## Case

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### AT: Cap Good---Space Colonization

#### 1---Private sector won’t invest, and governments won’t fund colonization.

Konrad Szocik 19. University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science. 01/2019. “Should and Could Humans Go to Mars? Yes, but Not Now and Not in the near Future.” Futures, vol. 105, pp. 54–66.

6. Public opinion Public opinion is, at least in the near future, the main sponsor of space research and space exploration. Bertrand, Pirtle, and Tomblin, (2017) show that the public is interested in human mission to Mars. The most preferred space mission is a crew in orbit and a robot mission on Mars surface. In other words, public criteria is low risk and low cost. The German space agency follows public opinion and social interest because is focused on duty for society and oriented to social purposes as “climate change, mobility, communication and security” (Zypries, 2017). Politicians are prone to reduce space budgets or to not invest in long-term human settlement missions due to public opinion. Consequently, progress in space technology is still retarded. State of art in space transport means did not change qualitatively since the Space Race between the US and the Soviet Union. Impact of public opinion may differ in various countries. Max Grimard (2012), p. 6) shows how important is space program for public opinion in the US. Public sympathy for American presence in space is counterbalanced by the unpredictability of politician authorities, the tensions between presidents and the Congress (Grimard, 2012, p. 12), and the important role played by competition with Russia and China (Grimard, 2012, p. 6). Grimard adds that Russia is similar case but it is currently entire focused on stability of space programs, including renovation of old infrastructure than on new space exploration programs. According to Grimard (2012), p. 13), this fact excludes Russia from being the leader of international collaboration in space policy despite its historical advantages. China, according to Grimard, repeats space policies of the US and Soviet Union. By contrast, in Japan and Europe, prestige does not play role. Japan and Europe are focused on scientific and technological contexts. Space program is not a part of national policy. Due to its costs, politicians may decide to not risk negative approach of public opinion. But public opinion does not threaten private investors which can consider space as object of their investment. 7. Commercial exploration of space is not a workable alternative Risk of funding the wall might be avoided by commercial exploration of space (Crawford, 2016). According to Crawford, some space projects such as next generation of large telescopes or crewed mission to Mars are non-profitable. While they are a governmental duty, they could be funded partially by profits from commercial exploration of space (for instance, space mining). Hope for private exploration sounds reasonable but is counterbalanced by commercial focus on profits. Because mission to Mars has only scientific profits, only public sponsors will be invested in this project. James S. J. Schwartz (2014) adds that two of the possible reasons for human space mission, such as improving human welfare and progress in scientific exploration, are well beyond interests of private companies. Newman and Williamson (2018) quite similarly expect that private space exploration will be focused on financial profits more than on environmental sustainability. Private investors are not obliged to act altruistically and to sacrifice their business for uncertain idea. W. Henry Lambright (2017) adds that private companies at least at first stages of Mars space program will not be able to fund it. For this reason, Mars space program requires multi-generational effort and political stabilization. The challenge of safety works against private investors in space program. Public space agencies have achieved high standards of safety. They behave in careful and conservative ways. Commercial, private projects do not have the same advanced technology, the large number of scientists and support staff, and the generous budgets. Catastrophe would likely break a private space program. The lack of experience of private companies in space exploration is partially responsible for higher risk of technological failures even in relatively easy tasks as crash of Momo-2 rocket launched by Japanese start-up on 30 June 2018 several seconds after launch. This does not mean that private investors are not able to explore space, but they are able to do that only when they receive profits. In scenario of commercial exploration of space, we should wait for some point in the future when a human space base appears as byproduct of commercial activity. A human base on Mars might be a by-product of hotels on LEO or space mining. Some investors who want to build space hotels may try to settle space regions beyond LEO and build hotels on the Moon and/or Mars. From touristic point of view, staying in the Moon or Mars hotel may be more attractive than on LEO. Investors working in asteroid mining may extend their business to the Moon and/or Mars. Both enterprises even if focused on purely commercial purposes, will not be easy (perhaps impossible) to achieve by private companies alone. Elvis (2012), p. 549) argues that asteroid mining will be challenging due to, among others, difficulties in detection of appropriate asteroids. He shows that among about 1200 analyzed meteorites only 13 of them contain high level of platinum profitable for their exploitation. Elvis suggests that NASA should reorient its strategy from focus on exploration to support for commercial utilization of space. Exploration will appear as a consequence of commercial profitable activity (Elvis, 2012, p. 549). Estimated profits of asteroid mining10 are counterbalanced by high costs of exploitation and possible decreasing of price of currently rare resources (Genta, 2014).11

#### 2---Any colony would be dependent on earth for resources---human society is too complex to survive without support.

Adam Morton 18. Visiting Emeritus Professor of Philosophy at the University of British Columbia. 10/15/2018. “Three: Problems with Colonies” Should We Colonize Other Planets?, John Wiley & Sons.

Worries about refuges To be refuges where humans can survive catastrophe on Earth, colonies on other planets must of course contain and sustain humans. That is the point. They must also be highly technological: surviving in an environment less hospitable than anywhere on Earth would need powerful resources. Mars does not have an atmosphere that we can breathe, does not support plants that we can eat, is very cold, has little usable water, and receives much less solar energy. It is hard to make an analogy with anywhere on Earth: combine the light levels of the deep ocean with the cold of the Antarctic, add radiation, and then exaggerate. (The pictures from the Martian Rovers are accurate as far as colour and illumination go, but we tend to project familiarity onto them, taking the atmosphere to be like air on Earth and reading the absence of snow and ice as warmth rather than the frozen desert that it really is. I know this is my own tendency until I catch myself.) The colony must from early on produce all its own food, water, and oxygen. This is not at all impossible, given sophisticated equipment, which has been tried out under desert and arctic conditions on Earth. But these conditions are not really that much like Mars, especially with respect to cold, dark, and radiation. The equipment must continue to function, indefinitely. So it must be possible to repair it without using supplies brought from Earth. So, until local manufacturing can take over, repair equipment and spare parts must be added to the list of things that must be sent with the colonists in the first place. And, easy to overlook, it adds to the number of people who must be sent. A modern technological society of a kind that can create and repair the kind of equipment we are talking about involves thousands of specialized skills. Some combinations of these can be compressed into a smaller number of people, but many are still needed. Robinson Crusoe would not last long on Mars. Questions about the number of people in a colony are crucial. Selfsufficiency requires a large number of people – say several hundred at the least. And long-term survival requires genetic diversity. If population sizes are too small, then inbreeding makes hereditary defects and infectious diseases more common. Moreover, with a small population size, random fluctuations can result in imbalanced numbers of males and females, leading to both a smaller number in the following generation and yet more reduced diversity. (A shortage of females is obviously more serious. A bias towards females would have obvious advantages. Perhaps in fact an ideal colony should be all female plus a genetically diverse sperm bank.) It has been estimated that in wild quadrupeds a population size of 500 to 1,000 is needed for long-term survival of a species, while the crews for the simulated Mars habitats on Earth have typically had six people! Humans already have a very low genetic diversity: pairs of chimpanzees in the same troops have on average more genetic diversity than pairs of humans on Earth. The crews would have to be carefully chosen. A very special psychological makeup is needed. Crew members must endure close quarters with a small number of others, a very basic life, the knowledge that one has left one's family and friends behind, and a high risk of death. They must also be chosen so that there is a range of technical knowledge, improvisational skills, and the emotional and cultural makeup needed for something like Earth civilization to continue. And this must reproduce itself for generations. It is unlikely that, even if an optimum mix of people were achieved in the initial crew, the same mix would be preserved in subsequent generations. This too argues for larger population sizes. But the more people there are, the greater the expense and resources needed to establish the colony in the first place. A disturbing fact about the production of food on Mars has recently emerged. The soil on Mars is rich in compounds called perchlorates. They react with ultraviolet light, to which the Martian atmosphere is largely transparent, in a way that is fatal to many cells. There is thus a lot of doubt whether plant crops, and the symbiotic bacteria that many of them need, can survive in Martian soil. This complicates ambitions for indoor farming considerably. Because of the effects on both living cells and human health, perchlorate contamination is regarded as pollution on Earth. Perchlorates also have a risk of explosion when they are heated, complicating plans to produce oxygen by heating the Martian soil. They are, however, a source of oxygen and of other basic chemicals; although dangerous they could have their uses. There are surely high-tech solutions to this problem, but equally surely they raise the stakes for transport and technology and increase the danger. The complexity of technological society There is a fundamental fact behind many of these problems: the large scale and interdependence of our society, with its complex web of manufacturing techniques and expertise held in the minds of many people. It is extremely hard to duplicate this in a small population with restricted resources, especially in a hostile and unfamiliar environment. So dependence on the mother culture is hard to avoid. (This was true in the past, also. The early European colonies in North America did not make their own muskets until they had grown quite large, and European agricultural styles took a lot of adapting. This may not seem advanced technology. But could you make a musket? For that matter, could you make a stone axe?) This means that the high-tech devices needed to survive in the Martian environment are not going to be designed there. The designs are going to come from home. And it is likely that at least a proportion of the devices themselves will also. 3D printing from transmitted designs may solve some problems, though, if the raw materials can be obtained and refined on Mars. (I would imagine that supplies of direct and indirect biological material, such as the petroleum and oil products that are used to make plastics, might pose a serious problem.) If imported equipment is unsuitable or does not work because of some unexpected quirk of the faraway environment, much of it will have to be redesigned and manufactured not where it is needed but where the techniques and expertise are to be found. The more advanced the apparatus (the higher the tech), the more will need to be transported to the colony, adding to the transport costs and creating a need for spares. For all these reasons I am extremely sceptical that a colony of the size that we could send to Mars in the next decades, perhaps in the next century, could sustain itself without frequent supplies and reinforcements from Earth. The obvious reply to this is to drop the requirement that the colony be able to survive without the supplies and reinforcements. But this would undercut one of the main purposes – that of providing a remnant of humanity on Mars with a reasonable chance of surviving an earthly catastrophe. The colony would then be a scientific expedition and the beginning of a preparatory project that might take centuries.

#### 3---Scientifically impossible.

Sukant Khurana 18. Khurana runs an academic research lab and several tech companies. 6-2-2018. "The prospect of escaping earth due to depletion of resources." Medium. https://medium.com/@sukantkhurana/the-prospect-of-escaping-earth-due-to-depletion-of-resources-e5bc92d477f0

Atmosphere Creating a breathable atmosphere is one of the first conditions of building a space settlement. Most of the planets such as Mars (95.2% CO2 and only 0.13% O2 ) [3] possesses a hostile atmosphere for human habitation. Also, the atmospheric pressure is way lower than Earth (At mean radius, Mars has an average atmospheric pressure of 0.058 psi-0.126 psi [3] where on Earth, the mean pressure at sea level is 14.6959 psi ) in most of them. The other concern related to the atmosphere is the freezing cold temperatures in our prospective colonies. Most of them do not have a proper atmosphere to contain the solar energy and some are simply far from the sun. The Martian temperature can reach anything between -60 to -65 degree Celsius [4] and this figure simply go down as we move further from the Sun. Health concerns Another big issue for us can be the difference in gravity in our prospective home. Mars for an example has a surface gravity of 3.69 m/s2 [3], only 37.9 % of Earth’s surface gravity. Such low gravity can have serious effects on the colonists. It may cause osteoporosis and cardiovascular diseases and can even lead to significant decrease of grey matter volume in our brain [5]. Radiation is another threat for a budding colony outside Earth. Planets or moons which do not have a magnetic shield like Earth, can expose the colonists to harmful radiations. Such exposers can lead to serious cognitive disabilities and may affect the fertility of the colonists. Other serious consequences include cardiovascular damages and cancer. For a Mars Mission, the standard risk of exposure induced death in astronauts can jump from 3% to 10% while the chance of morbidity becomes as high as 20% [6]. Severe psychological issues may also develop among the colonist thanks to the isolation they may experience in the early days of the colony. An interesting read in this regard is the article on the mental preparation for mars by Sadie E. Dingfelder. Economical Feasibility To set up a space colony we require a huge initial investment to cover the expenses to set up such a facility millions of miles away. Given the costs of a traditional launch and the amount of payload we need to transfer, it is almost impossible for a government to fund such an attempt without breaking the bank. A hope in this regard can be the recent developments of low-cost crafts such as the SpaceX Falcon 9 but they are still far from what is required to sustain such an ambitious effort. Conclusion From what we have discussed so far, it is clear that even if space colonization can be a solution for the survival of humankind, we are still far away from making it possible due to several factors. Hopefully, with the brilliant minds working in this sector, the day is not far when we will be harness to harness such technologies that will make our voyage towards our new home safer and cheaper. Till then, all we can do it is to try our best to protect and manage our resources so that the future generations can have a better place to live in.

### AT: Cap Good/Sustainable T/L

**2 --- cybernetic capitalism is terminally unsustainable – automation, cyclical shock, and inequality make social unrest inevitable and stifle innovation – turns all their cap good warrants – the only option forward is to remain deluded by the promise of capitalism’s perpetuity or to take the plunge**

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Some seven years after the onset of the great recession the immediate high tide of revolt had ebbed. Global economic recovery was uneven and fitful. The extreme levels of unemployment widespread at the height of the crisis slowly subsided in some areas, including the US, though hardly at all in others. Under-employment and insecurity, or precarity, continued almost everywhere: a 2013 Gallup Poll investigation, based on 136,000 interviews in 136 countries shows that only one in four adults worldwide, or roughly 1.3 billion people, worked full time (defined as 30 or more hours a week) for an employer. The percentage of full time jobs varied from 43 percent in North America to 19 percent in the Middle East and North Africa and 11 percent in Sub-Saharan Africa. In all of these regions, much part time work was involuntary (Clifton and Ryan, 2014). Class divisions continued to intensify. As the Economist (2011a) observed: Globally, the rise of many people out of poverty has reduced income inequality, though many people in informal and illegal work have not benefited. But within most countries inequality . . . has increased in recent decades. In most countries inequality seems bound to keep growing. In North America and Europe, austerity regimes continued to press down on wages, public service workers and welfare provisions. Debt crises persisted from Greece to Puerto Rico. Capital’s accumulation and ejection of proletarians proceeded at yet higher cybernetic intensities, often in ways spurred by the revolt. Following the Foxconn worker suicides, Terry Gou, chief executive of the company, announced a plan to “hire” one million robots. As the Economist (2011b) observed “[r]obots are easier to manage”; they “don’t complain. Or demand higher wages, or kill themselves”. Gou’s plan has faced difficulties, but as wage rates rose Chinese companies more generally started to automate intensively (Durfee, 2012). US corporations, faced with rising off-shore labor costs, planned on ‘repatriating’ jobs, to be performed by new adept robot systems drawing on military research from the 9/11 wars (Markoff, 2012). At the same time, a new wave of algorithmic expert systems threatened not only routinized jobs, such as those of call centre operatives, but also the ‘white collar’ tasks of pharmacists, legal professionals, laboratory technicians and journalists, previously considered immune to automation (Steiner, 2012; Brynjolfsson and McAfee, 2014). Meanwhile, cybernetic capital continued globally scoping-out and scooping-in cheapened labor power. Supply chains were rendered yet more sinuous and scale-able by crowdsourcing and by using software to “carve a given task into microscopically small pieces” for digital execution at minimal Dyer-Witheford 51 skill levels (Stross, 2010). Such techniques were extended to the huge labor pools of low-income countries via mobile phone to become the new horizon of cybernetic piece work. In the advanced zones, Silicon Valley enterprises push to break down employment in regulated industries into software-coordinated micro-businesses through ventures such as Uber and Air B&B. Coming in the wake of the 2008 crisis, these activities were characteristically dressed with a revolutionary rhetoric of freedom, cooperation, and equalitarianism, promising ‘user empowerment’, ‘digital socialism’ or a ‘sharing economy’. Meanwhile their underlying reality was the lowering of wages, unmonitored work conditions and more precarity (Morozov, 2015). The high frontier of cybernetic innovation continued in a financial sector now run in almost human-free mode by algorithmic high frequency trading (HFT) programs operating near light speed (Seymour, 2011; Patterson, 2012; Toscano, 2013). The most dramatic demonstration of this activity came in the algorithmically induced “Flash Crash” of May 6, 2010. The Dow Jones Industrial Average fell 600 points in five minutes, the biggest one-day decline in its history. High frequency trading (HFT) is considered most advanced in derivatives markets. Their size is extremely difficult to measure, but is almost certainly now larger than before the 2008 crash and may be as much as 14 times bigger than world annual GDP (Sivy, 2013; Economist, 2013b). From capital’s point of view, this scale of operations inverts the conventional distinction between ‘real’ and ‘fictitious’ economies. The brief global synchronization of struggles apparent in the digital cascade of 2011 had broken up. On a more regional and national basis, however, experiments in political recomposition, including cybernetic re-appropriations, continued. In North America the impetus of Occupy, including its digital tactics, flowed into initiatives such as: the collective eco-disaster relief of Occupy Sandy; a student debt-strike; living wage campaigns; campus strikes by teaching assistants and contract instructors; and unionization drives in digital industries. In Ferguson, Baltimore and elsewhere, uprisings against the violence of racist policing were riots of the excluded driven by digital surveillance, live streaming of demonstrations, and social media solidarities including the broader protest forms of Black Lives Matter. Networks of alternative news and online publications provided a diaphanous connection amongst all these outbreaks, and social forum and common front projects attempted to knit them more closely together. However, they faced intractable problems of crosssegmentary cooperation and coordination. The collective weapon of synthesizing occupations, assemblies, strikes, blockades, and hacktivism around a core of common goals seemed at once very necessary, tantalizing close but as yet unrealizable An answer to these problems seemed to some to be promised by the revival of electoral antiausterity politics in Europe, with the emergence of new parliamentary parties such as Syriza in Greece and Podemos in Spain. These parties were created by activists from the 2011 cycle of struggle. Podemos in particular adapted the digital techniques of assembly movements to the building of a more durable organization, for example through the creation of digital ‘circles’ as organizational components (Tenhunen and Rodriguez, 2014). These initiatives raised many hopes amongst those disappointed by short-lived occupation movements. However, the capitulation inflicted on Syriza in its 2015 negotiations with Euro-bankers showed the limits of reformist strategies. To make real gains such electoral efforts would require radical militant base organization capable of propelling them to rupture with capital’s elites and sustaining the consequent social conflict.

#### 3 --- Their data is cooked – the west is responsible for by far the majority of emissions, land grabbing, ocean grabbing and climate debt – irreversible warming inevitable by 2035 – squo preparation is priming the US military to establish Fortress America – causes invasions across the globe to secure resources and shore up hegemony

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Although China is often designated as the country with the largest material footprint, drawing on the resources of the entire world, the picture that this conveys is false, given that China is by far and away a net exporter of primary materials in embodied (material footprint) terms. Such a development pattern, associated with global South countries generally, leaves these nation-states with outsized ecological costs while, in consumption terms, the benefits of the natural resources go mainly to the rich countries under conditions dominated by unequal ecological exchange.16

If ecological plunder has occurred over centuries through various modes of expropriation and exploitation imposed directly on colonies and neocolonies in the global South, the effects of ecological imperialism are also evident in relation to the global commons, that is, in the oceans and the atmosphere. Since the passage of the 1982 Law of the Sea, nearly half of the world’s ocean falls under the jurisdiction of nation-states, mostly within “exclusive economic zones.” Eighty-three countries, most of them small island nations, but also larger states like the United Kingdom and the United States, now have more ocean than land in their territorial jurisdictions. This has facilitated the expropriation of ocean resources. It has also given dominance in this realm to the leading imperialist nations, which have the capital and technology to plunder these resources. These core nations are also frequently able to seize control from and take advantage of peripheral states, particularly with the economic leverage provided by states’ increasing introduction of privatization regimes of ocean management. The result in recent years has been what is known as ocean grabbing, shutting out small nations and small fishers, and allowing multinational corporations to move in and overexploit both fisheries and seabed resources. Meanwhile, the International Seabed Authority allows states and corporations to exploit, for their own benefit, oil, natural gas, minerals, and precious metals in and under the seabed in international waters, despite the fact that these are ocean commons.17

As United Nations Special Rapporteur on the Right to Food, Olivier de Schutter, declared in 2012, “‘ocean-grabbing’—in the shape of shady access agreements that harm small-scale fishers…and the diversion of resources away from local populations—can be as serious a threat as ‘land-grabbing.'”18 Ocean grabbing is thus a process of enclosing the ocean commons. The Transnational Institute in 2012 determined that “large-scale fleets operating in territorial marine zones ‘capture’ resources from local fishers and the entire chain of people who rely on traditional fishing activities. The European Union’s (EU) fishing agreements with Morocco, Mauritius, Mauritania and Pacific Island States, for example, are fostering this kind of dispossession.”19 Global fishing fleets have doubled their capacity to 3.5 million vessels since the 1970s, but the 1 percent of these that are industrial ships account for up to 60 percent of the seafood catch. Small island countries often get a mere pittance for the sale of their fishing rights to international fleets.20

What is sometimes called the atmospheric commons reveals the historical consequences of imperialism in an entirely different way. Anthropogenic climate change induced mainly by cumulative carbon dioxide emissions since the Industrial Revolution has compelled the world community to adopt an implicit climate budget based on limits on carbon emissions, determined by maximum acceptable levels of carbon concentration in the atmosphere. This means finding a way to get back down to 350 parts per million (ppm) from the present 414 ppm of carbon dioxide concentration in the atmosphere, while staying at all costs below 450 ppm. The goal is to limit the increase in global average temperature over preindustrial levels to 1.5ºC—with a 2ºC increase (corresponding to 450 ppm) representing the final guardrail, beyond which climate change is likely to spin irreversibly out of control. In accordance with these parameters, the Intergovernmental Panel on Climate Change has recently called for net zero carbon emissions by 2050, which would give at least a 50 percent chance of limiting the increase of global average temperatures to 1.5ºC.

At present, more than 60 percent of the allowable carbon under this budget—if the world is merely to seek to stay below a 2ºC increase in global average temperature (equivalent to 450 ppm)—has been emitted to the atmosphere. Today’s business as usual puts the world on a trajectory to hit the trillionth metric ton of carbon, reaching the 2ºC boundary—marking irreversible climate change—in 2035.21 Carbon dioxide emissions are cumulative, so what matters is the amount that each country or region has contributed. The United States, Canada, Europe (and Eurasia), Japan, and Australia have together contributed around 61 percent of the total, as compared to 13 percent for China and India taken together. Russia accounts for another 7 percent, and world ship and air transport are 4 percent. The entire rest of the globe accounts for 15 percent of cumulative emissions. These disparities are only increased if consumption-based rather than production-based emissions are used.22

From the viewpoint of the global South, this means that the atmospheric space for the use of fossil fuels for their own development has already been taken up by the imperialist countries and very little remains for South countries to develop their own economies. In principle, the United Nations Climate Convention under the Kyoto Protocol had given much greater responsibility to wealthy countries to reduce carbon dioxide emissions, stipulating that the Annex I countries would drastically cut their emissions ahead of developing countries with fewer cumulative emissions.23 Yet, U.S. emissions per capita have remained at about three times the global mean and its overall emissions continue to increase. Calculating the per capita shares of cumulative carbon dioxide emissions in 2012, the core capitalist countries had already exceeded their fair share by 568 billion metric tons, creating an enormous carbon debt or obligation to underdeveloped countries.24

Although the poles are warming faster than the low latitude regions of the globe, the effects at the mid– to low latitudes, especially dry regions, can be very severe. Global warming is hitting the hotter, low latitude, tropical and subtropical regions of the earth especially hard. Many low latitude countries are facing temperature increases that threaten to make them unlivable. Earth System conditions thus determine which global regions are most affected geophysically by climate change, with countries in the tropics and subtropics initially more vulnerable. Thus, one crucial study in Environmental Research Letters in 2011 declared: “Those countries affected most by the warming are not the ones that are most responsible for it. The fact that locally significant warming emerges first in [low latitude] countries with low emissions has no underlying economic or societal cause.”25 As stated by climatologists James Hansen and Makiko Sato, “temperature rise itself imposes a strong disproportionately large effect on low latitude countries.… Business-as-usual fossil fuel emissions result in some regions in the Middle East becoming practically uninhabitable by the end of the century.” The subtropics are particularly vulnerable to drought intensification. In contrast, countries located at higher latitudes, which are generally wealthier, while affected by climate change-induced increases in storm intensity, droughts, and heat waves, may in some cases actually find their average temperatures moving more toward the global optimum.26

But if countries in hotter, low latitude regions are affected disproportionately by global warming, this is only made far worse by the fact that these countries are also generally poorer, which is the result of social-historical causes. One effect of climate change is therefore to exacerbate already existing global inequalities. The absolutely catastrophic effects of climate change are therefore expected to emerge first in the South. The North too is threatened, but, at least initially, to a lesser extent, due to both environmental and social factors. An analysis in Nature provided a benchmark estimate in which “average income in the poorest 40% of countries declines by 75% by 2100 relative to a world without climate change, while the richest 20% experience slight gains, since they are generally cooler.”27 Although the numbers might be questioned, the divergence in trends is obvious.

This divergence in fates between the global North and South, strongly impacted by the imperialist dimensions of the metabolic rift, is already making itself felt. An article by Noah S. Diffenbaugh and Marshall Burke, “Global Warming Has Increased Economic Inequality,” in the Proceedings of the National Academy of Sciences, May 14, 2019, indicated that “there is growing evidence that poorer countries or individuals are more negatively affected by a changing climate, either because they lack the resources for climate protection or because they tend to reside in warmer regions where additional warming would be detrimental to both productivity and health.” The combination of environmental and social factors suggests that there are some “warming-induced penalties in poor countries, along with warming-induced benefits in some rich countries.”28 The complexity of climate conditions, and the multiplicity of dangers attending abrupt climate change, suggest that while poor countries in the South will experience catastrophic effects, the threats to the countries in the North are by no means negligible. Still, the most important factor in determining differential outcomes is undoubtedly the social one, related to the greater wealth and hence access to resources of the North.

Other climate change factors also point to greater impact in the global South than the North. Small island developing states, thirty-seven of which are members of the United Nations and another fifteen of which are classified as mere territories, are all endangered by sea-level rise, as are low-lying and often densely populated coastal nations such as Bangladesh and Vietnam.29 The loss of “water towers” associated with mountain glaciers and headwaters that behave as reservoirs, storing water during winter and releasing it slowly in the summer, will have the greatest impact in the Indian subcontinent and China where as many as a billion or more people may have their water supply diminished by the melting of the Himalayan glaciers.30 Climate change could disrupt the monsoons with enormous, but unpredictable, consequences. Tropical forests with their great diversity of life and their importance for regional and global climate stability are especially vulnerable to warming.

Given the reality of imperialism, the main response by the economic and military power structures in the North to this climate rift, pointing to more serious vulnerabilities to climate change in the global South than in the global North, has been mainly twofold: (1) to explore how these vulnerabilities in the South create new global security issues, and (2) how they might be exploited so as to increase imperial dominance. This is most obvious in the case of the United States, where the new grand strategy of the Donald Trump administration is one of global “energy dominance” through the expansion of fossil fuel production and the use of this to leverage greater geopolitical and geoeconomic power.31 The U.S. military, meanwhile, is preparing for a host of new vulnerabilities, related in particular to oil and water, and for interventions to secure U.S. global hegemony in these changing circumstances. Economic and military interests are working together to strategize means for securing global value and resource chains, so as both to strengthen Fortress America and secure its supply lines—working as well with its junior partners in the triad, Europe and Japan. This strategic repositioning of imperialism in the Anthropocene can best be seen by examining the race for control of natural resources in two areas: fossil fuels and water.