterns and the human place in a larger ecosystem. Their emphasis on overconsumption also centred their discussion in the American context, rather than locating the problem elsewhere in the 'Third World'. Osborn and Vogt thus continued the struggle against the economic growth doctrine that Aldo Leopold had begun. In Vogt's words:

When I write 'we' I do not mean the other fellow. I mean every person who reads a newspaper printed on pulp from vanishing forests, I mean every man and woman who eats a meal drawn from steadily shrinking lands. (Vogt cited in Robertson 2012, 11)

Robertson notes, however, that Vogt and Osborn somewhat differed in their critiques. Osborn believed that many problems could be solved through rational planning with businessmen and ecologists working together, while Vogt went so much further in his attacks on the capitalist system that "he made some observers uncomfortable during the McCarthyist days of the late 1940s and early 1950s" (51). Vogt also strongly advocated for population limitation programs and contraception, and in true Malthusian fashion, he questioned foreign aid and health programs. Robertson quotes him saying that the U.S. "should not ship food to keep alive ten million Indians and Chinese this year, so that fifty million may die five years hence," and asking if there was "any kindness in keeping people from dying of malaria so that they would die more slowly of starvation?" (cited in Robertson 2012, 53). He also worried about the environmental consequences of exporting the American consumerist lifestyle worldwide (Robertson 2012, 38).

Thus, Vogt anticipated the shift in the 1950s and 1960s from a concern with the genetic quality of human beings to a concern with "quality-of-life" (Robertson 2012, 65-66). However

problematic their views were, Vogt, and to some extent Osborn, came to the overpopulation discussion through a concern with consumption, not eugenic elitism (unlike many of their predecessors). Robertson argues that Vogt's views were "paternalistic but not racist" (2012, 54). This opened up Malthusian environmentalism to people with very different political views, including those driven by a self-interested defence of their own quality of life (as well as eugenic concerns) as well as those driven by altruistic interests in improved standards for all humanity. Robertson argues that it was the fear of overpopulation led Stewart Udall, Secretary of the Interior in both the Kennedy and Johnson administrations, to define the goal of postwar liberalism as improving the individual's quality of life: "It is obvious that the best qualities in man must atrophy in a standing-room-only environment. Therefore, if the fulfillment of the individual is our ultimate goal, we must soon determine the proper man-land ratio for our continent" (Udall cited in Robertson 2012, 83).

Even if the environmental Malthusians had first attempted to leave behind the matter of population in favour of a concern with the environment, they were unavoidably called back to the matter of regulating human beings. For instance, the intertwined concerns of women's fertility, ecology and environmentalism is exemplified in Planned Parenthood choosing William Vogt as national director in 1951-1961, distributing messages about scarcity and environmental degradation along with birth control (Robertson 2012, 72).

The Population Bomb of 1968: Human Populations as a Global Environmental Threat

If the concerns with overpopulation picked up speed in the 1950s and 1960s, they came to a head in 1968. The many social changes that America, and the world, had gone through in the past decades – including economic growth, urbanisation, global population growth, the Cold War, the Vietnam war, and a number of social movements like the civil rights movement, the women's movement, and a number of student protests – came to a boil in the late 1960s, and 1968 was a particularly intense

year. Paul Ehrlich wrote *The Population Bomb* in March and April 1968, attempting to explain the Vietnam war, the recent famines in India, as well as the escalating racial tensions and riots in the U.S. (Robertson 2012, 140). The very same day that Martin Luther King was assassinated, on April 4 1968, Ehrlich held a speech in Utah arguing that "the United States was an overpopulated nation in which 'riots tear cities apart'" (Robertson citing Ehrlich 2012, 140). While working on his manuscript, Ehrlich also experienced a number of riots across the country, a massive student sit-in at Stanford University where he worked, as well as having to decide, in the role of graduate director for Stanford's biology department, which students were eligible for deferment and which should be drafted to serve in the Vietnam war (Robertson 2012, 140). For Ehrlich, who had read Osborn and Vogt as a student, all of these issues came together in the same root cause – overpopulation – and he was determined to make population policy a major political issue. "It was the flawed genius of Malthusians like Paul Ehrlich," writes Robertson, "to bring together all of these problems, and propose solving them, that brought population growth such attention in the late 1960s" (2012, 224). Population biology became both a grand narrative and a neat solution, a "master key that could unlock the nation's most intractable problems" (Robertson 2012, 127).

In *The Population Bomb*, Ehrlich reiterated many familiar Malthusian arguments. He named "three of the four apocalyptic horsemen – war, pestilence and famine" as the "death rate solution" (Ehrlich 1968/1988, 45). Remember that Malthus's miseries were war, famine, disease and poverty. However, Ehrlich noted that:

Rapid improvement in public health, advances in agriculture, and improved transport systems have temporarily reduced the efficacy of pestilence and famine as population regulators. Improved technology has, on the other hand, greatly increased the potential of war as a population control device. Indeed, it has given us the means for self-extermination. (Ehrlich 1968/1988, 45)

War was a central theme in the book and lent a sense of urgency to Ehrlich's argument. However, what distinguished Ehrlich's argument from other Malthusians, who had repeated similar arguments, was the section called "A Dying Planet" where he elaborated on the human impact on the planet, with particular attention to soil erosion and pesticides. He also located the source of the problem firmly in human populations:

> The causal chain of the deterioration is easily followed to its source. Too many cars, too many factories, too much detergent, too much pesticide, multiplying contrails, inadequate sewage treatment plants, too little water, too much carbon dioxide – all can be traced easily to too many people. (Ehrlich 1968/1988, 44)

Ehrlich's book was also solution-oriented, ending the book with two chapters titled "What needs to be done" and "What can you do?" His strategy was a preventative one – even if it was possible to develop technological fixes for sustaining a growing world population, those would be environmentally costly, so would it not be better to reduce the need for those destructive technologies through curtailing population growth? Like Osborn and Vogt had done, Ehrlich brought the focus back to consumption and issued another critique of growth-focused economic practices:

> Up goes the population and up goes that magical figure, the Gross National Product (GNP). And, as anyone who takes a close look at the glut, waste, pollution, and ugliness of America today can testify, it is well-named-as *gross* a product as one could wish for. We have assumed the role of the robber barons of all time. We have decided that we are the chosen people to steal all we can get of our planet's gradually stored and limited

resources. To hell with future generations, and to hell with our fellow human beings today! We'll fly high now – hopefully they'll pay later. (Ehrlich 1968/1988, 140)

Robertson notes that this attention to consumerism had important political consequences. While still maintaining systemic drivers like capitalism in the centre of the analysis, it also brought environmental problems into the hands of individuals, not just governments: "It was a call for individuals to get involved. The personal was political" (Robertson 2012, 147). Ehrlich called for stronger population control policies both through access to contraceptives and abortions and through financial disincentives like taxes on children, cribs and diapers (Robertson 2012, 147). "It's not a baby, it's a Superconsumer!" Ehrlich exclaimed in the book (1968/1988, 140). Robertson notes that "Ehrlich remained vague about coercive measures in the United States," but mentions that he considered "placing chemical contraceptives in the water supply but decided it was not feasible" (2012, 147). However, outside the U.S. he was far more authoritarian, suggesting that population control should be the price of food aid in American foreign policy, including forced sterilisation programs. In Ehrlich's words:

I wish I could offer you some sugarcoated solutions, but I'm afraid the time for them is long gone. A cancer is an uncontrolled multiplication of cells; the population explosion is an uncontrolled multiplication of people. Treating only the symptoms of cancer may make the victim more comfortable at first, but eventually he dies – often horribly. A similar fate awaits a world with a population explosion if only the symptoms are treated. We must shift our efforts from treatment of the symptoms to the cutting out of the cancer. (Ehrlich 1968/1988, 152)

While Ehrlich's radical and decisive position earned him a rock star appeal for many young people (Robertson 2012, 162), his calls for strong action also led to strong critique. After all, as Robertson writes, "he is talking not of malignant cells but real people, whose only fault was the bad luck of being born in poor countries" (149). So, while population concerns practically exploded after Ehrlich's book was published – also driven by biologist Garrett Hardin's (1968) infamous essay "The Tragedy of the Commons", Pope Paul VI's controversial *Humanae Vitae*, a renewed push for birth control and abortion rights by the women's movement, and president Nixon speaking to Congress about the problem of population growth – the environmentalist Malthusians' support eroded just as quickly (Robertson 2012, 152). Garrett Hardin was among the strongest proponents of compulsory population control, arguing that "Freedom to breed will bring ruin to all" (1968, 1248). The emphasis on coercion by Hardin and his allies, which intensified in the early 1970s, led to a split with many women's groups that had previously been allied with the environmental Malthusians. They attacked the likes of Hardin for "believing that women's control of their own bodies should yield before the 'greater good' of protecting the environment" (Robertson 2012, 191).[10] Ehrlich's argument was extensively critiqued on the basis that its colour-blind universalism concealed cultural and racial difference, and many African American critics saw Malthusianism as "insensitive at best, and perhaps a disguised form of racial control" (173).

Ehrlich (1968/1988) often spoke of "Spaceship Earth," a metaphor meant to imply that 'we are all in this together', emphasising the interconnected ecosystem of global human populations. Robertson notes that it also highlighted the fragile nature of Earth's carrying capacity: "Whereas on an island, residents starve one by one, when the high-tech life support systems give out on a crowded spaceship, all passengers perish together" (2012, 150). While Ehrlich meant for this metaphor to illustrate universalism and equality between all humans, it also served to conceal

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[10] Robertson (2012, 191) notes with some irony that the rallying cry of these feminist groups – "abortion on demand" – had originally been coined by Garrett Hardin himself.

differences among the passengers of 'Spaceship Earth.' Interestingly, considering that Ehrlich is today known for radical and coercive population policies, he accepted this critique almost immediately and began changing his message by 1969, acknowledging that population planning to some extent was "a white racist plot" that unfairly targeted certain populations (cited in Robertson 2012, 173). He also updated the Spaceship metaphor, writing that:

> There is absolutely no way to live on a little spaceship with limited resources, with some people in steerage or third class, with the people in the first class cabins stealing food from the people in the third class cabins, waving large bombs at them, and expect them to sit still for it. (Ehrlich cited in Robertson 2012, 180)

By the late 1970s Ehrlich distanced himself from Garrett Hardin's most provocative article, "Living on a Lifeboat" from 1974, in which Hardin argued that rather than a spaceship, we were all living on lifeboats and should focus on keeping our own lifeboats afloat rather than helping others, even if that meant allowing people to drown. Ehrlich argued that a key part of the problem was that the 'rich lifeboats' took a too-large part of the economic pie for this metaphor to work, and besides it disregarded the "fundamental interdependence of nations" that made the spaceship metaphor work (Robertson 2012, 196). However, he still believed that problems of finite limits would ultimately overshadow concerns with unequal distribution of resources, and thus did not fully abandon his belief in the need for coercive population control measures (Robertson 2012, 196).

After incorporating (some of) the critique that his first book was race-blind, Ehrlich attempted to re-focus the population movement's attention on the consumption habits of the rich. This shift was further supported by the release of the Club of Rome's computer-aided calculations of economic and population growth in *The Limits to Growth* in 1972 (Robertson 2012, 180-181). However, Robertson notes that while this shift of focus may have addressed many of the legitimate

critiques, it ultimately undermined the wider appeal of the environmental movement, as it began to threaten middle-class American lifestyles and the dream of upward mobility through a growing economy (2012, 181). Besides, not all environmental Malthusians liked the new focus, and the movement split into concerns with consumption habits, concerns with family planning and birth control, and the newly emerging attention to immigration as an environmental threat. Disagreements from all sides led to the dissolution of the alliance between the many forces that had made the population question so powerful in the late 1960s. The association with coercive practices had also made Malthusian arguments suspect, and by the 1980s many groups had made an effort to distance themselves from Malthusianism (Robertson 2012, 227-228).

However, while Malthusian arguments were no longer as overt, the population debate shaped the development of many contemporary discourses – international development and the environmental debate are key examples – and many arguments which originated with Malthus can still be found today. The purpose of this chapter's genealogy of the overpopulation argument has been to destabilise its claims to be a neutral scientific concept. The idea that there are 'too many' humans has been put in service of several different projects, and often used as a tool to further that specific project's ideology – whether that is to support colonial expansion, to give credence to a racially-motivated concern with the 'quality' of the population, or to attempt to solve the climate crisis. Furthermore, the idea has been constituted within this racist and colonial knowledge system, and these underlying belief systems will influence all further iterations of the overpopulation argument, in spite of how much the new thinkers try to escape this legacy.

CHAPTER TWO

Human Populations in the Anthropocene: The Problem of the Universalised Western Man

Contemporary discussions of overpopulation often emerge alongside discussions of human-induced climate change, where human population growth is characterised as a contributing factor to problems like global warming, environmental degradation and resource scarcity. For example, the Intergovernmental Panel on Climate Change (IPCC) – the UN body responsible for assessing climate change science – stated in their 2014 Assessment Report 5 that "[g]lobally, economic and population growth continued to be the most important drivers of increases in CO_2 emissions from fossil fuel combustion" (IPCC 2014, 5). This association between climate change and the human is perhaps strongest in the notion of the Anthropocene – a term that was proposed at the start of the twenty-first century, and has since gained increasing traction, in order to distinguish the present geological epoch as one wherein humans are the primary geological actors. The word itself comes from a combination of *anthropos*, the Greek word for human, and *-cene* from *kainos*, meaning new, fresh, or recent. Thus, the basic understanding of the term would be the time period of the human. The Anthropocene narrative thus places the human species – human populations in aggregate – front and centre of the analysis, which allows for a reevaluation of the place of the human in relation to nature. However, as Diana Ojeda, Jade Sasser and Elisabeth Lunstrum (2020, 317) point out alongside other critics, the notion of Anthropocene also risks concealing intra-human difference and uneven responsibilities under the abstract notion of the Human. This can lead to a false equation between human numbers and the impact of (some) human activities, which undergirds an overpopulation narrative.

So, the question I pose in this chapter is whether the Anthropocene, or more specifically the notion of human-induced climate change, warrants new concerns about overpopulation? Is there something about this time period which makes it different from all the times fears of overpopulation have been raised in the past? Here I want to note that I am not questioning the reality of climate change, nor the fact, supported by a vast majority of scientists, that it is caused primarily by human activity (Ojeda, Sasser and Lunstrum 2020, 318). What I do want to question, however, is whether rising human numbers is actually at the root of this problem.

I begin this query by discussing Donna Haraway's argument that feminists must take up the question of "the burden of growing human numbers" (2016, 210). Haraway argues that "7-11 billion human beings make demands that cannot be borne without immense damage to human and nonhuman beings across the earth" (208), and given the urgency of these contemporary environmental problems, the matter of human numbers has become too important for feminists to leave it to thinkers on the Right (209). This turn in Haraway's argument has been extensively criticised by other feminists, a problem which Haraway anticipated and she therefore preemptively defends this choice, arguing that feminists must break away from some deeply held beliefs and commitments in order to be able to think clearly. Curiously, Haraway herself appears to have some trouble with this 'rethinking', as there is a constant conflict in her argument between the professed need to care about human numbers, and the argument that it is really not about humans per se, but rather about destructive processes of capitalism and imperialism. In order to unpack this conflict, I turn to the notions of the Anthropocene and the 'human' itself, as they are key components of Haraway's argument.

Analysing the notion of the Anthropocene shows it to be a narrative dependent on its origin story, of which there are several proposed options. These range from very early events like human mastery of fire or the invention of agriculture, to more recent historical events like the start of colonisation, the Industrial Revolution, or the invention of the atom bomb. The latter three are the

more generally preferred alternatives, and they all point to human *actions* rather than human existence as such, which challenges the narrative of human population growth as a driver of the Anthropocene. However, the very name 'Anthropocene' implicates the figure of the *anthropos* as the central actor, which contributes to the misconception that human presence as such is the core problem.

Therefore I turn in the final section to the question of who the *anthropos* is. Drawing primarily on Sylvia Wynter's analysis of the 'human' as praxis rather than noun, I argue that the *anthropos* has been imbued with the values and practices of Western Man, which have been universalised as if they reflected all human beings. From within the knowledge system which collapses the environmentally destructive *anthropos* with the human species itself, the proposal that we need to reduce the human population makes sense. However, it is precisely this narrative that I argue we must challenge in order to unsettle the overpopulation argument.

"**We cannot blame some other 'not us'**": Haraway's argument for reduced population size

Starting from the assumption that the present era of environmental crisis, whether we name it the Anthropocene or not, is human-induced, the question follows whether this fact warrants new concerns about overpopulation. Based on the overwhelming consensus among climate scientists of "the reality of human-induced climate change" (Chakrabarty 2009, 201), I see no reason to contest this claim. But does the recognition of humans as geological actors necessarily mean that there are "too many" humans? In their review of the field of feminist thinking about the Anthropocene, Paulla Ebron and Anna Tsing pose a similar question:

Has the Great Acceleration left us with more humans than the earth can bear? Feminist scholars have quite properly opposed racist population policies. But this commitment

has had the effect of closing discussion of the problem of too many humans. (Ebron and

Tsing 2017, 677)

Ebron and Tsing suggest that the problem of human-induced climate change may warrant a new feminist turn toward a concern with population size despite its troublesome history of racism, imperialism and eugenics. They draw particularly on Donna Haraway's book *Staying with the Trouble: Making Kin in the Cthulhucene*, where Haraway proposes a new slogan for this geological era: "Make kin, not babies!" (2016, 102). This argument has received sharp critique and some controversy – Haraway herself notes that she has been "screamed at after lectures" and "told that I can no longer call myself a feminist" (2018, 87). However, as Ebron and Tsing note:

Haraway has a long history of making brave moves – and winning feminism over. […]

This latest challenge to the field calls out to feminists: are we ready to address the

Anthropocene? (2017, 677)

The implication here seems to be that in order to address the Anthropocene, we must address the "problem of too many humans." Considering the long and troublesome history of the overpopulation argument, as well as the intense push-back Haraway has experienced, what is her argument for making this turn?

First off, Haraway establishes that there is "no question that anthropogenic processes have had planetary effects, in inter/intra-action with other processes and species, for as long as our species can be identified" (Haraway 2016, 99). However, she asks when these effects became so significant as to become a concern – after all, great terraforming events have occurred in the past, for example brought about by bacteria (in the Great Oxygenation Event) or by the spread of seed-dispersing plants long before the human species invented agriculture (99). What is it about this time

period that is so different from the rest that it warrants a new name? Haraway argues that it is not only the problem of climate change and global warming, but also the environmental burdens of toxic waste, pollution, mining, nuclear fallout, ecosystem simplification via monocultures, depletion of water systems, and the vast genocides/extinctions of people and other creatures (100). In total, these issues constitute the loss of "refugia", a term Haraway borrows from Anna Tsing, referencing the spaces of refuge within which species can be "reconstituted" after major destructive events (100). Tsing (2017, 53-54) suggests that what distinguishes the previous epoch, the Holocene, from the destructive Anthropocene is the disappearance of refugia in the latter; even as the spread of humans and the invention of agriculture inconvenienced many other species, they were able to recover and thrive in those spaces of refuge. In the present era, instead, nature's reserves have been "drained, burned, depleted, poisoned, exterminated, and otherwise exhausted" and refugia have been severely diminished, leading to the great extinction events of our time (Haraway 2016, 100). Haraway argues that this warrants a "big new name" (100), suggesting the Anthropocene, Plantationocene, or Capitalocene, referring to the sources of the current environmental problems.

Haraway also proposes a new concept, the Chthulucene, to refer to a different understanding of the world, which emphasises the entanglement, inter-species commitment and collaborative work and play of human, non-human and more-than-human terrans (101). The word Chthulucene is a compound of two Greek words: *kainos*, meaning new or fresh, a time of beginnings, and *khthôn*, meaning chthonic ones, beings of the earth, of the underworld (2). The Chthulucene is an alternative to thinking with the Anthropocene or the Capitalocene, a way of relating to one another that will lead us out of the problems of the present time period (55). It is therefore more of an ideal of the future than a diagnosis of the present system. Crucially, Haraway argues that:

One way to live and die well as mortal critters in the Chthulucene is to join forces to reconstitute refuges, to make possible partial and robust biological-cultural-political-

technological recuperation and recomposition, which must include mourning irreversible losses. (Haraway 2016, 101)

Here, Haraway proposes one prescriptive statement for being – in order to be a good creature of one's kind, one should act in accordance with the above statement and work to reconstitute refuges. She follows up this statement with the slogan "Make Kin Not Babies!" (102), suggesting that the way to do this in practice is via new kin-making practices and a reduction in birth rates. Haraway emphasises kin-making, the need to "become-with, compose-with" (102) other-than-human beings or chthonic ones, and the need to defamiliarise supposedly 'natural' biological family ties. She locates this work in the tradition of feminist movements for sexual and reproductive rights and freedoms, calling attention to the personal choice to have a child or not to have a child, and extending it to a discussion of non-human relations. Haraway attempts to expand the definition of 'kin' to mean something other than, or more than, ancestral or genetic connections, because, as she says, "all earthlings are kin in the deepest sense, and it is past time to practice better care of kinds-as-assemblages (not species one at a time)" (103). Ultimately this should also lead to a reduction in birth rates, with fewer human children and more unconventional kinships – here the second part of Haraway's slogan, "not babies," becomes relevant.

In setting up the premise of the Anthropocene and humans as terraformers, Haraway starts calling attention to the "trouble" of human numbers, suggesting that 7-11 billion human beings are simply too much for the planet to bear (102, 208). She addresses her decision to engage with overpopulation discourse in a lengthy footnote, arguing that despite the 'controversial' nature of population as a concept – mired as it is in imperialist, misogynist and racist discourses – feminists ought to reclaim the population discussion and can and should develop feminist frameworks to discuss population growth (208). She writes:

My experience is that those I hold dear as "our people," on the Left or whatever name we can still use without apoplexy, hear neo-imperialism, neoliberalism, misogyny, and racism (who can blame them?) in the "Not Babies" part of "Make Kin Not Babies." We imagine that the "Make Kin" part is easier and ethically and politically on firmer ground. […] My sense is that "our people" can be partially compared to some Christian climate-change deniers: beliefs and commitments are too deep to allow rethinking and refeeling. For our people to revisit what has been owned by the Right and by development professionals as the "population explosion" can feel like going over to the dark side. (Haraway 2016, 208)

Haraway notes that the overpopulation argument has often been used in tandem with imperialist, racist, misogynist and eugenic thinking, and "our people" (meaning those who resist imperialism, racism, misogyny) have therefore rightly opposed the argument. However, Haraway argues that this position is no longer viable, as the issues surrounding population growth are too important to "hand them over to the Right or to development professionals or to anybody else in the business-as-usual camps" (209). She also suggests that the reluctance to engage with population questions is akin to how some Christians deny climate change, because it comes too close to challenging the core of one's beliefs and commitments. What exactly are the core beliefs that are being challenged if we accept Haraway's argument that there are "too many" humans? One answer may be that Haraway asks us to accept "population" as a category to think with, to consider humanity as a universal in a way that seems counterintuitive to thinkers, including Haraway herself, who normally try to de-universalise such categories as 'the human'. Haraway writes:

I know "population" is a state-making category, the sort of "abstraction" and "discourse" that remake reality for everybody, but not for everybody's benefit. I also think that evidence of many kinds, epistemologically and affectively comparable to the varied evidence for rapid anthropogenic climate change, shows that 7–11 billion human beings make demands that cannot be borne without immense damage to human and nonhuman beings across the earth. This is not a simple causal affair; ecojustice has no allowable one-variable approach to the cascading exterminations, immiserations, and extinctions on today's earth. But blaming Capitalism, Imperialism, Neoliberalism, Modernization, or some other "not us" for ongoing destruction webbed with human numbers will not work either. (Haraway 2016, 208)

This is the core of Haraway's argument in "Make kin, not babies"; the notion that it is "us" who are responsible, hence "we" must reduce "our" numbers. Haraway recognises the difficulties in using abstracting and discursive concepts like population, but insists that the Anthropocene requires us to do so anyway. Thus, when Haraway says that core feminist beliefs and commitments keep us from "rethinking and refeeling" (208), she appears to be arguing that feminists should relinquish their critical focus on large-scale processes like capitalism and imperialism in favour of a focus on human numbers. However, the matter is more complex than that: in a previous chapter in the same book, Haraway herself argues that it is *not* Species Man, or the Anthropos, who is responsible for this environmentally destructive time period (47). There, she argues that the appropriate name for this era must be the Capitalocene, implying that our focus ought to be with processes like capitalism rather than with the Anthropos. She writes:

> The story of Species Man as the agent of the Anthropocene is an almost laughable rerun of the great phallic humanizing and modernizing Adventure, where man, made in the image of a vanished god, takes on superpowers in his secular-sacred ascent, only to end in tragic detumescence, once again. (Haraway 2016, 47)

Here Haraway writes that the Anthropos, or Species Man, is a constructed concept, a story caught up with the universal masculine conception of modern 'Man'. The view of humans as a planetary transformative geological agent is described as laughable. She turns against the narrative and mythos of the Anthropocene (49) as an artefact of the belief in "human exceptionalism" at every level (50). But then she argues that a "humanity with more earthly integrity" ought to welcome a limitation of our numbers as a way to create more freedom and quality of life for all (50). There is an inherent conflict in Haraway's argument, between the view of human numbers, in the universal, as a problem, and the desire to de-universalise too-big concepts like Species Man. She argues that humans alone are decisively not the cause of climate change, instead calling attention to the destructive systems and apparatuses of human institutions, and yet also claims that a reduction in human numbers is a crucial part of the solution to said problems. In order to unpack this conflict, there are two questions that need answering: what exactly is the Anthropocene, and who is the eponymous Anthropos? Put differently, who is the 'us', and can 'we' be held responsible for the environmental destruction of the current era?

The Anthropocene Narrative: Origin Stories

Let me start the discussion of the Anthropocene with one of Haraway's most well-known lines: "It matters which stories tell stories, which concepts think concepts" (2016, 101). The Anthropocene is one such story, or concept, that attempts to make sense of the world in a more or less clear narrative. The Anthropocene concept has been widely used since its inception, and while it started out as a

geological concept, its uses have expanded far beyond that field and it has since taken on political and philosophical meanings and narrative force. Environmental historian Jason Moore points out that the Anthropocene is a crisis narrative, and notes that "how we conceptualize the origins of a crisis has everything to do with how we choose to respond to that crisis" (2015, 176). Therefore, there is much at stake in the definition of the Anthropocene, what constitutes anthropogenic climate change, and when it started.

The term 'Anthropocene' was arguably coined by ecologist Eugene Stoermer in the early 1980s, but emerged in the global discussion in the year 2000 when Stoermer and the Nobel Prize-winning atmospheric chemist Paul Crutzen came together to argue that human activities had such an impact on the planet that it should constitute a new geologic epoch (Haraway 2016, 44). While many fears about human impact on the environment had been expressed earlier, such as in the environmental movement of the 1960s, the Anthropocene idea proposes that "the magnitude, variety and longevity of human-induced changes, including land surface transformation and changing the composition of the atmosphere" (Lewis and Maslin 2015, 171) constitutes a move from the previous Holocene epoch to a new Anthropocene epoch where the major geologic actor is the human species, the *anthropos*. The Anthropocene narrative thus places the human species – human populations in aggregate – front and centre of the analysis. Claire Colebrook argues that in this sense the Anthropocene signals the return of difference – "because humans are once again exceptional, but now in their destructive and inscriptive impact" (2017, 5). But at what point did it become inscriptive, asks Colebrook (2017, 5)? That is, at what point did human difference make a difference? There are a number of possible thresholds and starting points, from human 'mastery' of fire (Malm and Hornborg 2014, 63) to sedentary agriculture, or more recently, colonisation, the Industrial revolution, capitalism, or nuclear energy (Colebrook 2017, 5).

When discussing the possible start dates of the Anthropocene, it is important to note that the Anthropocene originally referred to geological time, as opposed to other kinds of historical time. It is not supposed to denote the mere presence of human beings, which is much older than any proposed start date of the Anthropocene, but rather the impact human beings have on geological strata. Geographers Simon Lewis and Mark Maslin (2015) explain that what matters when dividing up geological time is the global-scale impact on the planetary system, whether this is caused by a meteor crash, massive volcanic eruptions, the movements of continents, or the sum total of numerous human actions that change the environment on a global scale. Lewis and Maslin argue that human activity has clearly altered the planet enough so that the impacts will be "observable in the geological stratigraphic record for millions of years into the future" (2015, 171) and would thereby constitute a new geologic epoch. The proposal to recognise the Anthropocene as a distinct geological epoch was formally presented to the International Committee on Stratigraphy in 2008 and an Anthropocene Working Group has been established to consider the question, but no decision had been made yet (Luciano 2015).

Geological time scales are formally divided by a Global Boundary Stratosphere Section and Point (GSSP), more commonly known as a "Golden Spike"[11] (Yusoff 2018, 28). Lewis and Maslin (2015, 172) explain that the 'stratotype section' refers to the actual geological matter – the rock layer, sediment or glacier ice that develops over time – and the 'point' refers to where the marker is placed in that stratotype. This could be, for example, the existence of fossils that signal extinction events or the emergence of new species. There are specific criteria for what constitutes a GSSP, and if no sufficient material location exists, it is possible to agree on a date instead, called a GSSA (Global Standard Stratigraphic Age) (Lewis and Maslin 2015, 172). However, Kathryn Yusoff critiques attempts to present GSSPs as pragmatically and dispassionately chosen by a politically

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[11] So named after the literal golden spike (or disc) that is inserted in the rock layer at an appropriate location to demarcate the epochal shift.

neutral discipline of geology. Yusoff, referencing Dionne Brand, argues that all origins are arbitrary, and different foundational myths arise explaining how "we" got here depending on which origin is chosen (2018, 23) – also note that it is chosen, rather than 'discovered'. So although Golden Spikes refer to geological matter, they are not real places as such, but rather an indicator of or reference to an origin story or explanatory device (23-24).

The intense debates around the Anthropocene reflect the debate over what story to tell about human impact on the planet, and the start date reveals who is given agency – or blame – in the narrative. It has thus become an intensely political debate that extends beyond the field of geology. For example, Dana Luciano (2015) notes that the earliest possible start date is between six and eleven thousand years ago with the transition from hunter-gatherer society to settled agriculture, since the land-clearing required for agriculture changed both the atmosphere and the Earth's surface. However, Luciano argues that linking the Anthropocene to the agricultural revolution would rob the term of its political energy, as it is difficult to imagine undoing the change that caused the Anthropocene – "very few people are advocating a return to hunter-gatherer status" (Luciano 2015, np). Going even further back in time, Andreas Malm and Alf Hornborg (2014, 63) note that some theorists suggest that the metaphorical 'fuse' for the Anthropocene was lit when humans learned to use fire, starting a chain of events that lead to the Industrial revolution. However, Malm and Hornborg dismiss this hypothesis, arguing that attempts to "attribute climate change to the nature of the human species" are doomed to vacuity – transhistorical reasons, especially species-wide reasons, cannot be invoked to explain qualitatively novel and specific events in history (63). Likewise, Lewis and Maslin caution that such very early start dates may 'normalise' global environmental change as part of human existence, rather than signifying a later change in the human-environment relationship (2015, 171). Instead, the scientific community is debating three main proposals for a more recent start date based on both geological and political factors: 1610, 1800, or the mid-twentieth century (Yusoff 2018, 24).

A start date around the 1950s[12] links the Anthropocene origins to the detonation of nuclear bombs and the resulting nuclear radioisotopes that will be detectable in sediments from then on (Yusoff 2018, 44). That date also corresponds with the "Great Acceleration," referring to the increase in a number of physical, chemical, biological and human processes, including the increase in fossil fuel consumption, carbon dioxide emissions, development of new materials like plastics, and a major increase in human population (Yusoff 2018, 44, Lewis and Maslin 2015, 176). Mindful that the date chosen as the origin of the Anthropocene will affect the narrative of ongoing human development, Lewis and Maslin suggest that:

> Choosing the bomb spike tells a story of an elite-driven technological development that threatens planet-wide destruction. The long-term advancement of technology deployed to kill people, from spears to nuclear weapons, highlights the more general problem of 'progress traps' (Lewis and Maslin 2015, 177-178).

Thus, choosing the 1950s date would link the Anthropocene to a period of militarisation and technological achievements that threaten long-term livability. However, Lewis and Maslin (2015, 177) note that while nuclear explosions certainly have the capacity to radically transform the planet, they have not yet done so – many of the environmental concerns we face today, like global warming, are caused by an increase in carbon dioxide, not nuclear fallout, and while the Great Acceleration happened around the same time, there is no causal connection with the bomb. Yusoff also cautions that choosing the bomb spike, which is linked to the *event* of the atomic bomb and the technological achievement it signifies, risks obscuring the ongoing nature of the Anthropocene

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[12] Lewis and Maslin (2015) suggest the year 1964 specifically because of the recorded peak in radiocarbon that year, while Nicholas Mirzoeff (2018, 139) notes that the Anthropocene Working Group of the International Commission on Stratigraphy prefer the year 1945, when the U.S. military performed the first nuclear test at the Trinity site in New Mexico. Despite the different dates suggested, they refer to similar events, namely human 'mastery' over nuclear power.

(2018, 48). For example, she notes that discussions of the bomb event rarely mention the mining and disposal of nuclear materials, nor the designation of "sacrifice zones" for nuclear testing that often align with settler-colonialism and anti-blackness (48). Mirzoeff (2018) further argues that linking the Anthropocene to the atomic bomb gives certain human beings very deliberate power. The date comes to signify the moment when an elite minority became 'masters' of the Earth and gained power as geological actors: as director Oppenheimer phrased it at the Trinity site, "I am become Death, the destroyer of worlds" (Mirzoeff 2018, 141). It is difficult to see how the origin story of the bomb spike would justify a name like the Anthropocene which implicates the human species in aggregate, when such a small subset of human beings are involved.

Instead, the most commonly proposed starting point for the Anthropocene, and the one originally proposed by Paul Crutzen, is the Industrial Revolution of the 1800s (Yusoff 2018, 39). In this narrative, the Anthropocene finds its origins in capitalist modes of production, capitalist labour forms and technological innovations (Yusoff 2018, 39). It would also assign agency and responsibility to a few specific European countries that pioneered this change. While this story may be compelling, and would strongly link the Anthropocene to the current issue of global warming, Lewis and Maslin note that it is difficult to determine an exact start date since the Industrial Revolution could be argued to start anytime between 1760 and 1880 (2015, 176). Paul Crutzen proposed the year 1784, when James Watt patented the steam engine (Mirzoeff 2018, 137) but Lewis and Maslin protest that while the steam engine was significant for further development, it was hardly a global stratigraphic event (2015, 173). In fact, Lewis and Maslin argue that there is very little evidence of this change visible in ice cores until at least the nineteenth century, and even so that increase is very gradual – there is no clear mark in the rock where to place the 'golden spike' (2015, 176). Choosing a date related to the Industrial Revolution would thus be based on historical events rather than geological evidence, which may threaten the perceived impartiality of a geological marker.

As Mirzoeff puts it, "[w]hatever the Anthropocene may be, it is not now being defined by the observation of data but by interpretation, the traditional task of the humanist" (2018, 140). And things immediately become more complex when trying to isolate causal events in human history rather than in the rock layers. Rather than locating the origin in the invention of the steam engine (a notably individualistic and technophilic achievement), one could argue that it was colonialism and slavery that constituted the conditions of possibility for the Industrial Revolution. Indeed, Yusoff argues that the wealth and material accumulations generated by colonialism and the slave trade contributed to the material preconditions for the Industrial Revolution (2018, 41-42), which would make this starting point just as valid as the invention of the steam engine. Yusoff also tries to shift attention away from technological invention to a shift in the conceptualisation of human beings as capitalist commodities:

> The new modes of material accumulation and production in the Industrial Revolution
> are relational to and dependent on their *pre*-productive forms in slavery and its
> organization of human property as extractable energy properties (Yusoff 2018, 40).

In this perspective, racism and colonialism are inherent in the construction of Europe and its processes of industrialisation and capitalism. Furthermore, the construction of humans (and other beings) as energy property was a condition of possibility for the capitalist system. Yusoff calls attention to the question of how matter is understood and organised, arguing that capitalism's extractive processes depend on some matter being constructed as extractable resources – and this objectifying process started primarily with colonisation and slavery (66-67).

Therefore, a third proposed start date for the Anthropocene would link it more explicitly to colonial expansion and the slave trade. Again, the specific date is still up for debate. It could be argued to be 1452, when African enslaved people were put to work on the first plantations in the

Portuguese colony of Madeira, thus giving rise to the plantation system and its subsequent relocation of people and ecologies on a global scale (Yusoff 2018, 33). Sylvia Wynter's preferred start date for this 'New World' is 1492, linking it to the 'discovery' or invasion of the Americas (Wynter 1995, Wynter and McKittrick 2015). Lewis and Maslin (2015) propose the year 1610, when the stratigraphic effects of the colonial expansion to the Americas can first be seen. The material marker of this date is the "Orbis spike", a decline in atmospheric CO_2 levels that can be observed in Antarctic ice cores, which was caused by a massive decline in human numbers in the Americas following the arrival of Europeans (Lewis and Maslin 2015, 176). The genocide of the indigenous population led to a decline from 54 million people in 1492 to around 6 million in 1650, and the reduction in farming that followed caused a regeneration of forests which sequestered enough carbon for it to be readable in ice cores today (Yusoff 2018, 29-32, Lewis and Maslin 2015, 176). Lewis and Maslin also note that the colonisation of the Americas led to a transoceanic movement of species – known as the Columbian exchange – which is undeniably a human-made change to the Earth system that can be seen in fossil deposits (2015, 177). Choosing the Orbis Spike as the start date for the Anthropocene would imply that colonialism, global conquest and commodification brought about the Anthropocene, highlighting social concerns and unequal power relationships while downplaying narratives of technophilic success and humans as "masters" of the Earth.

How we conceptualise the origins of the Anthropocene shapes how we respond to it. Is the Anthropocene a story of humanity achieving geological mastery and needing to become better 'stewards' of the Earth with this newly acquired power? Or is it a story of an unsustainable world system that has, deliberately or not, plunged the world into an ecological crisis that needs to be fixed – and if so, what exactly is the problem that needs fixing? These questions and the debate around an appropriate start date show the complex relationship between geological thinking and the social sciences. Should the date be chosen based on a clear line in the earth (which may be

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impossible to specify to such an exact year), or should it be chosen based on the historical events that historians, rather than geologists, have identified as the start of processes that led to later geological changes? Dipesh Chakrabarty notes that when trying to define the climate change crisis historically, we must bring together intellectual formations that are normally incongruous with each other: "the planetary and the global; deep and recorded histories; species thinking and critiques of capital" (2009, 213). How do we hold both registers in mind at the same time? For all the attempts to present the Anthropocene as an impartial scientific concept, defining the concept and historicising the phenomenon are intensely complex and political choices, not only because of the difficulty in identifying a start date but because of the political implications of those choices.

For all that the Anthropocene means the 'age of humans', it appears to have less to do with human existence and more to do with human activities. Notably, the proposed start dates generally have little to do with the problem of human population numbers. So, returning to the central question of this chapter: does the Anthropocene warrant a renewed concern with overpopulation? The mid-1950s date does refer to the "Great Acceleration", which includes the increase in human populations, but it is geologically defined by the existence of nuclear radioisotopes, not human numbers. Furthermore, Andreas Malm and Alf Hornborg (2014, 65) show that while there is indeed a correlation between population growth and an increase in CO_2 emissions, CO_2 emissions increased by a factor of 654.8 between 1820 and 2010 while population only increased by a factor of 6.6 in that time. They argue that these statistics imply that something other than population growth drove the expansion of the fossil economy, and furthermore, recent figures show that emissions grew fastest where population grew slowest, and vice versa. They conclude that "if a correlation is negative, causation is out of the question" (Malm and Hornborg 2014, 65). The 1800s start date addresses the rise of modern industry and coal power, and says little about human population size. The 1610 date does explicitly address human populations, but is defined by the

massive genocide of the indigenous populations in the Americas, hence by a matter of violent and dramatic reduction of population numbers rather than a dangerous increase. Nevertheless, while the origin stories of the Anthropocene repeatedly suggest that the shift into a new geological era originated from the actions of a smaller group of people, or as a result of systemic processes (which also originated primarily in Europe), the name Anthropocene itself brings back the anthropos as the central actor and elevates the human species into a collective actor. For this reason, many thinkers have suggested alternative names for this time period. Jason Moore (2015) – and at times also Haraway (2016) – advocates for the now widely popular Capitalocene, which calls attention to capitalist and imperialist processes over the abstract universal of the 'human species'. Haraway has also suggested the term Plantationocene to call attention to the role of the plantation economy and multiple forms of "exploited, alienated and usually spatially transported labor" (2015, 162). Finally, Mirzoeff (2018) suggests a term that calls into question the identity of the anthropos: the white supremacy scene. Mirzoeff argues that "whether the Anthropocene was the result of intentional, if misguided, world shaping by Euro-Americans or the consequence of colonial and imperial ambition" (125), it is part of a history of white supremacy and needs to be recognised as such – particularly since humans are now claimed to be "masters" of the Earth, a term that is loaded with a history of racism and slavery. Mirzoeff's intervention leads to the next central question of this chapter: who is the anthropos exactly?

The Problem of the Universal Human: Who is the *anthropos* of the Anthropocene?

In the Anthropocene narrative, humanity is constructed as a "collective" actor. This makes for an easy story, where the collective, universal Humanity is pitted against Nature while intra-human differences and inequalities recede from view. This is often expressed in the form of species-thinking, normally connected to the project of deep history rather than recent recorded history (Chakrabarty 2009, 213). Chakrabarty notes that the word *species* "will never occur in any standard

history or political-economic analysis of globalization by scholars on the Left" (213) because they are understandably concerned with the specific, material conditions of *humans*. However, the Anthropocene's attention to the scale of human impact tends to bring species-thinking back. As Claire Colebrook puts it:

> The policy implications of the Anthropocene have tended to suspend the typically feminist questions of this "we" that we seek to maintain and has instead led to the return to supposed species solidarity. (Colebrook 2017, 11)

Colebrook argues that feminists have typically questioned universalistic narratives, always asking who this "we" is, but in the Anthropocene these questions are often dropped in favour of a species-narrative. Indeed, this can be seen in my previous discussion of Haraway's argument, where she recognises that concepts like "population" risk erasing intra-human differences but still insists that "we" as the human species are too many. And yet, the debate surrounding the origin stories of the Anthropocene – including Haraway's (2016, 47) argument that we ought to call the current epoch the Capitalocene – suggest that the latter was not caused by the human species as such, but rather by specific events or behaviours perpetrated by particular groups of human beings. How did European Man, imperial man, industrial man, capitalist and consumerist man, come to stand in for the human species as a whole?

Sylvia Wynter proposes that this is the crucial problem/misconception we have to face in the discussion of climate change: the idea that "the *referent-we* – whose normal behaviors are destroying the habitability of our planet – is that of *the human population as a whole*" (Wynter and McKittrick 2015, 24, emphasis in original). In Wynter's view, there is no universal humanity, only an ideal of Man which over-represents itself as the human itself (Wynter and McKittrick 2015, Wynter 2003). Wynter therefore performs a re-historicisation of the notion of the human,

challenging the dominant narrative of the development of the human species and attempting to unmask humanness as *praxis* rather than noun. The *anthropos* would thus be better understood as a specific mode of *doing* human, rather than as a collective representation of the human species.

To make this argument, Wynter traces the "descriptive statement" of the human: the master code that governs what it means "to be a good man or woman of one's kind" (Davis cited in Wynter 2003, 271). The question of who/what 'we' are as human is, in Wynter's view, context-specific, consisting of a set of 'truths-for' that determine what it means to exist "as such a society, as such people, as such a mode of being human" (Wynter 2003, 271). Wynter's argument is aligned with other decolonial thinkers like Aníbal Quijano (2010), whose notion of the "coloniality of power" likewise holds that while one system of knowledge – or one descriptive statement of the human – is dominant, other modes of being are nearly unthinkable. Moreover, the construction and implementation of this descriptive statement is not a conscious process, and this contributes to its perception as a 'natural truth'. Wynter writes:

> [A]s human beings who live in society, and who must also produce society in order to live, we have hitherto always done so by producing, at the same time, the mechanisms by means of which we have been able to invert cause and effect, allowing us to repress the recognition of our collective production of our modes of social reality (and with it, the Argument proposes, the recognition also of the self-inscribed, auto-instituted nature of our genres/modes of being human). (Wynter 2003, 273)

Wynter thereby argues that the descriptive statement of the human is auto-instituted – there is no objective truth of what it means to be human, but rather that meaning is self-inscribed. She goes on to argue that the 'authorship' of the descriptive statement is then ascribed to – and thus legitimated by – an extrahuman agency. Where Wynter's genealogy of the human starts off, in the late Middle

Ages, this extrahuman agency, which was framed as having the power to define the human, was the supernatural or celestial, i.e. the Christian God (Wynter 1995, Wynter 2003). The theocentric, "sinful by nature," description of the human supernaturally legitimated the Church and the clergy's power over both people and knowledge production in premodern Europe (Wynter 2003, 263). However, around the fourteenth/fifteenth century, the descriptive statement of the human started to shift. Wynter links this shift both to the Renaissance (Wynter 2003) and to the '1492 event', when Columbus arrived in the so-called 'New World' (Wynter 1995). Wynter argues that before the New World could be 'discovered,' its "existence had to be made conceptualizable, for Latin-Christian Europe and its mode of subjective understanding then" (1995, 24). The humanist idea that God created the universe *propter nos homines,* for our human sake" (as opposed to the previous notion of a God who created the world, and contingently humans, for His Own Glory) enabled the "discovery" of the Americas because, if the world was made for our human sake by a master craftsman, it followed that the universe had to be knowable (Wynter 2003, 275, 278). This, Wynter argues, was the intellectual revolution of humanism wherein the mode of being human was "degodded" or secularised (1995, 25).

Thus, after the theocentric, Latin-Christian mode of human came the Rational Man, or what Wynter calls Man1, whose extrahuman legitimising agency were the natural/physical sciences. As Christian Europe was reconstituting itself as a "secular imperial entity, the West" (Wynter 2003, 300), the 'divinely created' difference between rational humans and irrational animals had to be mapped in terms of natural science. The question of race became central to the descriptive statement of Man1 from its very origin, as the Western Rational Man was defined through its relationship to a continuum of new categories of humans, hierarchically ranked based on rationality (288). Colonialism was therefore also an important factor in the development of this new mode of being human, as it introduced European Man to its human Others. This rational/irrational organising

principle was eventually expressed in the idea of the Chain of Being, a supposedly natural hierarchy of life forms wherein the West placed itself at the apex, while Black people were placed at the nadir of humanity, later reconfigured as the "missing link" between human and animal (300-301). Wynter also calls attention to another key change that followed this redescription of the human, namely the fact that the "behaviour-motivating 'plan of salvation'" (i.e. how to be a good human of one's kind) shifted from a desire for spiritual perfection to a desire for rationality:

> Seeing that because the "ill" or "threat" was now that of finding oneself enslaved to one's passions, to the particularistic desires of one's human nature, salvation/redemption could only be found by the subject able to subdue his private interests in order to adhere to the laws of the politically absolute state, and thereby to the "common good." (Wynter 2003, 288-89).

While non-White peoples were automatically placed at a lower rank of humanness, anyone could slip down if they did not behave rationally – being human thus became about behaviour, or praxis. Wynter notes that this descriptive statement of the human lasted until about the eighteenth century.

Significantly for this thesis, some of these 'truths-for'[13] can be found in Thomas Malthus's first theories of overpopulation, originally published in 1798. Malthus's principle of population is dependent on the notion that most humans are incapable of controlling their passions, thus leading to uncontrolled population growth. For example, in a passage that reflects the above quote by Wynter, Malthus states: "Urged by the passion of love, men have been driven into acts highly prejudicial to the general interests of society" (Malthus 1798, chap. XI). Malthus also believed that certain people, namely the European bourgeoisie, were 'civilised' enough to control their passions

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[13] Wynter (2003) uses the term 'truth-for' to refer to knowledges within a specific episteme, i.e. it is true within the present descriptive statement.

through rational thinking and thereby limit their procreation (1798, chap. II). It is also notable that Malthus describes those who could not control their 'baser urges' (the "savages" of the colonies, as well as the British poor) as almost subhuman. As historian Thomas Robertson puts it: "Malthus saw poor people as almost a different *kind* of human being" (2012, 4, emphasis added).

Wynter herself ascribes to Malthus a significant role in the rewriting of the descriptive statement of the human that occurred in the eighteenth century. In this second redescription, the "still hybridly religio-secular" figure of Man1 was redefined as the bio-economic Man2 (Wynter 2003, 314). This human was defined primarily by the biological sciences via Darwin's theory of evolution, which demolished the argument of divine design and instead viewed human difference as biologically/evolutionarily determined (Wynter 1995, 38-39). The human Other was no longer defined by irrationality, but by degrees of evolutionary selectedness/dysselectedness. As I discussed in the first chapter, Darwin's theory of natural selection was based on the Malthusian postulate of natural scarcity: unlimited population growth struggling against limited room and food led to the so-called 'survival of the fittest' (Wilson 2012, 76). The descriptive statement of the human thereby came to be based on the concept of the 'fittest' in Darwinian-Malthusian terms: namely the human who could best handle the "threat" or "significant ill" of natural scarcity (Wynter 2003, 320). Malthus hinted at this perspective early on, suggesting that by applying market principles to calculate the cost of children, humankind could break away from nature's grip on it – thereby becoming more civilised, or in other words more developed (1798, chap. IV). Wynter writes:

[I]n the terms of their new behavior programming schema, in whose "dysselected by Evolution until proven otherwise" criterion (i.e., guilty until proven innocent) the individual could not know if s/he had indeed been so selected except by attaining to the optimal status of being a middle class Breadwinner and/or successful Entrepreneur/

Investor, to not be middle class was/is to have to accept one's ostensible dysselection.

(Wynter 2003, 324)

In this descriptive statement of the human there is an overlap or conflation of underdevelopment in economic terms and underdevelopment in evolutionary terms: to be evolutionarily selected means to be able to master natural scarcity in economic terms, and being economically developed confirms your evolutionary status. The human Other in this schema is the jobless, the homeless, the poor, the "underdeveloped" – in short, the "economically damnés" (Wynter 2003, 321). Wynter also notes that within this new schema, the already inferior status of Black and Indigenous peoples was further "verified" by their lower socioeconomic status (326-27). Via this Malthusian-Darwinian descriptive statement of the human, material consumption and accumulation on capitalist terms became central criteria for being a good human of one's kind, and Wynter argues that it is this descriptive statement of the human that still dominates today.

In the 2015 book *On Being Human as Praxis*, Wynter applies this analysis of the human to the question of climate change. While she does not engage with the concept of the Anthropocene as such, she addresses the argument that global warming is caused by human activities, and that this started around 1750 with the Industrial Revolution but accelerated around 1950 (Wynter and McKittrick 2015, 20). Wynter turns to the question of origin stories and asks what happened in 1950 to cause this acceleration, and finds that by 1950 a majority of the world's colonised peoples became independent. These freshly independent peoples were then neocolonially reincorporated into the West's hegemonic world system, including the Western descriptive statement of the human as the "naturally selected (eugenic) master of Malthusian natural scarcity" (37). In this narrative, the reason for non-Western peoples' subjugation was not imperialism or economic and cultural subjugation, but rather that they were *underdeveloped*, and by following the hegemonic script for how to *do humanness* in the image of bio-economic Man they could become developed, and thereby

fully human (21). Wynter therefore cautions against a narrative of human-made climate change, because:

> It thinks the causes of global warming are *human* activities, but they are not! The Masai who were (and are) being displaced have nothing to do with global warming! It's all of us— the Western and mimetically Westernized middle classes—after we fell into the trap of modeling ourselves on the mimetic model of the Western bourgeoisie's liberal monohumanist Man2. (Wynter and McKittrick 2015, 21-22).

Following Wynter's argument, the *anthropos* of the Anthropocene is not humanity as a whole, but rather the liberal monohumanist Man2 that presents itself as if it were the only mode of being human. The West has over the past 500 years brought the human species as a whole into its hegemonic, monohumanist conception of the human and ranked other modes of being human on a scale of development towards the Western ideal (Wynter and McKittrick 2015, 21). Yusoff, building on Wynter's theories, argues that the Anthropocene story is another attempt to overhaul the idea of the human to species "via geological epoch" (2018, 81). She writes:

> To achieve this ideal of the Anthropos as universal subject, the human needs to become both abstracted (from its previous forms of exclusionary humanism) and already populated in the form of the White Western master-subject whom Sylvia Wynter calls "Over Represented Man." (Yusoff 2018, 81)

The Anthropocene as geologic epoch risks inscribing this mode of being human as a universal geologic truth in the same way as Man2 is bio-evolutionarily held to be true. The species narrative

of the human obscures the genre-specific causes of climate change. Thereby the problem with the Anthropocene narrative, in a Wynterian perspective, is as follows:

> The "we" who are destroying the planet in these findings are not understood as the *referent-we* of *homo oeconomicus* […] *Therefore, the proposals that they're going to give for change are going to be devastating!* […] Devastating, because the proposals made, if nonconsciously so, are made from the perspective of *homo oeconomicus* and its attendant master discipline of economics, whose behavior-regulatory metaphysical telos of mastering Malthusian natural scarcity is precisely *the cause* of the problem itself. (Wynter and McKittrick 2015, 24, emphasis in original)

The 'they' in this quote refers to those who subscribe to the Anthropocene narrative. Wynter is essentially arguing along the lines of Audre Lorde's well-known statement that the master's tools will never dismantle the master's house. From within a knowledge system which collapses the environmentally destructive *anthropos* with the human species itself, the proposal that we need to reduce the human population makes sense. However, this proposed solution would not address the core problem, namely that the way to be a good human in the current knowledge paradigm is to become a neoliberal capitalist consumer constantly striving for economic growth. If there is indeed a problem of overpopulation, it is not of the human species but of Man – and the population of Man does not grow solely through birth, but also through the westernisation and spread of neoliberalism that is central to contemporary neocolonialism.

What is revealed here is not that only some people (Man-like humans) should stop making babies, which would still operate within a Malthusian knowledge paradigm, but rather that we need to do away with the descriptive statement of Western Man entirely. What this chapter has showed is that as long as we conceptualise 'humans' – in the universalistic understanding of the concept

wherein 'to be human' is to act in environmentally damaging ways – as the driving force of climate change, Malthusianism will hold sway. Instead, we must return to the feminist concern with the *who* (Colebrook 2017, 10) – who is speaking, who is acting, who is presenting himself as if he spoke for the species as a whole?

Flawed Calculations: Carrying Capacity and Population Statistics

In the introduction to Paul Ehrlich's influential 1968 book *The Population Bomb*, he writes:

> In a book about population there is a temptation to stun the reader with an avalanche of statistics. I'll spare you most, but not all, of that. After all, no matter how you slice it, population is a numbers game. Perhaps the best way to impress you with numbers is to tell you about the "doubling time"- the time necessary for the population to double in size. (Ehrlich 1968/1988, 3-4)

After that follows an "avalanche" of numbers, suggesting that if population growth continued at the present doubling rate of 35 years, world population would reach sixty million billion people in 900 years, at which point we will hit a "heat limit" where the collective heat generated by human bodies and activities is too much to be radiated away (Ehrlich 1968/1988, 4-5). This argument is followed by calculations of how long it would take to fill up the other planets of our solar systems - about 50 years for Venus, Mercury, Mars, and the moon, and 200 years for Jupiter and Uranus - and once those are "Earth-full," Ehrlich argues that "in a few thousand years everything in the visible universe would be converted into people, and the ball of people would be expanding with the speed of light!" (6).

These fantastical scenarios are meant to "impress" (4). They are not a prediction of the future per se but a cautionary tale meant to spur action in the present. Yet they are illustrated by numerical figures and calculations that lend them an air of truth - if indeed a "doubling time" of 35 years continues indefinitely, combined with technological developments that enable space travel, it could conceivably be possible that human populations would cover everything in the visible universe. One could question the mathematics – what is the surface area afforded per person in the calculation that Jupiter would be overpopulated in 200 years? Would it take more or less than 900 years to reach the "heat limit" of the planet depending on the level of greenhouse gases in the atmosphere? – but I am more interested in the foundational figures: the "doubling time" and the assumption that this rate can be projected into the future and measured in relation to some calculable "carrying capacity" of the planet. In Ehrlich's narrative, 'population' becomes a purely statistical concept divorced from living humans and the multitude of factors that influence a single human's decision to have a child. 'Population' becomes an abstract variable that can be calculated in a system of other abstract variables, like available land and air. At this level of conceptualisation, 'population' becomes a question of mathematics and physics. Terms like 'population' and 'carrying capacity' make intuitive sense, for the very existence of the terms imply that there is a measurable and calculable real object that they refer to. But is this really the case?

In this chapter, I therefore refuse to "spare" the reader the "avalanche of statistics" and instead double down on the role of statistics in the overpopulation discourse, questioning the role of numbers as a discursive mechanism. In the previous chapter, I discussed Donna Haraway's (2016) claim that there are too many humans for the Earth to bear, and contested her argument that anthropogenic climate change warranted a renewed concern with overpopulation. In this chapter, I turn to a different aspect of the question: Is it possible to disconnect the overpopulation argument from its origins and make overpopulation a feminist question, as Haraway claims?

In order to answer this question, I first engage in a critical evaluation of the concept 'population' itself. Haraway (2018, 84-86) argues that we need the concept population in order to think certain thoughts and have certain conversations, but I then want to ask what kinds of conversation the population concept enables, and which conversations does it make impossible? I draw on Michel Foucault's analysis of population as the subject of biopolitics, a subject which is created through a practice of measuring and sorting, and as such is a theoretical representation of aggregated individuals, not a reflection of a transparent entity. Since the invention of the population in the eighteenth century was a part of the general turn towards mathematics and statistics as markers of objectivity and transparency, the mathematical and statistical aspect of population as a concept helps obscure the fact that, just as any other concept, population is an abstraction that can be more or less good to think with.

Next, I discuss how the population concept is put to use as part of the calculation of 'carrying capacity', the idea that there is a measurable upper limit to population size based on available land and resources. Carrying capacity, too, is a theorisation of reality, so here I also unpack how this idea came about. The concept was originally used to measure quite concrete things – the cargo of a ship, the electricity in a power grid – but was applied to ecology and populations in the early twentieth century. Through the notion of carrying capacity as a measurable quality inherent to the environment, population became an adjustable variable and an experimental object in the calculation and regulation of carrying capacity, which was put into practice in some development projects in the mid-twentieth century. The question of carrying capacity was then applied to world population, or the human species as a whole, and used to argue that contemporary environmental crises are a sign that the global carrying capacity is being exceeded. However, I argue that the concept is no longer – if it ever were – good to think with, in part because it is empirically weak, and in part because it cannot account for and thus actively conceals the problem of intra-human differences.

This leads me to my third concern in this chapter, namely how 'surplus populations' are identified. Here I discuss the function of state racism in Foucault, and link it to a discussion of statistical normalisation. I argue that there are significant similarities between the statistical identification of 'expendable' populations and what Sylvia Wynter calls the 'monohumanist' Western Man as a mechanism that excludes all other modes of being human. In these calculations of population, certain life becomes valuable and thus investable, while other life is perceived as both quantitatively 'too-much' and as qualitatively 'no-good', and therefore disposable.

Population as a Statistical Figure

Donna Haraway's turn to a concern with overpopulation appeared to many readers as a turn away from feminist ideology, as "going over to the enemy" (Haraway 2018, 87). Therefore, she continually and preemptively defends her choice to engage with these questions, noting that "'population' is a state-making category" (88) and a mechanism of biopolitics that is not always for everyone's benefit but that, she argues, must be used anyway. She asks:

> How can progressive people deride those who reject anthropogenic climate change for their refusal to listen to scientists when we – the same people – call the models of population demography nothing but modernising ideology? Both sciences are based on model systems, big numbers, and imperfect data sets. (Haraway 2018, 88)

Haraway's argument is that 'population' is an imperfect concept, but one still necessary to think with. Others, most notably Michelle Murphy, argue that 'population' as a concept is so saturated with racism that it is intolerable to work with (Murphy 2018, 105). However, the concept is so deeply engrained in conventional thinking on policy, economics, ecology and life sciences that it is difficult to imagine a world not organised by 'population' as a concept (105). Indeed, the concept of

'population' as it is used in the overpopulation debate seems to have some kind of intuitive conceptual obviousness - we all know what 'population' means, right? In this section, I trouble this obviousness by asking how population is constructed. As Haraway notes, "made is not made up" (Haraway 2018, 84), but by asking how it is made we can determine its usefulness. To this end, I turn to Michel Foucault, who describes how 'population' emerged in the nineteenth century as part of society's organising and governing mechanisms.

In his 1975-1976 lecture series *Society Must Be Defended*, Foucault argues that the classical sovereign right of life and death underwent a change in the nineteenth century (Foucault 2003, 240-241). The sovereign's power was originally the right to "take life or let live" (241) and was exercised in the moment of killing; "it is essentially the right of the sword" (240). But over the course of the nineteenth century, this sovereign right was transformed or complemented by a new right - the power to "make live and let die" (241). This new power extends beyond the power to kill, i.e. power over death, but rather works to influence life to a greater extent. Foucault traces this power to the disciplinary technologies that were developed in the seventeenth and eighteenth centuries (241-42). These techniques of power centred on the individual body, disciplining and organising individual bodies through exercise, drill, and a system of surveillance. However, just as the power of life and death shifted in the eighteenth century, a new technology of power emerged (242). This new power operates on a different scale than disciplinary power, and thus uses different instruments. Unlike disciplinary power, which rules over multiplicities and groups only to the extent that they can be separated out into individuals again in order to regulate, train and use them, Foucault argues that:

the new technology that is being established is addressed to a multiplicity of men, not to the extent that they are nothing more than their individual bodies, but to the extent that they form, on the contrary, a global mass that is affected by overall processes characteristic of birth,

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death, production, illness, and so on. So after a first seizure of power over the body in an individualizing mode, we have a second seizure of power that is not individualizing but, if you like, massifying, that is directed not at man-as-body but at man-as-species. (Foucault 2003, 242-43).

This is what Foucault identifies as the move from an anatomo-politics of the individual human body, to the "biopolitics" of the human race. The main objects of knowledge and targets of control of biopolitics, as Foucault touches on in the above quote, are *processes* that concern the birth rate, the mortality rate, overall longevity, as well as the effects of the milieu in which human beings live – effects of the environment (245). Foucault also notes that demographers started to measure the above phenomena in statistical terms as part of the emergence of biopolitics (243). As Barbara Duden (2019, 163) puts it when commenting on this shift: "[s]tatistics became the new 'Latin' of all modern sciences." Duden highlights that what occurred in the eighteenth century was a shift from general reasoning and observations to the mathematical treatment of large-scale *data.*

Most importantly for my discussion, however, is the emergence of a new subject. The old theory of rights (i.e the sovereign's right to take life) and disciplinary technology dealt with the individual in relation to society, but the new subject of biopolitics is the population. Foucault describes the population as "a new body, a multiple body, a body with so many heads that, while they might not be infinite in number, cannot necessarily be counted" (2003, 245). When discussing population, the individual human being fades from view. In Duden's words:

Clearly the word that had been originally derived from *populare,* 'to people', had not only lost its active usage; in most contexts it no longer had anything to do with people. It now refers to a totality of objects which may as well be so many pellets as people. It

refers to a reproductive community that meets and mates with a defined probability. It

can refer as much to mosquitoes as humans. (Duden 2019, 163).

The population refers to an object of study and government rather than a material object as such; it emerges through a collection of data. Foucault argues that the phenomena that make up the domain of biopolitics only become visible at the mass level; they are structures and patterns that emerge on a large scale when studying populations over a period of time (Foucault 2003, 245-46). The mechanisms of biopolitics thus include "forecasts, statistical estimates, and overall measures" (246) and intervene at the level of generality - lowering the mortality rate, increasing life expectancy, modifying the birth rate - as opposed to intervening in individual lives by taking or granting life. Foucault writes that these mechanisms aim to control the "random element inherent in a population" (246) by establishing some sort of equilibrium, maintaining an average, and thus optimising – and securing – life. Just like disciplinary mechanisms, biopolitics aims to "maximize and extract forces" (246), but rather than disciplining the human-as-body it functions through regularising the human-as-species. The power of making live and letting die is implemented through regularisation (247). Furthermore, Robert Fletcher, Jan Breitling and Valerie Puleo argue that the State's success in "making live" is measured through statistics, the meaning of which is "literally the 'science of the state'" (2014, 1202). The population's life expectancy, morbidity, and overall growth rate become indicators of the State's ability to exercise biopower to maximise and extract forces from its population (1202-1203).

Indeed, this measure of state success is visible in the writings of Thomas Malthus, who argued that a good society is one with a steady growth rate relative to available land and resources. As Malthus put it: "there is not a truer criterion of the happiness and innocence of a people, than the

rapidity of their increase" (Malthus 1798, chap. VI).[14] Malthus's writings can therefore be understood as a part of this early nineteenth century shift in social power structures that Foucault describes. In the original edition of Malthus' *Essay on the Principle of Population*, he drew his data from the church records of the parish in which he worked as a reverend, and further illustrated his point with descriptions of past civilisations and the assumptions he drew about their populations (Hartmann, 2014, 757). Carole McCann adds that when he could not find numerical data, Malthus relied on travel literature and colonial reports (2016, 29), and in this way embellished his mathematical law with what Betsy Hartmann calls "scare stories" from the colonial imaginary (Hartmann 2014, 758). What numbers Malthus had acted as supplements to his general reasoning and observations, rather than as the basis for the analysis itself. Mary Poovey (1998, 279) argues that political economists in the 18th century often used "language that cast assessments of 'value' and national well-being in what looked like quantifiable terms" but seldom called for the collection of numerical data to answer their questions and deciding on policy recommendations. The first edition of Malthus's essay thus used mathematical language, but not statistics and biopolitics as such.

However, the many editions of Malthus's essay came to "constitute a crux in the history of modern fact," (Poovey 1998, 283) as the later editions came to include numbers to a much greater extent and used tables and numbers to theoretically demonstrate his points, which Malthus had previously only asserted in general terms. Mary Poovey argues that Malthus's *Essay* thereby helped rework "the cultural connotations of numerical representation," contributing to an understanding of numbers as impartial and methodologically rigorous (283). While Malthus was of course not solely responsible for the revaluation of numerical method, his work reflected the more general epistemological shift: as Malthus's project proceeded, he moved from narrative accounts to numeric

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[14] Conversely, many colonial administrations saw declining population size in the colonies as a sign of 'civilisational decline' or proof that the colonised people belonged to a 'dying race'. See for example Baker-Médard and Sasser (2020, 15).

evidence (McCann 2016, 24). Poovey emphasises that Malthus also advocated for some kind of empiricism, to "go out and look", observe, measure and count, in order to find and document the reality of a population that was 'out there' (Poovey 1998, 285-86). She notes that Malthus travelled in Europe to collect more numerical information for his revisions, and also called for a standardisation of the collection of statistical data (283). For example, Fletcher et al. (2014, 1198-1199) point out that Malthus influenced the implementation of the 1800 Census Act in England to monitor growth rates. The idea was that this kind of large-scale statistical data would bridge the gap between particular and general knowledge, and would substitute inductive reasoning with deductive reasoning (Poovey 1998, 283, 286). The association between quantitative reasoning and impartial science lent credence to subsequent population scholars and demographers. This was one reason why twentieth-century demographers claimed Malthus as their disciplinary forefather, as he helped establish their field as politically impartial and scientifically rigorous (McCann 2016, 23-24). The claim held up regardless of the accuracy of Malthus's own predictions – for instance, food production has far exceeded Malthus's projected growth rate – because it could be argued that Malthus simply had no access to better data at the time.[15]

In Foucault's discussion of biopolitics, he mentions Malthus only in passing, noting that the "well-known opposition between Malthus and Marx" originated in a differing opinion on the concept of population (Foucault 2007, 107). However, given the significant role Malthus's work had in the birth of statistics and demography – as mechanisms/technologies focused on the problem of population management – Malthus must be considered a central actor in the birth of biopolitics as well. If the concept of 'population' and the accompanying discipline of demography have Malthusian roots, what does this mean for how population as a concept is made?

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[15] Indeed, McCann (2016, 31) finds that Malthus himself argued that he lacked sufficient data, which was a driving force behind his work to develop statistics.

The creation of 'population' as a category must necessarily entail choices concerning what to include and exclude, which information to record as data points and which is irrelevant. Taking the census as an example of a population-making mechanism, McCann argues that the census was introduced as an instrument that "classified, counted, and aggregated 'pertinent' bodies within a territory, producing a variety of new totalities: the social body, the nation, the people, the general public, mankind, and society itself" (2016, 32). The census also enables the quantification of categories like genders, races, and ethnicities, and maps them onto geopolitical territories - groups are classified as belonging to the area in which they are counted, they become part of the territory. However, the fiction of the census is that it is a representation of the population that reflects reality as closely as possible. In Bruce Curtis' words, "the theoretical outer limit of population is the mass of undifferentiated human bodies," yet "empirical configurations of social relations as population cannot attain this limit" (2002, 26). Curtis argues that since the census cannot be based on observations of every single individual, it is impossible to construct a model of the population that does not in some way abstract the mass of bodies (25-26). In practice, census making requires the census-maker, the knowledge-producer, to make categorical choices, and this makes it a *disciplinary* and *regulatory* practice in the Foucauldian sense. Statistically *creating* the population is thereby inherently a political practice, not a "simple" empirical observation or recording of data. However, the mathematical/statistical aspect of population as a concept lends it a degree of presumed objectivity and transparency, which helps conceal the fact that just like any other concept, population is an abstraction. Sabine Höhler further points out that statistics gives population "the epistemic status of a life form with a past and a future development" (Höhler 2007, 46).

Having established how population is made, I can now turn to the question of how population as a statistical concept is *used*. What is the potential danger of thinking with population in the abstract? Höhler suggests that the concept of 'population' thrived in environmental and developmental discourses in the 1960s and 1970s because it was a variable on equal terms with

capital, labour, or technology in world systems thinking (46). In this context, particularly in environmental discourse, world population became a function in the calculation of available human living space in ecological terms, in other words the Earth's 'carrying capacity' (46-47). Through 'carrying capacity', another mathematical/statistical concept, biopolitics and geopolitics are linked together, suggesting the possibility of an ecological calculation of the upper limits to population growth based on available land and resources. In discussions of anthropogenic climate change, it can thus be used to provide a statistical – and thereby perceivably objective – argument that overpopulation is a global environmental threat.

"Let P = Population": Calculating Carrying Capacity

The central claim in Ehrlich's (1968/1988) *The Population Bomb* is that human populations already have, or soon will, exceed the available resources on the planet, thus resulting in ecological catastrophe. In other words, we will exceed the 'carrying capacity' of the planet. The notion of a 'carrying capacity' implies that there is a measurable and calculable limit to population size in an enclosed environment. Given that population is an abstraction that can be more or less useful to think with, how does 'carrying capacity' function and how is it constructed? I discussed briefly in the first chapter how the term emerged in the early twentieth century through the work of biologists like Raymond Pearl and later in the 1930s by conservationists like Aldo Leopold, who applied the notion of natural ecological limits to wildlife management before turning to human populations in the 1940s. However, the term also has a longer history outside of population debates.

Nathan Sayre, who has reconstructed an excellent genealogy of the term 'carrying capacity', notes that it is used in a wide variety of fields, such as wildlife management, chemistry, medicine, economics, anthropology, engineering, and population biology (Sayre 2008, 120-121). In political debates, the term is sometimes used to justify hunting practices, but is most commonly seen in environmental debates where it supports neo-Malthusian arguments about limited natural resources

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in relation to population growth (121). Sayre argues that for a term so widely used, and so widely criticised, its origins remain obscure. For all that it is used in Malthusian arguments, Malthus himself never used the term and, as already mentioned, it was not applied to human populations until the 1940s. Instead, Sayre finds that the first documented use of the term was in the shipping industry in 1845, where it was used to distinguish between tonnage[16] and what the ship could actually carry in terms of tonnes or volume of cargo (122). The original meaning of 'carrying capacity' refers to the amount of X that Y is able to carry, where X is clearly calculable and expressed as a number. The term soon expanded to cover other means of transportation and the X was no longer limited to volume or weight. For instance, Sayre notes that the term was used to express the capacity of Paris's electric railroad (measured in persons carried per hour), or the capacity of irrigation ditches or pipelines to carry water, or even transmission lines' capacity to carry electricity (123). These uses of the term persist until today, especially in engineering, where 'carrying capacity' is a quantitative measure of human-made objects or systems and thus calculable with reasonable precision. In Sayre's words, carrying capacity here "refers to the amount of X that Y was *designed* to carry" (123, emphasis in original).

In the 1870s the term was first applied to natural systems or living organisms, but still referred to the amount of X that could be transported or carried by Y, with the latter now including animals, humans, or natural phenomena like a river. However, Sayre suggests that this extension of the possible Y's enabled the next transformation of the term, where 'carrying' took on a more figurative meaning. Sayre explains that "what was previously a Y – the animals that carried things – became instead the X being 'carried' by the land where they lived" (2008, 124). Carrying capacity had become a measure of rangeland productivity by 1889 and was institutionalised in land leases that

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[16] Tonnage refers to a ship's cargo, calculated by the ship's size rather than cargo by weight. Taxes and duties were calculated based on tonnage, but with the advent of steam ships tonnage was no longer a fair distinction, as a smaller sailing ship could carry more cargo than a larger steam ship which used space for engines and fuel (Sayre 2008, 122).

allowed for X number of animals to graze on Y area of land. Carrying capacity thus facilitated the bureaucratic administration of land and became a tool of governance (124). At the time there was no question that there existed such a thing as a fixed carrying capacity, and that it could be accurately calculated or even improved by good land management. It was soon exported from rangeland management to wildlife management and thus emerged in the more familiar context of ecology.

Sayre finds that this link to ecology is very direct and specific. The conservationist and later professor of game management Aldo Leopold, who I discussed in chapter one, first encountered the term in 1914-1915 when he worked with land management and grazing for the U.S. Forest Service, where carrying capacity was used to measure rangeland productivity for grazing livestock (2008, 125). He then applied the term in his later work on ecology, particularly in his writings about the deer population irruption that occurred on the Kaibab plateau in the 1920s. Leopold's work strengthened the notion that carrying capacity was not inherent to the land, but rather could be decreased by poor management and overpopulation, and conversely improved by good management. Sayre suggests that Leopold's use of the term, with his emphasis on the fluctuations in carrying capacity, almost managed to disconnect the term from the ideal and static norm that the term implied (126). However, Sayre also argues that the term itself begs the question of "how many animals a given habitat could support at a particular point in time" and "simply using the term implied that such a number could be determined" (126). So, despite Leopold's effort to make carrying capacity more dynamic and flexible, it was soon applied to human populations (including by Leopold himself in a 1941 speech) with the ideal of a static and calculable limit in mind (126). It was also put in practice quite directly and coercively – the colonial administration in today's Zambia, then Northern Rhodesia, applied the notion of carrying capacity in order to redistribute populations according to ideal carrying capacity: "Accordingly, in the years 1942 through 1945, the colonial administration effected the 'transfer' of 'about 52,000 people' in hopes of restoring 'a complete population–land balance throughout the area'" (127). The imperative driving these

transfers was increased production and labour exploitation, and the methods used in colonial Northern Rhodesia were 'refined' in later development projects. Pastoralists in Africa and other areas were forced to endure (although it was expressed as voluntary changes) destocking, relocation and sedentarisation according to the carrying capacities calculated by (Western) range scientists in the name of development. Only some decades later did scholars conclude that carrying capacity as a policy tool had been fundamentally flawed, as results failed to materialise.

In the 1950s, 'carrying capacity' was expanded to a global scale, where X came to mean the human species as a whole and Y referred to the Earth. Sayre links this expansion to the work of ecologist Eugene Odum, who in turn drew on the work of Raymond Pearl (127). Pearl, working in the field of population ecology (Höhler 2007, 49), had developed the 'logistic curve', an S-shaped curve that supposedly represented characteristic population growth, and Odum argued that the upper asymptote of this curve (the upper level beyond which no further increase can occur unless other variables change) represented the 'carrying capacity' or the 'saturation point' of the environment in question (whether that was a closed bottle in a laboratory, a specific national park, or the planet as a whole) (Sayre 2008, 127). Michelle Murphy points out that Pearl "discovered" the logistic curve through studying fruit flies, *drosophila*, enclosed in bottles, and recording the pattern of growth and decline in these closed containers (Murphy 2017, 1-2). However, he claimed that this growth curve was universal and could be abstracted as a natural law that applied to all life everywhere (2). Murphy writes:

> Importantly, his work turned "population" into an *experimental object* that could be tested and probed with the aid of fruit flies, bacteria, or chickens. Laboratory experiments could be done to populations of organisms in controlled settings. (Murphy 2017, 3-4, emphasis in original)

Pearl then went beyond the lab and used state-produced data from censuses to model human populations along the same curve (4). In particular, he relied on data from colonised Algeria, as the French colonisers kept detailed records of births and deaths, enabling Pearl to view Algeria as "a natural petri dish" (5). On this scale, population as a problem existed at the intersection of biology and economics. The closed universe of the bottle came to stand in for the "national economic production" (4). However, while Malthus's old model of population depended on a pre-determined and fixed production rate – arithmetic increase (or acre after acre, as Malthus put it) which would always inevitably lead to overpopulation and then 'die-off' – Pearl believed that production rates were "variable and *adjustable* depending on levels of civilization" (4). The limit was no longer dependent on access to land, but on how that land was utilised. Taking the national economy as the physical limits of population growth, that limit shifted depending on the specific economic system: an agrarian society would have a lower limit (i.e. a smaller bottle) while Pearl's ideal of industrial, consumptive capitalism would maximise carrying capacity. Unlike Malthus's doom-and-gloom narrative, Pearl's model opened up plenty of opportunities for intervention and biopolitical management, for 'optimising life' in the Foucauldian sense.

The idea that there could be an abstract growth curve that was universally applicable fits in the larger mid-twentieth century turn towards more mathematical ecological practices, modelled on the sciences of physics and chemistry. Sayre explains that ecologists like Odum in the 1950s believed that "ideal and fixed environments revealed ideal, fixed carrying capacities" (Sayre 2008, 128). Laboratory studies would reveal the "intrinsic" carrying capacity and growth rate as it would be in the absence of "environmental resistance" (128). Therefore, even if the "upper asymptote" of the growth curve, or the carrying capacity, could never be observed in the field, it existed mathematically and could thus be used to develop models and support population policy.

But then follows the question of how to measure the environmental resistance. The problem of how to distinguish between the environment and the "inherent" growth rate of organisms as

factors in the calculation of the ultimate population growth rate is exacerbated by the variability of the environment, and even more so if one accepts the fact that carrying capacity can be intentionally shifted by human (ill-)management of the environment and the economy (Sayre 2008, 129). However, there is a troublesome self-validating argument in this formulation of carrying capacity: any downturn in population growth would represent an instance of reaching the limit of carrying capacity, and continued growth would mean that the carrying capacity had changed, increasing the upper asymptote. Sayre argues that the model is a tautology, that is, it is ultimately self-validating:

> Carrying capacity, as Odum formulated it, expressed with precision what could be expected if a population lived without relation to its environment. This could never occur empirically, of course, but knowledge of such a norm nonetheless allowed every observed deviation from it to appear as an actual shortage of some environmental resource. (Sayre 2008, 130)

This use of the "logistic curve" to express the relationship between population growth and natural carrying capacity thus constitutes a "scientific" validation of the "principle of population" as Malthus expressed it almost two centuries earlier: that in the absence of environmental constraints, life would grow infinitely until it overpopulates the Earth. The fact that it has not yet done so means that there must exist environmental constraints - and thus the principle proves itself to be empirically true (Sayre 2008, 130). Furthermore, scholars like Paul and Anne Ehrlich or Garrett Hardin could use the principle to argue that overpopulation has already occurred, by claiming that "if the long-term carrying capacity of an area is clearly being degraded by its current human occupants, that area is overpopulated" (Ehrlich and Ehrlich, cited in Sayre 2008, 131). By that logic, overpopulation is clearly a global reality considering what we know today about climate change and global warming.

However, just as population is a theorisation of individual lives in the aggregate, carrying capacity is a theorisation of possible natural limits, but neither of the concepts – as conceptual abstractions – reflect reality in all its complexity. The question then follows whether the theoretical work these concepts do is useful/valuable or harmful, and whether they are still good to think with. Sayre argues that the main empirical weakness of the concept of carrying capacity is that it cannot be tested nor refuted - it cannot be observed outside of a laboratory environment because there are too many fluctuating variables, and is thus only presumed to exist, without any way to challenge or verify this presumption. Nonetheless, the term persists, likely due to its usefulness in management practices. Sayre writes:

> Even when carrying capacities proved illusory, they provided an appearance of objectivity, rationality, and precision to policies that might otherwise have been revealed as politically or economically motivated. (Sayre 2008, 132)

Sayre argues that carrying capacity as a concept has always strived to conceive of environmental limits as static and quantifiable, which has lent it an air of authority and linked it to "impartial" science. It has also continually been employed by agencies of the state, which again has reinforced the appearance of objectivity both for the state policies it has supported and for the concept itself (Sayre 2008, 132). In the many fields that have employed carrying capacity, including wildlife management, livestock grazing, sociology, anthropology, demography, and ecology, it has taken decades before the weight of evidence caught up and disproved the concept, but today scholars from many of those fields have abandoned the use of the term (Sayre 2008, 121). Yet the concept still appears in contemporary discussions, either explicitly or through the assumption that there are "natural limits" to human population growth and that our contemporary environmental problems are a consequence of human numbers pushing up against those limits. Sayre argues that the problem

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with the term carrying capacity is that once you use it, you implicitly accept that such a thing exists, even if it cannot be specifically determined (132). In attempting to answer the question 'how many people can the Earth support?' you fall into the trap of assuming that such a number, such an absolute limit, exists at all. Interestingly, Ehrlich (1968/1988) himself touches on this problem, arguing that we must understand population pressures as they are right now, not as they might be in an ideal world. He writes, ironically:

> *If* lions ate grass instead of antelopes, the plains of Africa could support many more of them before the plains would be overpopulated. Similarly, the carrying capacity of Earth for saints is considerably higher than the carrying capacity for *Homo sapiens.* In theory, the problem of human overpopulation could be solved by a reduction in population size or by a change towards more saintly behavior. (Ehrlich 1968/1988, 224, emphasis in original)

Ehrlich presents this argument as a point against those who would focus on distribution of resources rather than reducing population growth, but if we take it literally the quote begs the question of what the behaviour of Homo sapiens is, and what more saintly behaviour would be. Thus, keeping in mind my discussion in the previous chapter, where I argued with Sylvia Wynter that the Human should be understood as *praxis* rather than a natural *being*, I turn in the last section to a discussion of how 'surplus' populations are identified. Crucially, the very notion of 'surplus' itself implies that there exists a population limit that can be exceeded.

The Calculus in Human Life: Identifying Surplus Populations

The continued use of the concepts of 'carrying capacity' and 'population' (as well as 'overpopulation') has led to scientific studies and policy work which project long-term population

trends alongside greenhouse gas emissions (and other environmental trends, like overfishing or loss of biodiversity) and thereby suggest that slowing down population growth would lead to climate change mitigation (Ojeda, Sasser, and Lunstrum 2020, 318-319). Diana Ojeda, Jade Sasser and Elizabeth Lunstrum argue that such projections are "linked to a calculus in human lives, in which some lives are deemed avertable in the service of global scale environmental goals" (319). Betsy Hartmann, Anne Hendrixson and Jade Sasser (2014) also question this troublesome result of the population–carrying capacity problem, writing that:

> The logic of averted-humans-as-averted-emissions raises significant questions about the power dynamics of how value in human life is assigned, to/by whom, and at what scale. To borrow a phrase from feminist technoscience scholar Michelle Murphy, it reflects strategies of the economization of life, in which certain lives are deemed investable, others expendable and avertable. (Hartmann, Hendrixson and Sasser 2014, 74)

Following this line of questioning, I return once more to Foucault's discussion of population and biopolitics in order to discuss the underlying problem of racism that lies hidden at the core of this concept and informs the differential designation of value to human lives.

Once Foucault has established the emergence of 'population' as a regulatory mechanism of the biopolitical power to 'make live and let die,' he asks what becomes of the sovereign power to kill (2003, 254). A society founded on biopower has as its main objective to improve the quality and duration of life, so how does it justify calling for death? Foucault argues that this question becomes particularly relevant in the context of war, where both enemies and citizens are exposed to death, but it also comes up as the subtext of overpopulation debates. The argument that there are too many people implies that the population size must somehow be reduced, which necessitates either active killing or the prevention of future births, and how are these actions justified for a power whose

primary objective is to make live?[17] Foucault proposes that it is in response to this dilemma that *racism* is inscribed in the mechanism of power (254).[18] Racism, in Foucault's argument, is "primarily a way of introducing a break into the domain of life that is under power's control: the break between what must live and what must die" (254). The primary function of racism within this mechanism of power is to fragment the population, creating subspecies within the larger human species and thus enabling differential treatment. Racism also has a second function: establishing a relationship of war between the different fragments of the population. The argument that "if you want to live, the other must die" traditionally applies in military contexts, but is now transposed onto the exercise of biopolitics (255). Foucault explains this new biological relationship:

> The more inferior species die out, the more abnormal individuals are eliminated, the fewer degenerates there will be in the species as a whole, and the more I—as species rather than individual—can live, the stronger I will be, the more vigorous I will be. I will be able to proliferate. (Foucault 2003, 255).

In this context, the death of the "other" not only guarantees one's own safety, but also makes the population in general healthier and "purer" - death becomes a means to 'make live'. In a biopolitical system, Foucault argues, killing is justified through the argument that it removes a biological - rather than political - threat to the population (256). Racism is thus of vital importance to the practice of biopolitics:

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[17] Interestingly, Donna Haraway (2016) argues that population size should be reduced through different kin-making practices, by changing the norms of family structures and increasing the ratio of parents per child. She thus attempts to circumvent the problem of death/killing entirely.

[18] Foucault notes that racism was certainly not invented here, but that a certain function of racism was inscribed in the mechanisms of the State (Foucault 2003, 254).

In a normalizing society, race or racism is the precondition that makes killing acceptable. When you have a normalizing society, you have a power which is, at least superficially, in the first instance, or in the first line a biopower, and racism is the indispensable precondition that allows someone to be killed, that allows others to be killed. Once the State functions in the biopower mode, racism alone can justify the murderous function of the State. (Foucault 2003, 256).

Notably, Foucault claims that a state that wants to work with a technology of normalisation must necessarily become racist - racism is so ingrained in the mechanisms of power that normalisation does not function without it. Normalisation requires a fragmentation of the population into desirable and non-desirable groups, based on the general processes ascribed to these groups. For example, attempts to lower fertility requires the elimination of groups with high fertility.

But how does one determine what is 'high fertility', for instance, or which populations need intervention in order to slow down or cease population growth? Elaborating on this process of statistical normalisation, Carole McCann turns to the notion of the 'average man', which was first calculated by the Belgian social statistician Adolphe Quetelet in 1825 (2016, 34). Quetelet used census data to calculate the numeric average of the height and girth of a Belgian man, and used the numeric average to express typicality. McCann writes:

The equation of the aggregate mean with the average individual has since become ubiquitous. Arithmetic figures of who "we" are (what we do, think, eat, possess) routinely parade through all sorts of public discourses. Such numeric representations meld the aggregate mean, the typical, and the ideal, solidifying the descriptive average as the standard, the prescriptive norm. They exemplify the kinds of people who should and do belong. (McCann 2016, 34-35).

These normative prescriptions are based on mathematical principles and are thus given credence as objective fact, when indeed there is a slippage between the aggregate mean, the average 'man', and the ideal citizen. McCann notes that Quetelet calculates the "normal distribution under the law of error," (2016, 35) using a mathematic principle developed by astronomers to account for errors in their observations of the stars. The law of error is a technique of statistical normalisation wherein a normal probability curve is calculated based on the arithmetic mean, and observations that deviate from the mean can be qualitatively measured as more or less flawed based on their distance from the mean. However, McCann notes that the difference between astronomers' use of the law of error and Quetelet's idealisation of the mean is that "while the errors in celestial observations resided in the observations, not the stars, in the case of human variations, the flaws resided in the observed" (2016, 35). Thus, the mathematical law of error was used to define the ideal and the abject human beings based on their relation to the idealised average 'man'. These deviations could occur on both sides of the norm; for example, a woman who had too many children could be characterised as hypersexual and irresponsible, while a woman who had fewer or no children (below the replacement rate – another statistical figure) as unwomanly or selfish (McCann 2016, 37). Ian Hacking (1986) notes that the articulation of a norm and the condemnation of deviations from that norm can influence behaviour, as people attempt to act in accordance with the standard. The shift in behaviour of course affects future measurements, contributing to the self-naturalisation of the norm.

There are many similarities here with Sylvia Wynter's (2003) argument that the "descriptive statement" of the human is auto-instituted – that the idea of the human as a natural object is discursively created by humans themselves. Statistical normalisation is one mechanism of instituting the norms that determine the right 'praxis' for being human. McCann (2016, 35-36) argues that eugenicists went on to develop the full potential of statistical normalisation in the early

twentieth century, representing and analysing social differences like class, race and ethnicity (in the colonial context) in statistical terms. Among them was Francis Galton, one of the founders of eugenics discussed in chapter one, who developed the basic statistical tools of correlation and regression. Foucault's theory holds that racism is an intrinsic part of technologies of normalisation, and the use of the newly developed statistical tools in the early twentieth century follows this principle. As McCann notes, the early population scientists were deeply concerned with differential fertility rates among different "classes" of people, because of fears that this might "degrade" the overall population in the long run (36).

Here McCann touches on a central aspect of population science, and the developing discipline of demography: the concern with the *future* population. In Foucault's "society of normalisation," disciplinary and regulatory technologies are concerned with *trends* in the population, attempting to regulate risks and probabilities, rates of birth and death. Within this statistical surveillance of population trends over time, sudden change becomes irregular, non-normative and thus problematic (38). For example, the 20th-century increase in global population growth rates became characterised as threatening based on its deviation from "the true rate of natural increase," calculated by Albert Lotka and Louis Dublin in 1925 (39). Their mathematical models accounted for differentials in age and sex in different populations, and could thereby calculate the "true" reproduction rate of a population, expressed in "doubling time," the time it takes for a population to double in time. McCann notes that these models are still commonly used in demographic projections, particularly because they can be used to compare population statistics between geographical regions and social groups based on their vital statistics (39-41). Demographic projections of future population trends also rely on these methods, but, McCann argues, these forecasts are always necessarily hypothetical because they rely on the vital statistics that in turn are political constructions rather than an accurate reflection of the population as an empirical object. McCann writes:

Therefore, they are a theory of the future. They are not a prediction of what will happen, but of what might happen if the assumptions in the model prevail in the world. Nonetheless, through such "chains of observations of observations," demographic knowledge solidified the normative judgment that the world was already overpopulated, that parts of it were suddenly growing too rapidly, and that the effects of current patterns would reverberate into the future. (McCann 2016, 41).

These forecasts are less interested in predicting the future, and more concerned with creating a future which verifies the model, a sort of self-validating theory. Statistical normalisation thus serves to establish overpopulation as a real and impending problem, and thereby justifying state intervention and marking statistically aberrant populations as 'killable'.[19] Of course, "killing" does not always mean outright murder, but also includes greater exposure to death, increased risk of death, political death, social rejection, and so on (Foucault 2003, 256). Indeed, Jade Sasser notes that population-environment advocacy seldom calls for the outright killing of other populations, but there have been calls for "the selective suppression of life through restrictive food aid policies, withholding medical care to rapidly growing populations, and forced restrictions on fertility" (Sasser 2014, 1245). However, I would argue that more often, the identification of 'killable' population happens more indirectly, in the designation of target countries for development and family planning projects. For instance, the designation of countries in sub-Saharan Africa as an environmental threat because of their high fertility rates, despite the fact that those same countries have among the world's lowest emissions per capita, implies that those populations are somehow 'expendable' – particularly when family planning programs are described as "more cost-effective than most low-carbon technologies" (Hartmann 2014, 766).

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[19] As an example of this, see Betsy Hartmann's (2014) analysis of the Malthusian Anticipatory Regime in Africa, in which predictions of future scarcity serve to shape policy and security interventions in the present.

Additionally, 'undesirable' populations can be reduced by transforming them into something else. In the previous chapter's discussion of the praxis of being human, I argued, with Sylvia Wynter, that the idealised version of Man, or the anthropos, is reproduced through action/behaviour rather than solely biologically (i.e. being born). Wynter argues that the hegemonic script for how to 'do' humanness requires one to model oneself after the Western monohumanist version of Man. Those who do not align with this norm are seen as sub-human or even nonhuman – or statistically perceived as 'aberrant' and therefore problematic. This aligns with Foucault's (2003, 258) view that the biopolitical racism that inscribes certain populations as 'killable' does not follow traditional patterns of racism – it is not about skin colour or colonial racialisation, it does not have a "stable biological meaning" (77). Instead, 'race' for Foucault stands for naturalised social groups that are distinct from the population as a whole:

> It will become the discourse of a battle that has to be waged not between races, but by a race that is portrayed as the one true race, the race that holds power and is entitled to define the norm, and against those who deviate from that norm, against those who pose a threat to the biological heritage. (Foucault 2003, 61)

Foucault does not go into detail on how colonial racialisation plays a role in this conception of racism, as the subject of biopolitics in Foucault's work is mainly unmarked (by gender, race, or ethnicity). Foucault has been criticised for this failure to engage explicitly with colonialism, and for not discussing the role colonial institutions played in developing and perfecting these practices of governance (Wilson 2012, 155). Conversely, Laura Ann Stoler suggests that this is one strength of Foucault's work, because it enables this theory to be applied in different contexts (Stoler 1995, 88).

In the context of the overpopulation argument, I argue that the unmarked subject is best understood as the ideal of the Western imperial, industrial, capitalist and consumerist man. Reading

Foucault's notion of biopolitical racism alongside Sylvia Wynter's analysis of the human, we can argue that Western Man's overrepresentation of itself as the only correct 'mode' of being human positions Western Man as the norm-defining 'one true race' and all other ways of being human as deviations from the norm. The statistical production of the population, and the normative judgements inherent in that process, further serve to reinforce the notion of Man, or anthropos, as the normative ideal. Recalling Ehrlich's posed opposition between the 'real' Homo Sapiens and the saint, it is understandable that within the knowledge paradigm where Man is the only way to be human, becoming more 'saintly' (or indeed less capitalist and consumptive) is unthinkable. Within this knowledge system, Foucault's description of state racism as "some must die so that others might live" is best understood as "some must not be born so that future others might live more abundantly (consumptively)" (Murphy 2017, 41).

Conclusion

In the introduction to this thesis I posed the question: if we imagined that we could reduce the population size in an ethical, non-coercive way, how would we know when to stop? What is the model of the 'ideal population' that enables the claim that the planet is, or is threatening to become, overpopulated? Ultimately this became a question of discourse: how does "overpopulation is an environmental threat" become a meaningful statement?

These questions are significant because scholars and policy makers are already operating under the belief that the planet is, or will soon become, overpopulated. This has led some scholars to draw a direct link between population growth trends and global environmental degradation, which serves to construct population reduction as a climate change mitigation strategy. This kind of "calculus in human lives" creates a situation where some lives are seen as disposable or 'avertable' in favour of larger environmental goals (Ojeda, Sasser and Lunstrum 2020, 319). The avertable 'surplus' populations are often positioned in so-called 'developing countries' with high fertility rates, regardless of their generally low per capita environmental impact (Hartmann 2014). In practice these strategies have often taken the form of coercive and racialised population control strategies that primarily seek to control the fertility of women in the Global South, and can include everything from forced and unsafe sterilisations to international aid being made conditional on the use of contraceptives (Wilson 2017a, 2017b). But the overpopulation argument has not only guided policy making; it has made its way into critical theory, including feminist theory and feminist discussions of the environmental crisis. Here we find Donna Haraway, who turns against these extreme and coercive forms of population control, but argues that we must find feminist, anti-racist, and non-coercive ways to tackle the problem of a "human-heavy world" (2018, 98).

However, instead of trying to find feminist population control mechanisms, I argued in this thesis that we must question the entire premise of the overpopulation argument. If we agree that the

climate crisis needs solving, we must correctly identify its causes. By critically evaluating the overpopulation argument, I aimed to show whether or not this is an argument with any credence, and if not, why it has nonetheless been so convincing.

In chapter one, I performed a genealogy of the overpopulation argument, tracing it back to Malthus's first formulation of the population principle in 1798. Malthus argued that it was an inherent fact of nature that population size would always outgrow the rate of production, thus resulting in miseries like war, poverty, and famine. Malthus further located the source of this problem in human nature, in the 'natural' drive for reproduction, which could not be easily tempered. This led Malthus to argue against charity and other poverty-alleviating measures, as he believed such miseries to be necessary in order to keep the population in check. However, he also argued that 'more civilised' people could better control their 'passions' – thus making statistics over total population size, birth rates, and death rates a measure of civilised development. These ideas were taken up and developed in several different contexts. The principle of population was used to argue for the need for colonial expansion, as more land was needed to house growing populations. But interestingly, the same principle was also put in the service of a brand of anticolonialism that believed land should be divided up according to need and effective use, rather than by the power of empires. Malthusianism also informed Darwin's development of the concept of 'natural selection', which was picked up by the discipline of eugenics and turned into a concern with the 'quality' of the population. Finally, population became an environmental question in the twentieth century through concepts like 'carrying capacity' and 'land degradation'. Fears of overpopulation exploded in 1968 through the work of writers like Paul Ehrlich, Garrett Hardin, and the Club of Rome, who emphasised the notion of absolute limits to growth and linked human actions to environmental problems, thereby making population size a crucial concern of the environmental movement in the 1960s and 1970s. Haunted by accusations of racism, the concept of overpopulation fell out of

favour with the environmental movement by the 1990s, but the core concerns of environmental limits and carrying capacity remained.

By looking at the history of the concept of overpopulation, I deconstructed the commonsensical understanding of overpopulation. Rather than being a natural law inherent in the human species, I have pointed out how the idea that there are 'too many' humans has been constructed and reconstructed in service of different and sometimes contradictory political projects. The overpopulation argument could be used to defend or attack the project of colonial expansion, or to argue that one nation-state had a greater claim to an area of land than another. It has been used to frame eugenics as a humanitarian project – if the 'surplus' populations will die in misery anyway, is it not more ethical to prevent their birth in the first place? The fear of overpopulation has also been mobilised to call attention to environmental issues and climate change. This versatility of the argument may explain its long-term resiliency in spite of heavy critique. Starting my thesis with the history of the concept has also served to reveal its roots in colonialism, racism and eugenics, which still reverberate today. Even as it has been presented as a purely mathematical or scientific theory, overpopulation discourse has always been co-constituted with racist and colonial discourse and consequently has tended to target specific populations as problem-populations: the racialised and the poor. This tendency, which was visible in Malthus's original writings, reappeared in the many iterations of the argument and is still present in contemporary family planning interventions, which primarily target so-called 'developing countries' in the Global South.

The second chapter takes up where the first one left off, looking at the echoes of Malthusian thinking in contemporary critical and feminist theories concerned with the environment. I showed how the overpopulation argument has become linked to and reinforced by the narrative of the Anthropocene, the idea that we are now in a new geologic era marked by humans as the primary geologic actors. The idea of the Anthropocene has urged some feminist thinkers, most prominently Donna Haraway, to argue that a too-large human presence on the Earth has become an

environmental threat, and feminists must take up the struggle against overpopulation. In this chapter, I unpacked Haraway's argument and analysed its two main components: the concept of the Anthropocene and the very notion of the human. Discussing the many proposed starting dates for the Anthropocene – ranging from the start of colonisation and slavery in 1452 to the first nuclear tests in the mid-twentieth century – I pointed out that all of them are more concerned with human *actions* than with human numbers as such. Additionally, based on its origin stories, the Anthropocene appears to be a project driven by a relatively small, elite group of Western men. This prompted the question: Who is the *anthropos*? Here I turned to Sylvia Wynter's analysis of the human, as she argues that the Western industrialist, capitalist Man has become overrepresented as the human itself. Wynter argues that at the end of the eighteenth century, the Darwinian idea of natural selection came together with the Malthusian idea of natural scarcity to create a new genre of 'human,' for whom the criteria for being a good human of one's kind includes development and material accumulation. Wynter further argues that the West has 'unified' the human species under one 'ethno-class' of being, which enables the Anthropocene narrative to claim that environmental degradation is caused by the human species, the *anthropos* as a whole, thus overlooking intra-human difference. The Anthropocene narrative also risks naturalising this environmentally destructive behaviour as part of human evolution, through the notion that all fully developed, civilised humans act as the *anthropos* do.

With this chapter, I called attention to how the overpopulation argument works to conceal or circumvent the real problems of climate change – namely the industrial, capitalist, imperialist systems that depend on destructive behaviours. Haraway argues that we must "stay with the trouble," and therefore believes that we must stay with the trouble of overpopulation and work to free it from its colonial and racist history, but what if she has identified the wrong problem? What if the "trouble" is the overrepresentation of Western Man as if it were a reflection of humanity as a whole? My argument is that overpopulation as a problem is posed within an existing system of

knowledge that limits what is conceivable. If the human is indeed the *anthropos*, then it needs to be reduced. But if the *anthropos* does not equal the human species, the problem lies elsewhere. Furthermore, from this perspective, it is an impossibility to solve the climate crisis via adjusting population growth rates, because the Western Man is not reproduced biologically, but rather discursively. However, from within the dominant knowledge system, the climate crisis is more easily thinkable in terms of overpopulation – if the problem is displaced onto surplus populations, then 'we' can keep living as we are. As Michelle Murphy aptly puts it: "is there any surprise that it remains easier to imagine doing something about population than ending capitalism?" (2018, 107).

Following Haraway's call to stay with the trouble, I continue to address the trouble of the universalised human in the third and final chapter. Here, in response to the question raised by Haraway's work – is it possible to untangle the concept of overpopulation from its troublesome origins? – I unpacked the concept 'population' itself, analysing its usage and function as a representation of a collective humanity. I found one origin story of the population concept in Michel Foucault's analysis of biopolitics, where he argues that population emerged in the eighteenth century as the subject of biopolitical governance, created through statistical measurements, averages, and demographic trends. The statistical and mathematical aspects of the population helps lend it an air of transparency and objectivity which conceals the fact that it, like other concepts, is an abstraction. In this role as an 'epistemic life form', population has been used as a variable in other models, such as in the notion of 'carrying capacity'. Carrying capacity is the idea that there exists a calculable upper limit to the population size in a designated area of land, and it has been used as a tool of governance, determining when policy interventions are needed to keep populations below that limit. More recently, the notion of carrying capacity has been used to argue that the Earth is overpopulated, and that the climate crises we see today are a result of overshooting the natural limits and thus causing land degradation. However, I drew from Nathan Sayre's analysis of the concept to argue that carrying capacity functions as a self-validating theory, or a tautology. Lastly, I

discussed how the concepts 'population' and 'carrying capacity' are used to designate 'surplus populations' – which are the populations that are exceeding carrying capacity and thus must be reduced or 'averted'? In answer to this question, I returned to Foucault's theory, wherein the concept population itself is imbued with racism. For Foucault, racism is a crucial function of the state as it enables the differential valuation of life into that which must live and that which must die. In order to ensure the safety of 'our' population, the 'other' must die. While Foucault did not go into much detail of who the 'other' is, I brought in the work of Carole McCann and Sylvia Wynter, who both discuss in different ways how the Western Man produces itself as the 'normal' human, thus designating all other modes of being as subhuman and 'killable'.

By looking at the creation of population as a statistical figure, and carrying capacity as a flawed calculation, I called attention to how numbers and statistics function to bolster the overpopulation debate with a veneer of transparency and objectivity while highlighting the problems with this calculus in human life. By turning human beings into numbers, easily added or subtracted from a total, individual lives and intra-human differences are glossed over. It becomes easier to argue that we need to remove billions from the global population when it is just a number. Furthermore, the construction of 'population' and 'carrying capacity' as neutral and objective concepts to think with conceals their ideological underpinnings as tools of racist and colonial governance, serving to further normalise Western Man as the only mode of being human. I therefore argue that the overpopulation argument cannot be removed from its context and turned into a feminist concern – it has been co-constituted by a system of knowledge that is fundamentally opposed to feminist politics.

The scope of this thesis was critical, unpacking the way the overpopulation concept frames the discussion of climate change. I have argued that we should no longer be thinking in terms of overpopulation, because the concept hinges on the idea of a universal humanity that can be thought against some definite planetary limit. Both of these ideas are abstractions that no longer serve us. I

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also cautioned against the use of 'population' as a concept because of the assumptions of universality in the statistically created population – if we are to have a decolonised and antiracist discussion of climate change, we must be able to take intra-human difference into account. Finally, I offer two possibilities for further research, one that would expand, deepen and strengthen the analysis in this thesis, and one that would build on this thesis and move beyond it.

This thesis, in particular the third chapter, is the start of a bigger conversation about the logic of counting, and how this can be linked to the problems of environmental change on a larger scale. Here I noted how the designation of so-called 'surplus populations' often follows racist patterns, but a further step in this research could look at how the history of racism and slavery is constitutive of the logic of counting itself. Katherine McKittrick's (2014, 2016) work on "the mathematics of black life", Kathryn Yusoff's (2018) work on the "calculative logic of inhuman materiality" (2018, 67), and Hortense Spillers' (2003) work on commodification and the human-as-property, could all strengthen this research. A promising anchor point for this future line of research is the fact that the very concept of carrying capacity emerged in the shipping industry, which was also key to the Middle Passage and the process through which enslaved peoples were made into object-commodities, into economic cargo. McKittrick writes, about the slave ships: "This is where we begin, this is where historic blackness comes from: the list, the breathless numbers, the absolutely economic, the mathematics of the unliving" (2014, 17). Considering also that the start of colonisation and slavery is one of the proposed start dates of the Anthropocene, here is productive grounds for further discussion.

Moving beyond the critical scope of this thesis, the next step would be to determine what concepts we should be using instead. Some thinkers have already begun this work. For example, Michelle Murphy proposes the term "alterlife" as a "project aimed at summoning new forms of humanity, not preserving the human that histories of deep violence have created" (2018, 116). Another option is to follow the lead of indigenous thinkers, who are already working outside of the

dominant knowledge system. I find the work of Bawaka Country et al. (2013, 2016) particularly intriguing, as they emphasise a grounded and situated human-environment co-becoming, positioning humans as part of the environment rather than imposing upon it. In this ontology of co-becoming, the calculation and weighing of lives that is inherent to the notion of 'carrying capacity' would be unthinkable.

The work of constructing alternatives to 'population' is a work aiming to decolonise epistemic habits and transform our ways of thinking. Ultimately, if we want a feminist, anti-racist and anti-colonial discussion of the environment, we must critically reevaluate intra-human and human-environment relations, building new ways of connecting with and understanding the world. What I have made clear in this thesis is that this work is not possible if we cling on to the problematisation of "too many" humans.

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