# 1AC

#### Appropriation:

**Gorove 1969** [Stephen Gorove, Chairman of the Graduate Program of the School of Law and Professor of Law University of Mississippi School of Law , 1969, “Interpreting Article II of the Outer Space Treat”, Fordham Lw Review Volume 37 Issue 3, <https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1966&context=flr> ] // Triumph Debate

With respect to the concept of appropriation **the** basic **question is what constitutes "appropriation,"** **as used in the Treaty, especially in contradistinction to casual or temporary use.** **The term "appropriation" is used most frequently to denote the taking of property for one's own or exclusive use with a sense of permanence.** **Under such interpretation the establishment of a permanent settlement or the carrying out of commercial activities** by nationals of a country on a celestial body may **constitute** national **appropriation** if the activities take place under the supreme authority (sovereignty) of the state. Short of this, if the state wields no exclusive authority or jurisdiction in relation to the area in question, the answer would seem to be in the negative, unless, the nationals also use their individual appropriations as cover-ups for their state's activities.5 In this connection, it should be emphasized that **the word "appropriation" indicates a taking which involves something more than just a casual use.** Thus a temporary occupation of a landing site or other area, just like the temporary or nonexclusive use of property, would not constitute appropriation. By the same token, **any use involving consumption or taking with intention of keeping for one's own exclusive use would amount to appropriation.**

**Just:**

**1 – Interpretation: The Term just indicates an ethical statement – this means even if we win a small action of the Neg that is unjust, its an auto aff ballot**

**Definition of Justice:**

“Just English Definition and Meaning .” **Lexico Dictionaries** | English, Oxford University , https://www.lexico.com/en/definition/just.

Based on or behaving according to what is morally right and fair.

Based on this definition… the framing is as follows:

**Outer Space:**

**https://languages.oup.com/google-dictionary-en/ Oxford Languages**

the physical universe beyond the earth's atmosphere.

### Framework

1. **Reducing structural violence is the most just action. We are promoting fairness and thus justice by reducing inequality against marginalized populations.**
2. **Addressing structural violence is a prerequisite to addressing other impacts – it is embedded into the framework of society.**

**Attempts to prioritize existential threats distorts our moral reasoning and ensures we will continue to ignore urgent structures of violence – overcorrect to resolve ongoing wrongs and refuse to be ethically blackmailed by the threat of large scale future impacts..**

**Olson ‘15** – prof of geography @ UNC Chapel Hill (Elizabeth, ‘Geography and Ethics I: Waiting and Urgency,’ Progress in Human Geography, vol. 39 no. 4, pp. 517-526)//Ak//recut

III The body and the emergency Though the body is often presumed to be the most basic unit where urgency might be detected, only some dictionaries link urgency and the body through a ‘medical’ reference to the compelling need to defecate or urinate.5 Focusing on the different meanings of urgency runs the risk of obscuring language categories, but pushing together the two definitions – urgency as the need to defecate and urinate, and urgency as overwhelming force – is useful here, because my aim is to illustrate that the ethical work of urgency has been hijacked by an hierarchical organization of scales of moral deliberation. Specifically, our research suggests that the urgent body is cast as subjective and impulsive, while larger scales, such as the region, state or society, emerge as the scale of a rational ethics. While these are not new arguments about states (Scott, 1998) and their institutions (Foucault, 1995), geographic insights into toileting and securitizations suggest that **technocratic practices both require and perpetuate an ethical distinction between the body and the large-scale future event**, **with the latter emerging as the only legitimate site of urgent claims and thus the dominant subject of moral reasoning**.In research related to contemporary global toileting, the defecating body’s status as a legitimate ethical concern is more likely to be acknowledged when **threatening the sanitation aims of cities and states**. This is perhaps most evident in large metropolitan areas where uneven access to toilets amplifies social inequalities and human suffering (McFarlane, 2013). Jewitt’s (2011) examination of waste management in India and other countries in the Global South reveals that taboos around feces often justify inequality in two ways; first, by creating conditions of precarity through taboos in discussing personal sanitation and toilet practices, and second, by justifying social exclusion on the basis of inferior sanitation practices. The lack of access to sanitation infrastructure can also provide reasons for excluding informally settled populations from ambitiously modernizing cities. In cities like Kampala, Uganda, planners, development workers, and community organizers frame those who cannot use modern toilet facilities as threatening (Terreni-Brown, 2014a). Terreni-Brown (2014b) describes a group of female migrants selling goods outside of a large, upscale mall in Kampala, and their strategies for balancing the lack of access to a toilet with the danger and humiliation of going in the area behind their street-side location. Their desperate pain, induced by waiting hours until they can finally return to a more private location, contrasts with complaints of city planners and NGO workers who point to moral lethargy in the informal settlements that puts the city at risk. The poor, illegal, marginalized body is not a reasonable scale of urgency, nor is it the product of a thoughtful weighing of circumstances; in the face of a morally rational prioritization of a future Kampala, these bodily urgencies literally have no place in the modern city. Though toileting might be thought of as a special case of bodily urgency, geographic research suggests that the body is increasingly set at odds with larger scale ethical concerns, especially **large-scale future events of forecasted suffering**. Emergency planning is a particularly good example in which the large-scale threats of future suffering can **distort moral reasoning**. Žižek (2006) lightly develops this point in the context of the war on terror, where in the presence of fictitious and real ticking clocks and warning systems, the urgent body must be **bypassed** because there are **bigger scales to worry about**:¶ What does this all-pervasive sense of urgency mean ethically? The pressure of events is so overbearing, the stakes are so high, that they necessitate a suspension of ordinary ethical concerns. After all, displaying moral qualms when the lives of millions are at stake plays into the hands of the enemy. (Žižek, 2006)¶ In the presence of large-scale future emergency, the urgency to secure the state, the citizenry, the economy, or the climate creates new scales and new temporal orders of response (see Anderson, 2010; Baldwin, 2012; Dalby, 2013; Morrissey, 2012), many of which treat the urgent body as impulsive and thus requiring management. McDonald’s (2013) analysis of three interconnected discourses of ‘climate security’ illustrates how bodily urgency in climate change is also recast as a menacing impulse that might require exclusion from moral reckoning. The logics of climate security, especially those related to national security, ‘can encourage perverse political responses that not only fail to respond effectively to climate change but may present victims of it as a threat’ (McDonald, 2013: 49). **Bodies that are currently suffering cannot be urgent**, because they are **excluded from the potential collectivity** that could be **suffering everywhere in some future time**. Similar bypassing of existing bodily urgency is echoed in writing about violent securitization, such as drone warfare (Shaw and Akhter, 2012), and also in **intimate scales** like the street and the school, especially in relation to race (Mitchell, 2009; Young et al., 2014).¶ As **large-scale urgent concerns are institutionalized**, the urgent body is increasingly **obscured through technical planning and coordination** (Anderson and Adey, 2012). The predominant characteristic of this institutionalization of large-scale emergency is a ‘**built-in bias for action’** (Wuthnow, 2010: 212) **that circumvents contingencies**. The urgent body is at best an assumed eventuality, one that will likely require another state of waiting, such as **triage** (e.g. Greatbach et al., 2005). Amin (2013) cautions that in much of the West, governmental need to provide evidence of laissez-faire governing on the one hand, and assurance of strength in facing a threatening future on the other, produces ‘just-in-case preparedness’ (Amin, 2013: 151) of neoliberal risk management policies. In the US, ‘personal ingenuity’ is built into emergency response at the expense of the poor and vulnerable for whom ‘[t]he difference between abjection and bearable survival’ (Amin, 2013: 153) will not be determined by emergency planning, but in the material infrastructure of the city.¶ In short, the urgencies of the body provide justifications for social exclusion of the most marginalized based on impulse and perceived threat, while **large-scale future emergencies effectively absorb the deliberative power of urgency into the institutions of preparedness and risk avoidance**. Žižek references Arendt’s (2006) analysis of the banality of evil to explain the current state of ethical reasoning under the war on terror, noting that people who perform morally reprehensible actions under the conditions of urgency assume a ‘tragic-ethic grandeur’ (Žižek, 2006) by sacrificing their own morality for the good of the state. But his analysis fails to note that bodies are today so rarely legitimate sites for claiming urgency. In the context of the **assumed priority of the large-scale future emergency**, the urgent body becomes **literally nonsense, a non sequitur** within societies, states and worlds that will **always be more urgent**.¶ If the important ethical work of urgency has been to identify that which must not wait, then the capture of the power and persuasiveness of urgency by large-scale future emergencies has consequences for the kinds of normative arguments we can raise on behalf of urgent bodies. How, then, might waiting compare as a normative description and critique in our own urgent time? Waiting can be categorized according to its purpose or outcome (see Corbridge, 2004; Gray, 2011), but it also modifies the place of the individual in society and her importance. As Ramdas (2012: 834) writes, ‘waiting … produces hierarchies which segregate people and places into those which matter and those which do not’. The segregation of waiting might produce effects that counteract suffering, however, and Jeffery (2008: 957) explains that though the ‘politics of waiting’ can be repressive, it can also engender creative political engagement. In his research with educated unemployed Jat youth who spend days and years waiting for desired employment, Jeffery finds that ‘the temporal suffering and sense of ambivalence experienced by young men can generate cultural and political experiments that, in turn, have marked social and spatial effects’ (Jeffery, 2010: 186). Though this is not the same as claiming normative neutrality for waiting, it does suggest that waiting is more ethically ambivalent and open than urgency.¶ In other contexts, however, our descriptions of waiting indicate a strong condemnation of its effects upon the subjects of study. Waiting can demobilize radical reform, **depoliticizing ‘the insurrectionary possibilities of the present by delaying the revolutionary imperative to a future moment that is forever drifting towards infinity’** (Springer, 2014: 407). Yonucu’s (2011) analysis of the self-destructive activities of disrespected working-class youth in Istanbul suggests that this sense of infinite waiting can lead not only to depoliticization, but also to a disbelief in the possibility of a future self of any value. Waiting, like urgency, can **undermine the possibility of self-care** two-fold, first by making people wait for essential needs, and again by reinforcing that waiting is ‘[s]omething to be ashamed of because it may be noted or taken as evidence of indolence or low status, seen as a symptom of rejection or a signal to exclude’ (Bauman, 2004: 109). This is why Auyero (2012) suggests that waiting creates an ideal state subject, providing ‘temporal processes in and through which political subordination is produced’ (Auyero, 2012: loc. 90; see also Secor, 2007). Furthermore, Auyero notes, it is not only political subordination, but the subjective effect of waiting that secures domination, as citizens and non-citizens find themselves ‘waiting hopefully and then frustratedly for others to make decisions, and in effect surrendering to the authority of others’ (Auyero, 2012: loc. 123).¶ Waiting can therefore function as a potentially important spatial technology of the elite and powerful, mobilized not only for the purpose of **governing individuals**, but also to **retain claims over moral urgency**. But there is **growing resistance** to the capture of claims of urgency by the elite, and it is important to note that even in cases where the material conditions of containment are currently impenetrable, arguments based on human value are at the forefront of **reclaiming urgency for the body**. In **detention centers, clandestine prisons, state borders and refugee camps**, geographers point to ongoing struggles against the ethical impossibility of bodily urgency and a rejection of states of waiting (see Conlon, 2011; Darling, 2009, 2011; Garmany, 2012; Mountz et al., 2013; Schuster, 2011). Ramakrishnan’s (2014) analysis of a Delhi resettlement colony and Shewly’s (2013) discussion of the enclave between India and Bangladesh describe people who refuse to give up their own status as legitimately urgent, even in the context of larger scale politics. Similarly, Tyler’s (2013) account of desperate female detainees stripping off their clothes to expose their humanness and suffering in the Yarl’s Wood Immigration Removal Centre in the UK suggests that demands for recognition are not just about politics, but also about the acknowledgement of humanness and the irrevocable possibility of being that which cannot wait. The continued existence of places like Yarl’s Wood and similar institutions in the USA nonetheless points to the challenge of exposing the urgent body as a moral priority when it is so easily hidden from view, and also reminds us that our research can help to explain the relationships between normative dimensions and the political and social conditions of struggle.¶ In closing, geographic depictions of waiting do seem to evocatively describe otherwise obscured suffering (e.g. Bennett, 2011), but it is striking how rarely these descriptions also use the language of urgency. Given the discussion above, what might be accomplished – and risked – by incorporating urgency more overtly and deliberately into our discussions of waiting, surplus and abandoned bodies? Urgency can clarify the implicit but understated ethical consequences and normativity associated with waiting, and encourage explicit discussion about harmful suffering. Waiting can be productive or unproductive for radical praxis, but urgency compels and requires response. Geographers could be instrumental in reclaiming the ethical work of urgency in ways that leave it open for critique, clarifying common spatial misunderstandings and representations. There is good reason to be thoughtful in this process, since moral outrage towards inhumanity can itself obscure differentiated experiences of being human, dividing up ‘those for whom we feel urgent unreasoned concern and those whose lives and deaths simply do not touch us, or do not appear as lives at all’ (Butler, 2009: 50). But when the urgent body is rendered as only waiting, both materially and discursively, it is just as easily cast as impulsive, disgusting, animalistic (see also McKittrick, 2006). Feminist theory insists that the urgent body, whose encounters of violence are ‘usually framed as **private, apolitical and mundane’** (Pain, 2014: 8), are as deeply **political, public, and exceptional** as other forms of violence (Phillips, 2008; Pratt, 2005). Insisting that **a suffering body, now, is that which cannot wait**, has the **ethical effect of drawing it into consideration alongside the political, public and exceptional scope of large-scale futures**. It may help us insist on the body, both as a single unit and a plurality, as a legitimate scale of normative priority and social care.¶ In this report, I have explored old and new reflections on the ethical work of urgency and waiting. Geographic research suggests a contemporary popular bias towards the urgency of large-scale futures, institutionalized in ways that further **obscure and discredit the urgencies of the body**. This bias also justifies the production of new **waiting places** in our material landscape, **places like the detention center** and the waiting room. In some cases, waiting is normatively neutral, even providing opportunities for alternative politics. In others, the technologies of waiting serve to manage potentially problematic bodies, leading to suspended suffering and even to extermination (e.g. Wright, 2013). One of my aims has been to suggest that **moral reasoning is important** both because it **exposes normative biases against subjugated people**, and because it potentially **provides routes toward struggle where claims to urgency seem to foreclose** the **possibilities** of alleviation of suffering. **Saving the world still should require a debate about whose world is being saved, when, and at what cost – and this requires a debate about what really cannot wait**. My next report will extend some of these concerns by reviewing how feelings of urgency, as well as hope, fear, and other emotions, have played a role in geography and ethical reasoning.¶ I conclude, however, by pulling together past and present. In 1972, Gilbert White asked why geographers were not engaging ‘the truly urgent questions’ (1972: 101) such as racial repression, decaying cities, economic inequality, and global environmental destruction. His question highlights just how much the discipline has changed, but it is also unnerving in its echoes of our contemporary problems. Since White’s writing, our moral reasoning has been stretched to consider the future body and the more-than-human, alongside the presently urgent body – topics and concerns that I have not taken up in this review but which will provide their own new possibilities for urgent concerns. My own hope presently is drawn from an acknowledgement that the **temporal characteristics of contemporary capitalism** can be interrupted in creative ways (Sharma, 2014), with the possibility of squaring the urgent body with our large-scale future concerns. **Temporal alternatives already exist in ongoing and emerging revolutions** and the disruption of claims of cycles and circular political processes (e.g. Lombard, 2013; Reyes, 2012). Though **calls for urgency will certainly be used to obscure evasion of responsibility** (e.g. Gilmore, 2008: 56, fn 6), they may **also serve as fertile ground for radical critique**, a truly fierce **urgency for now.**

## Case:

### Adv 1 - Debris

#### By definition, mega-constellations make debris cascades inevitable. Turns innovation arguments as we will not be locked off from space

**Siegel 20** [Ethan Siegel, astrophysicist, author, and science communicator, who professes physics and astronomy at various colleges, 2-19-2020, "Flaremageddon: How Satellite Mega-Constellations Could Create A New Natural Disaster," Forbes, [https://www.forbes.com/sites/startswithabang/2020/02/19/flaremageddon-how-satellite-mega-constellations-could-create-a-new-natural-disaster/#51403cf049cf]/Kankee](https://www.forbes.com/sites/startswithabang/2020/02/19/flaremageddon-how-satellite-mega-constellations-could-create-a-new-natural-disaster/#51403cf049cf%5D/Kankee)

Over the next few years, the night sky and the volume of space that surrounds the Earth are both poised to become very different than they've been for all of human history. As of 2019, humanity had launched an estimated total of between 8,000 and 9,000 satellites, with approximately 2,000 of them still active. As SpaceX's Starlink, OneWeb, Amazon's Project Kuiper, Telesat and other companies prepare to provide worldwide 5G coverage from space (more than 300 new satellites have gone up for these purposes [in the last 9 months](https://www.forbes.com/sites/jonathanocallaghan/2020/02/17/spacex-launches-fifth-starlink-mission-and-takes-its-total-number-of-satellites-up-to-300/)), humanity is beginning to enter the era of satellite mega-constellations. While media coverage has largely mentioned only one detrimental effect so far — [the **damage** that these satellites are already causing to astronomy](https://www.forbes.com/sites/startswithabang/2020/01/30/dangers-to-astronomy-intensify-with-spacexs-latest-starlink-launch/) — there's a second consequence that could be even more **disastrous**: **Kessler syndrome**. With tens or even **hundreds of thousands** of satellites in orbit, a **single collision** could trigger a **chain reaction**. With the realities of solar flares and the technological needs of mega-constellations, this new type of natural disaster may be **unavoidable**. The idea of [Kessler syndrome](https://en.wikipedia.org/wiki/Kessler_syndrome) is a simple one: if there are too many satellites around Earth, an unfortunate collision between any two of them could create enough debris that another collision becomes inevitable. Although [there is not widespread agreement](http://physics.ucsc.edu/cosmo/Mountbat.PDF) on when that point will be reached, it's widely recognized that greater numbers of larger satellites greatly increases this risk. With Starlink alone proposing a total of 42,000 satellites in three different orbital shells and many other companies sure to soon follow suit, the **danger** of Kessler syndrome is poised to increase by **orders of magnitude** over the 2020s. In prior years, satellites were launched into orbits that were tracked and knowable, but with occasional collisions occurring due to inactive satellites whose orbits were decaying due to atmospheric drag. With mega-constellations, however, artificial intelligence will be entering the picture, and this poses a tremendous danger. With so many objects in orbit at the same altitude, artificial intelligence will be required in order to constantly leverage the on-board thrusters to accomplish three main goals: to ensure the correct, continuous spacing of the satellites to provide the necessary internet coverage, to compensate for the drag of Earth's atmosphere, and to perform any necessary boosts or orbital alterations to avoid collisions with other satellites. This last point is absolutely critical. Any two orbits at the same altitude always have two points where they will cross, and satellite drift would make a collision inevitable. Only by having the satellites correct their own courses in real-time can they ensure a collision-free scenario. But this plan comes along with a catastrophic scenario: what if the satellites are rendered **non-responsive** by some event? If constant orbital corrections are needed in order to avoid collisions with other satellites, the worst thing that could happen would be a scenario that ~~paralyzed~~ [stopped] the satellites and made them unable to respond to not only the artificial intelligence, but to a manual command. This is not some science-fiction horror scenario, but something as inevitable as the Sun itself: space weather. Events like solar flares, coronal mass ejections, and even the plain old solar wind all send charged particles away from the Sun. When they happen to get sent on their way towards planet Earth, our surface is protected by our world's magnetic field and our atmosphere. The danger to humans or any biological organism is essentially zero, with the largest effect that commonly occurs being a spectacular looking auroral display. But in space, even in low-Earth orbit, the atmosphere offers no protection, and the magnetic field offers no guarantee of redirecting these particles away from satellites. [According to NOAA](https://www.swpc.noaa.gov/impacts): Solar Energetic Particles (energetic protons) can penetrate satellite electronics and cause electrical failure. These energetic particles also block radio communications at high latitudes in during Solar Radiation Storms. Right now, the Sun is in the quietest part of its periodic solar cycle. On timescales of 11 years, the number of sunspots — which correlates directly with the odds of flaring activity and coronal mass ejections — goes from essentially zero (a quiet Sun) to solar maximum and back to zero again. Right now, in 2020, we're just leaving the last solar minimum, with the next maximum anticipated to occur in 2024 or 2025 and every 11 years after that. There's a tremendous danger to satellites whenever this type of space weather impacts them. If these energetic protons cause any type of electrical failure in these satellites, they will be unable to adjust their course via artificial intelligence or any other means. If they cannot adjust their course, the question of any two of these satellites colliding becomes a game of **Russian roulette**, where there are likely to be a series of near-misses before the inevitable — an in-space collision between two of them — occurs. The worst-case scenario, and this scenario gets worse with every new large satellite that goes up (and every communications satellite is "large" by this metric), is that each collision increases both the likelihood and frequency of in-orbit collisions. In short order, potentially just weeks or months, the region around Earth will become a debris field, with a significant percent of existing satellites destroyed. At present, every space disaster, [including collisions](https://en.wikipedia.org/wiki/2009_satellite_collision) and failed missions that have exploded or malfunctioned in various ways, means that there are perhaps a few hundred thousand pieces of space debris the size of your fingernail or larger. These are already hazardous to our existing satellites, with one of them colliding with the International Space Station just a few years ago, cracking a window. But with hundreds of thousands of large satellites, a single collision could set off a **catastrophic chain reaction** like we've never seen. In short order, the number of pieces of space debris could rise into the **tens of millions**, impacting satellites in both low-Earth orbit and medium-Earth orbit. The first company whose satellites cause such a **disaster** would likely impact every other one, to say nothing of **military** and **scientific** satellites presently in orbit. Not only will satellite technology become an impossibility for decades or even many **generations**, but routine space launches will become an **enormous gamble**. The greatest danger that the Sun poses to Earth today is a large-scale coronal mass ejection, which — if it heads right for us with the wrong magnetic field orientation — could lead to a wide-scale electrical catastrophe that could knock out power grids all over the Earth, starting fires and causing trillions of dollar in damage to our infrastructure.

#### **Kessler syndrome causes massive impacts to climate and weather prediction with the poor and rural communities hit harder**

**Undseth et al 21** [Marit Undseth, OECD Space Forum, Claire Jolly, OECD Space Forum, Mattia Olivari, OECD Space Forum, “The Economics of Space Debris in Perspective,” 8th European Conference on Space Debris,<https://conference.sdo.esoc.esa.int/proceedings/sdc8/paper/12/SDC8-paper12.pdf>] /Triumph Debate

**The current costs of space debris are nothing compared with future prospects**. In a worst-case scenario, **certain orbits may become unusable, due to continued, self-reinforcing space debris generation** (Kessler Syndrome). **This would have significant negative impacts on the provision of several important government services** and would most probably also slow down economic growth in the space sector. **The social costs would be unequally distributed, with lower-income and rural regions more hardly hit**, in view of their growing dependence on satellite communications, in particular. These costs are listed in Tab. 2 and are further elaborated in the following paragraphs.

Loss of unique applications and functionalities: The orbits most likely to be disrupted by the Kessler Syndrome are found at 650-1000 km and towards 1400 km altitude in the low-earth orbit, where the thickest belts of debris are located. For instance, the 2009 collision between Iridium-33 and Kosmos-2251 satellites took place at 776 km altitude. In some cases, **the disruption or loss of certain low-earth orbits would have severe impacts on terrestrial applications, for which space observations** (from these orbits) **are either the best or the only source of data and signals**. (Tab. 3). **This applies in particular to polar-orbiting weather** and earth observation **satellites, which make unique contributions to weather forecasting and climate change observations and research**. Polar-orbiting weather satellites provide essential inputs to numerical weather prediction models, reducing errors and improving forecast accuracy [23]. The European Centre for Medium-Range Weather Forecasts has found that **a simultaneous loss of both European and US polar-orbiting satellites would cause a 15-20% reduction in accuracy** [24]. For instance, estimated benefits from satellite-based meteorological observations to the UK economy amount to between GBP 670-1000 million annually [25]. The loss of polar-orbiting weather satellite observations would also heavily affect the Southern hemisphere, where there are fewer terrestrial observations. Lives lost: The International Space Station is located at about 400 km altitude. The planned Chinese Space Station will have a similar location. Although debris at that altitude decays naturally, it still poses a real collision threat. The International Space Station has seen a significant increase in debris avoidance manoeuvres, with seventeen manoeuvres taking place between 2009 and 2017, compared to eight manoeuvres in the 1999- 2008 timeframe [26], [27]. Interrupted time series for earth science and climate research: **Uninterrupted time series are crucial for the accuracy and reliability of weather prediction and climate models**. Several **weather and earth observation satellites in affected orbits make unique measurements for climate observations**. The Jason-2 and Jason-3 satellites, located at 1336 km altitude, measure variations in sea surface height, which provide information about global sea levels, the speed and direction of ocean currents, and heat stored in the ocean. Curbed economic growth in the space sector: Current commercial operators (mostly earth observation and telecom) are mainly located at 400-700 km altitudes [28]. Although the current value of commercial operations in the low-earth orbit is significantly lower than that of telecommunications activities in the geostationary orbit, satellite broadband is widely considered a key driver of space activities and revenues in the coming decades, despite uncertainty concerning business models and viability. Many LEO communication services would be affected by space debris, on orbit and/or during orbitraising, as several of the planned constellations are located near or above the thickest LEO debris belts. This could have knock-on effects on other industry segments, such as manufacturing and launch. Reduced access to finance for space ventures: While the current financial climate is favourable for space sector investments, it is important to acknowledge that many space applications face growing competition from terrestrial applications (e.g. communications, earth observation). It is reasonable to expect that a growing space debris problem may deter investments into the sector, with investors preferring more affordable and less risky terrestrial alternatives. Negative distributional effects: **The loss or perturbation of certain low-earth orbits would affect some groups and geographic regions more heavily than others**, depending on the coverage and quality of existing terrestrial infrastructure. **In some low-income countries, satellite systems may provide more reliable and accurate data and signals than terrestrial alternatives. One of the big selling points for space broadband is its ability to connect hard-to-reach places**, including rural regions in both developed and developing countries.

### 2 – Corporate Colonialism:

#### Private space colonization amounts to unchecked exploitation and authoritarian corporate control of future settlements, propagating SV.

**Spencer ‘17**

Spencer, Keith A. [senior editor at Salon] “Keep the Red Planet Red.” Jacobin, 2 May 2017, [https://www.jacobinmag.com/2017/02/mars-elon-musk-space-exploration-nasa-colonization. //](https://www.jacobinmag.com/2017/02/mars-elon-musk-space-exploration-nasa-colonization.%20%20//) Accesserd 12/15/2021 // marlborough JH

As the Western liberal order continues to unravel, can you really blame anyone who wants to get off this planet? Since space travel became technologically feasible in the twentieth century, many thinkers — from Arthur C. Clarke to Buckminster Fuller — envisioned the human colonization of other planets as all but inevitable. “Man will not always stay on Earth,” wrote Soviet rocket scientist Konstantin Tsiolkovsky, “the pursuit of light and space will lead him to penetrate the bounds of the atmosphere, timidly at first, but in the end to conquer the whole of solar space.” In their heydays, both the American and Soviet space programs funded [research](http://www.astronautix.com/m/mpk.html) into Mars colonization, viewing it as the next logical step for humanity. In the past two decades however, people have started to pin their hopes for intergalactic travel on private groups instead of public agencies. While President Obama was [privatizing](http://www.businessinsider.com/startups-in-space-2009-8) much of the American space program, a flurry of ventures released competing proposals to visit and/or colonize the red planet. These schemes’ feasibility and harebrained-ness vary: the Mars Foundation, run by multimillionaire former investor Dennis Tito, is soliciting private donations to send a couple on a [flyby](http://www.space.com/19981-private-mars-mission-married-2018.html) of the red planet. Mars One, a Dutch nonprofit, wants to [fund](http://www.mars-one.com/faq/finance-and-feasibility/what-is-mars-ones-funding-model) a permanent human colony through “merchandise sales, ads on video content, brand partnerships, speaking engagements, [b]roadcasting rights, intellectual property rights, games & apps, and events.” The most famous — and perhaps most likely to succeed — comes from entrepreneur and engineer Elon Musk, the multibillionaire CEO of SpaceX and Tesla Motors. Musk’s articulation of his Mars mission reveals not only what’s wrong with how we think about extraterrestrial colonies and resources, but also how little faith most people have in democracy here on Earth. Interplanetary Technocracy Given his reputation as an engineering genius, Musk’s vision for colonization seems the most plausible of the private missions to Mars. After all, SpaceX, which he admitted to founding [specifically](https://www.bloomberg.com/news/articles/2016-09-27/elon-musk-s-vision-for-mars-travel-focuses-on-reusable-rockets) to colonize the solar system, became the first private company to successfully launch a rocket into orbit in 2008. In September 2016, at the International Astronautical Congress in Guadalajara, Musk laid out a detailed [vision](https://www.wired.com/2016/09/elon-musk-colonize-mars/) for his colonization project, including financial estimates, engineering specs for the reusable “Interplanetary Transit System,” and the price of a passenger ticket — around $200,000. Musk’s presentation even included a snazzy computer-animated [video](https://www.nytimes.com/2016/09/28/science/elon-musk-spacex-mars-exploration.html?_r=0) of the transit system in action and [details](http://www.slate.com/blogs/future_tense/2016/09/27/elon_musk_details_his_crazy_very_real_plan_to_colonize_mars.html) about the long trip there, which would offer colonists games, restaurants, and entertainment. “It’ll be, like, really fun to go . . . You’re gonna have a great time,” Musk said. His approach to colonizing Mars comes straight out of Silicon Valley’s playbook: Musk has taken a “problem” — how to colonize Mars — and hacked a feasible “solution” that is one part engineering, one part moxie. Just add investors and we’ll be building cities on the red planet in no time. Though vague, Musk reiterated that his vision would need funding. His talk of “tickets” implies that colonists will likely pay for much of the mission. Unlike a space agency’s astronaut selection process, then, his Mars mission will be limited to those who can afford it. In that sense, Musk’s colonization plan looks a lot like joining a country club or gated community — or any other model of private access to space for those who can afford it. Musk’s proposal — heavy on the engineering and business details, light on the philosophical or political implications of colonization — epitomizes technocracy. He doesn’t seem interested in thinking through Mars’s policy or governance, the labor necessitated by building a civilization from scratch, or the problems that will arise from sending rich tourists to self-manage in a place with scant resources demanding communal organization and thinking. The True Value of Mars For some, sending a few rich folks off to Mars seems like a great idea. After all, it’s hardly an Eden waiting to be destroyed. Unlike previous colonial projects, there are no natives to exploit; no wildlife to hunt to extinction; no ecosystem to radically alter; no fossil fuels to extract; and no climate in danger of destruction from carbon emission. Mars’s atmosphere is already 96 percent carbon dioxide! Why not let Musk and his millionaire buddies take off for a few rounds of golf on the [frosted dunes](https://www.nasa.gov/image-feature/frosted-dunes-on-mars)? If they get stuck there, all the better. From a humanistic perspective, however, even a lifeless world like Mars holds incredible scientific, educational, and environmental value. To let private interests colonize, terraform, or populate it without considering this collective value would be short-sighted. Indeed, when it comes to colonization, we should hope humanity has learned from its past mistakes and is ready to set upon a more democratic process. Perhaps Earth can agree to hold a public discussion before we set about strip-mining Mars’s glorious dunes, vistas, and mountains, lest [the tallest mountain](https://mars.jpl.nasa.gov/gallery/atlas/olympus-mons.html) in the solar system become a [trash heap](https://www.washingtonpost.com/news/morning-mix/wp/2015/03/03/decades-of-human-waste-have-made-mount-everest-a-fecal-time-bomb/) like Everest. Government space agencies have gone to great lengths to keep the scientific and social benefits of publicly funded exploration intact. This is why NASA makes all its mission data [public](https://www.nasa.gov/open/data.html), and also why it insists on sterilizing space probes to avoid contaminating other worlds with cellular life from Earth — one stray terrestrial extremophile could confuse the search for microbial life off-planet. The agency, recognizing its work’s educational value, has sent elementary school children’s [experiments](https://www.nasa.gov/feature/first-cubesat-built-by-an-elementary-school-deployed-into-space) into space and hosted [public naming competitions](https://www.nasa.gov/press/2015/april/nasa-extends-campaign-for-public-to-name-features-on-pluto) for geographic features. Likewise, NASA thinks beyond the engineering challenges: they also consider space travel’s psychological and biological effects, surely an important field of study in anticipation of the long space flights required for interplanetary travel. Private industry will be unlikely to follow these collective practices, as its desire for profit or for exclusive property rights — physical and intellectual — will outweigh any public benefit. I Want to Believe The public and media reaction to Musk’s presentation — more than the presentation itself —reflects the current state of our politics. “The mood at the conference was almost as giddy as a rock concert or the launch of a new Apple product, with people lining up for Mr. Musk’s presentation a couple of hours in advance,” wrote Kenneth Chang in the [New York Times](https://www.nytimes.com/2016/09/28/science/elon-musk-spacex-mars-exploration.html?_r=1), who devoted 1,200 words to it. “Elon Musk finally told the world his vision for colonizing Mars, and it turned out to be one hell of a show,” exclaimed Loren Grush in a [video article](https://www.theverge.com/2016/9/30/13114704/spacex-elon-musk-vs-mars-one-nasa-mission-timeline) for the Verge. Grush noted that Musk drew an “insane crowd,” describing how “people actually stampeded into the hall where his lecture was in order to get a good seat.” He began in lofty tones: “I want to . . . make Mars seem possible. Make it seem as though it is something we can do in our lifetimes.” This statement implied that we needed some great technological leap forward before embarking on this adventure, but, in fact, travel to Mars has been possible for well over half a century. Given the political will, we can go right now. The subtext of Musk’s message, then, was that our democratic governments will never execute big science and engineering projects. People should trust in the private vision for colonization and space travel instead. In Earth politics, this lack of faith in democratic institutions is nothing new. This idea’s policy implications — that collectively we can’t have big public projects or any sort of real democratic decision-making, and must cede our whims to privately funded foundations and technocratic “experts” — have already taken hold of most countries. As far as I could find, none of the magazines that covered Musk’s announcement mentioned this metatheme, namely, that a public and democratically organized colonization of Mars will never happen. No one questioned the premise that we must let billionaires decide how and when to go to Mars — or that it is the only possible way to get there. Musk’s tech-industry social circle benefits from branding technology as synonymous with progress. As a result, many tech employees work long hours to achieve this invisible notion of progress, but their work just fattens their employer’s profit margins. One can imagine the grueling labor required to make an inhospitable planet habitable. On Mars, employees would exhaust themselves for a corporation under the guise of “survival.” After all, regardless of whether a foundation or a corporation spearheads the colonization effort, they will be incentivized, even forty million miles away, to squeeze [as much labor out of their workers](https://www.dailykos.com/story/2015/5/5/1372730/-Skylab-and-the-Sit-Down-Strike-in-Space) at the lowest cost. Further, the question of who is allowed to go to Mars will become as important as the question of who isn’t. If, as Musk proposes, the trip requires a “ticket” — which, as he claims, will eventually drop to only $100,000 — it seems probable that those who can afford to go will mostly resemble, ethnically and politically, Earth’s ruling class. Imagine: the red planet turned racist country club. These questions matter more than how to engineer a rocket or how to build greenhouses or how to harvest water. In fact, state-funded research has already largely solved these technical problems — or, at the least, led to numerous [creative ideas](https://www.newscientist.com/article/mg21628855.100-build-a-mars-base-with-a-box-of-engineered-bugs.html) about making a Mars colony self-sufficient. The Martian Commons Any colonization effort on Mars — even if only a small number of humans go — will present huge political challenges in terms of the labor and personal rights of its citizens. To wit: what kinds of reproductive restrictions will exist on a planet of scarce resources? How will colonists ration food and activity? What about personal privacy? If Martian citizens are working in a life-or-death situation, can the workers strike? At least in its early years, Mars would have a scarcity economy — in other words, resources would likely have to be rationed in order for the collective to survive. A private colony would be unlikely to make any kind of egalitarian guarantee — after all, if there’s a ticket price, there will certainly be a Martian service economy pampering the space tourists. Inequalities will emerge in terms of labor, housing, food, and access to other resources. In fact, we already know what a privatized Mars might resemble: Mount Everest. At higher elevations, it becomes a barren, lifeless, cold world, where climbers require oxygen tanks to survive. The cost of ascending is as steep as the mountain: [between $30,000 to $100,000](https://www.outsideonline.com/1929131/how-much-does-it-cost-climb-everest). Climbers’ journeys are only made possible by their Sherpas’ exploited labor, many of whom die in accidents and are paid [as little as](https://kristof.blogs.nytimes.com/2016/03/28/sherpa-they-die-we-go-home/) $5,000 a year by Western companies. Now imagine this situation replicated forty million miles off, on a lifeless planet, where two-way Earth communication takes almost an hour, and you can envision how dire things could get. A New Hope Musk spent nearly an hour of his speech detailing the technological aspects of Mars travel: the landers, the rockets, the fuel costs, and so on. Musk takes a technology-first approach and rarely mentions the numerous social aspects. His speech and its collective reactions attest to a naïve, John Galt fantasy about how policy and engineering come to pass: through the mind of the lone genius, who alone holds the key to humanity’s future. We saw the same fantasy at work last week when, in the wake of President Trump’s executive order banning emigration from seven majority-Muslim countries, Starbucks CEO Howard Schultz [announced](http://www.businessinsider.com/starbucks-boycott-after-ceos-refugee-support-2017-1) his plan to hire ten thousand refugees and was immediately hailed as a [liberal hero](http://www.huffingtonpost.com/entry/boycott-starbucks-backfires_us_58903e39e4b0c90efeffd8af). The message was clear: we can’t hope to help refugees ourselves, or on a democratic basis — we must rely on the whims of the rich to push forward progressive causes. Alas, the reaction to Musk’s speech also demonstrates how public sentiment has changed: collectively, we no longer believe in public space exploration. Even if we know state agencies can launch a Mars mission, few think it will happen. This doesn’t bode well for how we think of the commons. Are rich people and their foundations the [only ones who can save us](https://www.jacobinmag.com/2016/11/david-brock-clinton-sanders-donald-trump/)? The plethora of private Mars proposals reflects a [lack of faith in democracy on Earth](https://www.jacobinmag.com/2016/07/populism-democracy-technocrats-brexit-trump-sanders-voting-referendum/), in particular in our democratic influence over the directions science and engineering research take. And while faith in public institutions sits at an all-time low, we seem more than happy to hear what the rich can make possible and to believe their promises. Musk is just one of many technocrats who think of a Mars voyage as a technological problem. Not only is it not a technological problem, it’s not even a problem. Colonization of Mars should be seen as a complex social and political policy, with so much potential to create inequality and oppression that it cannot rationally be undertaken without political consensus and a stratagem for maintaining democracy and egalitarianism. We are ready to colonize Mars, and have been for half a century. Doing so without a democratic plan will present unimaginable dangers for the planet and colonists alike. As socialists, our rallying cry should be this: [Keep the red planet red](https://www.jacobinmag.com/2015/04/aliens-extraterrestrials-active-seti/)!

#### Tech-billionaires advance private space colonization as a source of infinite resources. This replicates the logic of imperialism.

**Mccormick 21** [Ted McCormick writes about the history of science, empire, and economic thought. He has a Ph.D. in history from Columbia University and teaches at Concordia University in Montreal. “The billionaire space race reflects a colonial mindset that fails to imagine a different world”. 8-15-2021. The Conversation. https://theconversation.com/the-billionaire-space-race-reflects-a-colonial-mindset-that-fails-to-imagine-a-different-world-165235. Accessed 12-15-2021; //marlborough JH]

It was a time of political uncertainty, cultural conflict and social change. Private ventures exploited technological advances and natural resources, generating unprecedented fortunes while wreaking havoc on local communities and environments. The working poor crowded cities, spurring property-holders to develop increased surveillance and incarceration regimes. Rural areas lay desolate, buildings vacant, churches empty — the stuff of moralistic elegies. ¶Epidemics raged, forcing quarantines in the ports and lockdowns in the streets. [Mortality data](https://wellcomecollection.org/works?query=%22bills+of+mortality%22&production.dates.from=1600&production.dates.to=1699&sortOrder=asc&sort=production.dates) was the stuff of weekly news and [commentary](https://doi.org/10.7227/TSC.27.3.2). ¶Depending on the perspective, mobility — chosen or compelled — was either the cause or the consequence of general disorder. Uncontrolled mobility was associated with political instability, moral degeneracy and social breakdown. However, one form of planned mobility promised to solve these problems: colonization. ¶Europe and its former empires have changed a lot since the 17th century. But the persistence of colonialism as a supposed panacea suggests we are not as far from the early modern period as we think. ¶Colonial promise of limitless growth ¶Seventeenth-century colonial schemes involved plantations around the Atlantic, and motivations that now sound archaic. Advocates of expansion such as the English writer Richard Hakluyt, whose [Discourse of Western Planting (1584)](http://nationalhumanitiescenter.org/pds/amerbegin/exploration/text5/hakluyt.pdf) outlined the benefits of empire for Queen Elizabeth: the colonization of the New World would prevent Spanish Catholic hegemony and provide a chance to claim Indigenous souls for Protestantism. ¶But a key promise was the economic and social renewal of the mother country through new commodities, trades and territory. Above all, planned mobility would cure the ills of apparent overpopulation. Sending the poor overseas to cut timber, mine gold or farm cane would, [according to Hakluyt](https://www.digitalhistory.uh.edu/disp_textbook.cfm?smtID=3&psid=70), turn the “multitudes of loiterers and idle vagabonds” that “swarm(ed)” England’s streets and “pestered and stuffed” its prisons into industrious workers, providing raw materials and a reason to multiply. Colonization would fuel limitless growth. ¶As English plantations took shape in Ulster, Virginia, New England and the Caribbean, “[projectors](https://doi.org/10.1163/15733823-00215p01)” — individuals (nearly always men) who promised to use new kinds of knowledge to radically and profitably transform society — tied mobility to new sciences and technologies. They were inspired as much by English philosopher Francis Bacon’s vision of a tech-centred state in [The New Atlantis](https://www.gutenberg.org/files/2434/2434-h/2434-h.htm) as by his advocacy of observation and experiment. ¶Discovery and invention ¶The English agriculturalist Gabriel Plattes cautioned in 1639 that “[the finding of new worlds is not like to be a perpetual trade](https://quod.lib.umich.edu/cgi/t/text/pageviewer-idx?cc=eebo2;c=eebo2;idno=a68588.0001.001;node=A68588.0001.001:5;seq=29;vid=15242;page=root;view=text).” But many more saw a supposedly vacant America as an invitation to transplant people, plants and machinery. ¶The inventor Cressy Dymock (from Lincolnshire, where fen-drainage schemes were turning wetlands dry) sought support for a “[perpetual motion engine](https://www.dhi.ac.uk/hartlib/view?docset=main&docname=62A_08)” that would plough fields in England, clear forest in Virginia and drive sugar mills in Barbados. Dymock identified private profit and the public good by speeding plantation and replacing costly draught animals with cheaper enslaved labour. Projects across the empire would employ the idle, create “elbow-room,” heal “unnatural divisions” and make England “[the garden of the world](https://www.dhi.ac.uk/hartlib/view?docset=main&docname=64_18).” ¶Extraterrestrial exploration ¶Today, the moon and Mars are in projectors’ sights. And the promises billionaires Elon Musk and Jeff Bezos make for colonization are similar in ambition to those of four centuries ago. ¶As Bezos told an audience at the [International Space Development Conference](https://www.geekwire.com/2018/jeff-bezos-isdc-space-vision/) in 2018: “We will have to leave this planet, and we’re going to leave it, and it’s going to make this planet better.” Bezos traces his thinking to Princeton physicist Gerald O’Neill, whose 1974 article “[The Colonization of Space](https://space.nss.org/the-colonization-of-space-gerard-k-o-neill-physics-today-1974/)” (and 1977 book, The High Frontier) presented orbiting settlements as solutions to nearly every major problem facing the Earth. Bezos echoes O’Neill’s proposal to move heavy industry — and industrial labour — off the planet, rezoning Earth as a mostly residential, green space. A garden, as it were. ¶Musk’s plans for Mars are at once more cynical and more grandiose, in timeline and technical requirements if not in ultimate extent. They center on the dubious possibility of “[terraforming](https://www.businessinsider.com/nasa-just-quashed-elon-musks-plans-to-make-mars-habitable-for-humans-2018-7)” Mars using resources and technologies that don’t yet exist. ¶Musk planned to [send the first humans to Mars in 2024](https://www.businessinsider.com/elon-musk-spacex-mars-plan-timeline-2018-10), and by 2030, he envisioned breaking ground on a city, [launching as many as 100,000 voyages from Earth to Mars](https://www.businessinsider.com/elon-musk-says-we-could-put-a-million-people-on-mars-within-a-century-2015-6) within a century. ¶As of 2020, the timeline had been pushed back slightly, in part because terraforming may require bombarding Mars with 10,000 nuclear missiles to start. But the vision – a Mars of thriving crops, pizza joints and “entrepreneurial opportunities,” preserving life and paying dividends while Earth becomes increasingly uninhabitable — remains. Like the colonial [company-states](https://doi.org/10.1177/1354066120928127) of the 17th and 18th centuries, [Musk’s SpaceX leans heavily on government backing but will make its own laws on its newly settled planet](http://bostonreview.net/science-nature/alina-utrata-lost-space). ¶A failure of the imagination ¶The techno-utopian visions of Musk and Bezos betray some of the same assumptions as their early modern forebears. They offer colonialism as a panacea for complex social, political and economic ills, rather than attempting to work towards a better world within the constraints of our environment. ¶And rather than facing the palpably devastating consequences of an ideology of limitless growth on our planet, they seek to export it, unaltered, into space. They imagine themselves capable of creating liveable environments where none exist. ¶But for all their futuristic imagery, they have failed to imagine a different world. And they have ignored the history of colonialism on this one. Empire never recreated Eden, but it did fuel centuries of growth based on expropriation, enslavement and environmental transformation in defiance of all limits. We are struggling with these consequences today.

#### Impact: Neoliberalism destroys ethics, locks in poverty and exploitation, decimates the environment, and causes war.

**Werlhof 15** – Claudia, Professor of Political Science/Women's Studies, University Innsbruck (Austria), 2015 (“Neoliberal Globalization: Is There an Alternative to Plundering the Earth?” Global Research, May 25th, Available Online at http://www.globalresearch.ca/neoliberal-globalization-is-there-an-alternative-to-plundering-the-earth/24403)

. Small and medium private businesses – which, until recently, employed eighty percent of the workforce and provided normal working conditions – are affected by these developments as well. The alleged correlation between economic growth and secure employment is false. When economic growth is accompanied by the mergers of businesses, jobs are lost.[13] If there are any new jobs, most are precarious, meaning that they are only available temporarily and badly paid. One job is usually not enough to make a living.[14] This means that the working conditions in the North become akin to those in the South, and the working conditions of men akin to those of women – a trend diametrically opposed to what we have always been told. Corporations now leave for the South (or East) to use cheap – and particularly female – labor without union affiliation. This has already been happening since the 1970s in the “Export Processing Zones” (EPZs, “world market factories” or “maquiladoras”), where most of the world’s computer chips, sneakers, clothes and electronic goods are produced.[15] The EPZs lie in areas where century-old colonial-capitalist and authoritarian-patriarchal conditions guarantee the availability of cheap labor.[16] The recent shift of business opportunities from consumer goods to armaments is a particularly troubling development.[17] It is not only commodity production that is “outsourced” and located in the EPZs, but service industries as well. This is a result of the so-called Third Industrial Revolution, meaning the development of new information and communication technologies. Many jobs have disappeared entirely due to computerization, also in administrative fields.[18] The combination of the principles of “high tech” and “low wage”/”no wage” (always denied by “progress” enthusiasts) guarantees a “comparative cost advantage” in foreign trade. This will eventually lead to “Chinese wages” in the West. A potential loss of Western consumers is not seen as a threat. A corporate economy does not care whether consumers are European, Chinese or Indian. The means of production become concentrated in fewer and fewer hands, especially since finance capital – rendered precarious itself – controls asset values ever more aggressively. New forms of private property are created, not least through the “clearance” of public property and the transformation of formerly public and small-scale private services and industries to a corporate business sector. This concerns primarily fields that have long been (at least partly) excluded from the logic of profit – e.g. education, health, energy or water supply/disposal. New forms of so-called enclosures emerge from today’s **total commercialization of** formerly small-scale private or public industries and services, of the “commons”, and of natural resources like oceans, rain forests, regions of genetic diversity or geopolitical interest (e.g. potential pipeline routes), etc.[19] As far as the new virtual spaces and communication networks go, we are witnessing frantic efforts to bring these under private control as well.[20] All these new forms of private property are essentially created by (more or less) predatory forms of appropriation. In this sense, they are a continuation of the history of so-called original accumulation which has expanded globally, in accordance with to the motto: “Growth through expropriation!”[21] Most people have less and less access to the means of production, and so the dependence on scarce and underpaid work increases. The destruction of the welfare state also destroys the notion that individuals can rely on the community to provide for them in times of need. Our existence relies exclusively on private, i.e. expensive, services that are often of much worse quality and much less reliable than public services. (It is a myth that the private always outdoes the public.) What we are experiencing is undersupply formerly only known by the colonial South. The old claim that the South will eventually develop into the North is proven wrong. It is the North that increasingly develops into the South. We are witnessing the latest form of “development”, namely, a world system of underdevelopment.[22] Development and underdevelopment go hand in hand.[23] This might even dawn on “development aid” workers soon. It is usually women who are called upon to counterbalance underdevelopment through increased work (“service provisions”) in the household. As a result, the workload and underpay of women takes on horrendous dimensions: they do unpaid work inside their homes and poorly paid “housewifized” work outside.[24] Yet, commercialization does not stop in front of the home’s doors either. Even housework becomes commercially co-opted (“new maid question”), with hardly any financial benefits for the women who do the work.[25] Not least because of this, women are increasingly coerced into prostitution, one of today’s biggest global industries.[26] This illustrates two things: a) how little the “emancipation” of women actually leads to “equal terms” with men; and b) that “capitalist development” does not imply increased “freedom” in wage labor relations, as the Left has claimed for a long time.[27] If the latter were the case, then neoliberalism would mean the voluntary end of capitalism once it reaches its furthest extension. This, however, does not appear likely. Today, hundreds of millions of quasi-slaves, more than ever before, exist in the “world system.”[28] The authoritarian model of the “Export Processing Zones” is conquering the East and threatening the North. The redistribution of wealth runs ever more – and with ever accelerated speed – from the bottom to the top. The gap between the rich and the poor has never been wider. The middle classes disappear. This is the situation we are facing. It becomes obvious that neoliberalism marks not the end of colonialism but, to the contrary, the colonization of the North. This new “colonization of the world”[29] points back to the beginnings of the “modern world system” in the “long 16th century”, when the conquering of the Americas, their exploitation and colonial transformation allowed for the rise and “development” of Europe.[30] The so-called “children’s diseases” of modernity keep on haunting it, even in old age. They are, in fact, the main feature of modernity’s latest stage. They are expanding instead of disappearing. Where there is no South, there is no North; where there is no periphery, there is no center; where there is no colony, there is no – in any case no “Western” – civilization.[31] Austria is part of the world system too. It is increasingly becoming a corporate colony (particularly of German corporations). This, however, does not keep it from being an active colonizer itself, especially in the East.[32] Social, cultural, traditional and ecological considerations are abandoned and give way to a mentality of plundering. All global resources that we still have – natural resources, forests, water, genetic pools – have turned into objects of utilization. Rapid ecological destruction through depletion is the consequence. If one makes more profit by cutting down trees than by planting them, then there is no reason not to cut them.[33] Neither the public nor the state interferes, despite global warming and the obvious fact that the clearing of the few remaining rain forests will irreversibly destroy the earth’s climate – not to mention the many other negative effects of such actions.[34] Climate, animal, plants, human and general ecological rights are worth nothing compared to the interests of the corporations – no matter that the rain forest is not a renewable resource and that the entire earth’s ecosystem depends on it. If greed, and the rationalism with which it is economically enforced, really was an inherent anthropological trait, we would have never even reached this day. The commander of the Space Shuttle that circled the earth in 2005 remarked that “the center of Africa was burning”. She meant the Congo, in which the last great rain forest of the continent is located. Without it there will be no more rain clouds above the sources of the Nile. However, it needs to disappear in order for corporations to gain free access to the Congo’s natural resources that are the reason for the wars that plague the region today. After all, one needs diamonds and coltan for mobile phones. Today, everything on earth **is turned** into commodities, i.e. everything becomes an object of “trade” and commercialization (which truly means liquidation, the transformation of all into liquid money). In its neoliberal stage it is not enough for capitalism to globally pursue less cost-intensive and preferably “wageless” commodity production. The objective is to transform everyone and everything into commodities, including life itself.[35] We are racing blindly towards the violent and absolute conclusion of this “mode of production”, namely total capitalization/liquidation by “monetarization”.[36] We are not only witnessing perpetual praise of the market – we are witnessing what can be described as “market fundamentalism”. People believe in the market as if it was a god. There seems to be a sense that nothing could ever happen without it. Total global maximized accumulation of money/capital as abstract wealth becomes the sole purpose of economic activity. A “free” world market for everything has to be established – a world market that functions according to the interests of the corporations and capitalist money. The installment of such a market proceeds with dazzling speed. It creates new profit possibilities where they have not existed before, e.g. in Iraq, Eastern Europe or China. One thing remains generally overlooked: the abstract wealth created for accumulation implies the destruction of nature as concrete wealth. The result is a “hole in the ground” and next to it a garbage dump with used commodities, outdated machinery and money without value.[37] However, once all concrete wealth (which today consists mainly of the last natural resources) will be gone, abstract wealth will disappear as well. It will, in Marx’s words, “evaporate”. The fact that abstract wealth is not real wealth will become obvious, and so will the answer to the question of which wealth modern economic activity has really created. In the end it is nothing but monetary wealth (and even this mainly exists virtually or on accounts) that constitutes a monoculture controlled by a tiny minority. Diversity is suffocated and millions of people are left wondering how to survive. And really: how do you survive with neither resources nor means of production nor money? The nihilism of our economic system is evident. The whole world will be transformed into money – and then it will disappear. After all, money cannot be eaten. What no one seems to consider is the fact that it is impossible to re-transform commodities, money, capital and machinery into nature or concrete wealth. It seems that underlying all “economic development” is the assumption that “resources”, the “sources of wealth”,[38] are renewable and everlasting – just like the “growth” they create.[39] The notion that capitalism and democracy are one is proven a myth by neoliberalism and its “monetary totalitarianism”.[40] The primacy of politics over economy has been lost. Politicians of all parties have abandoned it. It is the corporations that dictate politics. Where corporate interests are concerned, there is no place for democratic convention or community control. Public space disappears. The res publica turns into a res privata, or – as we could say today – a res privata transnationale (in its original Latin meaning, privare means “to deprive”). Only those in power still have rights. They give themselves the licenses they need, from the “license to plunder” to the “license to kill”.[41] Those who get in their way or challenge their “rights” are vilified, criminalized and to an increasing degree defined as “terrorists” or, in the case of defiant governments, as “rogue states” – a label that usually implies threatened or actual military attack, as we can see in the cases of Yugoslavia, Afghanistan and Iraq, and maybe Syria and Iran in the near future. U.S. President Bush had even spoken of the possibility of “preemptive” nuclear strikes should the U.S. feel endangered by weapons of mass destruction.[42] The European Union did not object.[43] Neoliberalism and war are two sides of the same coin.[44] Free trade, piracy and war are still “an inseparable three” – today maybe more so than ever. War is not only “good for the economy” but is indeed its driving force and can be understood as the “continuation of economy with other means”.[45] War and economy have become almost indistinguishable.[46] Wars about resources – especially oil and water – have already begun.[47] The Gulf Wars are the most obvious examples. Militarism once again appears as the “executor of capital accumulation” – potentially everywhere and enduringly.[48] Human rights and rights of sovereignty have been transferred from people, communities and governments to corporations.[49] The notion of the people as a sovereign body has practically been abolished. We have witnessed a coup of sorts. The political systems of the West and the nation state as guarantees for and expression of the international division of labor in the modern world system are increasingly dissolving.[50] Nation states are developing into “periphery states” according to the inferior role they play in the proto-despotic “New World Order”.[51] Democracy appears outdated. After all, it “hinders business”.[52] The “New World Order” implies a new division of labor that does no longer distinguish between North and South, East and West – today, everywhere is South. An according International Law is established which effectively functions from top to bottom (“top-down”) and eliminates all local and regional communal rights. And not only that: many such rights are rendered invalid both retroactively and for the future.[53] The logic of neoliberalism as a sort of totalitarian neo-mercantilism is that all resources, all markets, all money, all profits, all means of production, all “investment opportunities”, all rights and all power belong to the corporations only. To paraphrase Richard Sennett: “Everything to the Corporations!”[54] One might add: “Now!” The corporations are free to do whatever they please with what they get. Nobody is allowed to interfere. Ironically, we are expected to rely on them to find a way out of the crisis we are in. This puts the entire globe at risk since responsibility is something the corporations do not have or know. The times of social contracts are gone.[55] In fact, pointing out the crisis alone has become a crime and all critique will soon be defined as “terror” and persecuted as such.[56] IMF Economic Medicine Since the 1980s, it is mainly the Structural Adjustment Programs (SAPs) of the World Bank and the IMF that act as the enforcers of neoliberalism. These programs are levied against the countries of the South which can be extorted due to their debts. Meanwhile, numerous military interventions and wars help to take possession of the assets that still remain, secure resources, install neoliberalism as the global economic politics, crush resistance movements (which are cynically labeled as “IMF uprisings”), and facilitate the lucrative business of reconstruction.[57] In the 1980s, Ronald Reagan and Margaret Thatcher introduced neoliberalism in Anglo-America. In 1989, the so-called “Washington Consensus” was formulated. It claimed to lead to global freedom, prosperity and economic growth through “deregulation, liberalization and privatization”. This has become the credo and promise of all neoliberals. Today we know that the promise has come true for the corporations only – not for anybody else. In the Middle East, the Western support for Saddam Hussein in the war between Iraq and Iran in the 1980s, and the Gulf War of the early 1990s, announced the permanent U.S. presence in the world’s most contested oil region. In continental Europe, neoliberalism began with the crisis in Yugoslavia caused by the Structural Adjustment Programs (SAPs) of the World Bank and the IMF. The country was heavily exploited, fell apart and finally beset by a civil war over its last remaining resources.[58] Since the NATO war in 1999, the Balkans are fragmented, occupied and geopolitically under neoliberal control.[59] The region is of main strategic interest for future oil and gas transport from the Caucasus to the West (for example the “Nabucco” gas pipeline that is supposed to start operating from the Caspian Sea through Turkey and the Balkans by 2011.[60] The reconstruction of the Balkans is exclusively in the hands of Western corporations. All governments, whether left, right, liberal or green, accept this. There is no analysis of the connection between the politics of neoliberalism, its history, its background and its effects on Europe and other parts of the world. Likewise, there is no analysis of its connection to the new militarism.

### Adv 3-Climate Change

#### Space tourism will soon skyrocket. It causes debris that is systematically destroying the upper atmosphere and ozone layer – key causes of pollution and climate change.

**Pultarova 21**

(Tereza is a London-based science and technology journalist, aspiring fiction writer and amateur gymnast. Originally from Prague, the Czech Republic, she spent the first seven years of her career working as a reporter, script-writer and presenter for various TV programmes of the Czech Public Service Television. She later took a career break to pursue further education and added a Master's in Science from the International Space University, France, to her Bachelor's in Journalism and Master's in Cultural Anthropology from Prague's Charles University. She worked as a reporter at the Engineering and Technology magazine, freelanced for a range of publications including Live Science, Space.com, Professional Engineering, Via Satellite and Space News and served as a maternity cover science editor at the European Space Agency.) Tereza Pultarova 21, 7-26-2021, "The rise of space tourism could affect Earth's climate in unforeseen ways, scientists worry," Space, https://www.space.com/environmental-impact-space-tourism-flights //GHS CR

According to Dallas Kasaboski, principal analyst at the space consultancy Northern Sky Research, a single Virgin Galactic suborbital space tourism flight, lasting about an hour and a half, can generate as much pollution as a 10-hour trans-Atlantic flight. Some scientists consider that disconcerting, in light of Virgin Galactic’s ambitions to fly paying tourists to the edge of space several times a day. "Even if the suborbital tourism market is launching at a fraction of the number of launches compared to the rest of the [tourism] industry, each of their flights has a much higher contribution, and that could be a problem," Kasaboski told Space.com. Virgin Galactic's rockets are, of course, not the only culprits. All rocket motors burning hydrocarbon fuels generate soot, Maggi said. Solid rocket engines, such as those used in the past in the boosters of NASA's [space shuttle](https://www.space.com/16726-space-shuttle.html), burn metallic compounds and emit aluminum oxide particles together with hydrochloric acid, both of which have a damaging effect on the atmosphere. The BE-3 engine that powers Blue Origin's New Shepard suborbital vehicle, on the other hand, combines liquid hydrogen and liquid oxygen to create thrust. The BE-3 is not a big polluter compared to other rocket engines, emitting mainly water along with some minor combustion products, [experts say](https://www.livescience.com/new-shepard-emissions.html). Rockets pollute the otherwise pristine upper layers of the atmosphere. (Image credit: NASA) Too little is known For Karen Rosenlof, senior scientist at the Chemical Sciences Laboratory at the U.S. National Oceanic and Atmospheric Administration (NOAA), the biggest problem is that rockets pollute the higher layers of the atmosphere — the stratosphere, which starts at an altitude of about 6.2 miles (10 kilometers), and the mesosphere, which goes upward from 31 miles (50 km). "You are emitting pollutants in places where you don't normally emit it," Rosenlof told Space.com. "We really need to understand. If we increase these things, what is the potential damage?" So far, the impact of rocket launches on the atmosphere has been negligible, according to Martin Ross, an atmospheric scientist at the Aerospace Corporation who often works with Rosenlof. But that's simply because there have not been that many launches. "The amount of fuel currently burned by the space industry is less than 1% of the fuel burned by aviation," Ross told Space.com. "So there has not been a lot of research, and that makes sense. But things are changing in a way that suggests that we should learn about this in more detail." Northern Sky Research predicts that the number of space tourism flights will skyrocket over the next decade, from maybe 10 a year in the near future to 360 a year by 2030, Kasaboski said. This estimate is still far below the growth rate that space tourism companies like Virgin Galactic and [Blue Origin](https://www.space.com/topics/blue-origin) envision for themselves. "Demand for suborbital tourism is extremely high," Kasaboski said. "These companies virtually have customers waiting in a line, and therefore they want to scale up. Ultimately, they would want to fly multiple times a day, just like short-haul aircraft do." The rate of rocket launches delivering satellites into orbit is expected to grow as well. But Kasaboski sees bigger potential for growth in space tourism. "It's like the difference between a cargo flight and a passenger flight," Kasaboski said. "There's a lot more passengers that are looking to fly." The problem is, according to Ross, that the scientific community has no idea and not enough data to tell at what point rocket launches will start having a measurable effect on the planet's climate. At the same time, the stratosphere is already changing as the number of rocket launches sneakily grows. "The impacts of these [rocket-generated] particles are not well understood even to an order of magnitude, the factor of 10," Ross said. "The uncertainty is large, and we need to narrow that down and predict how space might be impacting the atmosphere." Solid rocket boosters, such as those used in the past to launch NASA's space shuttle, generate ozone-damaging substances. (Image credit: NASA/Bill Ingalls) Space shuttle's ozone holes So far, the only direct measurements of the effects of rocket launches on chemical processes in the atmosphere come from the space shuttle era. In the 1990s, as the world was coming together to salvage the [damaged ozone layer](https://www.space.com/39315-nasa-satellite-shows-healing-ozone-hole.html), NASA, NOAA and the U.S. Air Force put together a campaign that looked at the effects of the emissions from the space shuttle's solid fuel boosters on ozone in the stratosphere. "In the 1990s, there were significant concerns about chlorine from solid rocket motors," Ross said. "Chlorine is the bad guy to ozone in the stratosphere, and there were some models which suggested that ozone depletion from solid rocket motors would be very significant." The scientists used NASA's [WB 57](https://www.nasa.gov/centers/langley/multimedia/iotw-wb57.html) high-altitude aircraft to fly through the plumes generated by the space shuttle rockets in Florida. Reaching altitudes of up to 60,000 feet (19 km), they were able to measure the chemical reactions in the lower stratosphere just after the rockets' passage. "One of the fundamental questions was how much chlorine is being made in these solid rocket motors and in what form," David Fahey, the director of the Chemical Sciences Laboratory at NOAA, who led the study, told Space.com. "We measured it several times and then analyzed the results. At that time, there were not enough space shuttle launches to make a difference globally, but locally one could deplete the ozone layer due to this diffuse plume [left behind by the rocket]." The space shuttle retired 10 years ago, but rockets generating ozone-damaging substances continue launching humans and satellites to space today. In fact, in 2018, in its latest [Scientific Assessment of Ozone Depletion](https://csl.noaa.gov/assessments/ozone/2018/), which comes out every four years, the World Meteorological Organization included rockets as a potential future concern. The organization called for more research to be done as the number of launches is expected to increase. Rocket planes inject pollutants into very high altitudes. (Image credit: Virgin Galactic) Worse than geoengineering Rosenlof's team studies the broader effects of human-made substances in the higher layers of the atmosphere using powerful NOAA supercomputers. The work is akin to predicting the proverbial butterfly effect, the influence of minuscule changes in the chemistry of the air tens of miles above Earth on climate and weather patterns on the ground. For her, black carbon, or soot, emitted by rockets burning hydrocarbon fuels, is of particular concern. "The problem with soot is that it absorbs ultraviolet light, and that means that it could heat the stratosphere," Rosenlof said. "When you start heating the stratosphere, the layer above the troposphere [closest to the ground], you start changing the motion in the stratosphere. You are changing the energy transfer, and that could actually affect what is happening on the ground." Rosenlof points out that many of the particles generated by some rockets have been of interest to scientists due to the possible effects they could have on the global climate in a different context — that of [geoengineering](https://www.space.com/36431-harvard-researchers-geoengineer-earth-atmosphere.html), the deliberate tampering with the atmosphere with the aim of stopping or mitigating global warming. Rosenlof [recently co-authored a paper](https://www.space.com/self-levitating-soot-geoengineering-fights-global-warming) that used the same powerful NOAA supercomputers to model what the scientists call a climate intervention. The team was interested in the climate effects of dispersing sulfur dioxide particles, which are known to reflect light away from Earth, in combination with soot (which is also part of rocket emissions) in the lower stratosphere. Soot absorbs energy from sunlight and pushes the sulfur dioxide aerosol particles to a higher altitude by warming up the surrounding air. At that higher altitude, the sulfur dioxide can start its climate-cooling work. The experiment modeled what would happen when 1.1 million tons of sunlight-reflecting sulfur dioxide mixed with 11,000 tons of black carbon were released in the upper troposphere by aircraft over a 10-day period. The study didn't find any significant negative effects on weather on Earth. Yet, those results do not dispel Rosenlof's concerns about the possible risks associated with the growing number of rocket launches. Altering the jet stream "Black carbon in the geoengineering experiment that we did isn't as high as the stuff from these rockets," she said. "The problem is that the higher you go, the longer something lasts. Neither of them is ideal, because either of them would produce heating in places where we don't have heating right now." According to Maggi, the soot particles generated by hybrid rocket engines are extremely small and light-weight. In fact, when he and his colleagues tried to measure the soot output of hybrid rocket engines in a laboratory, they couldn't reliably do it with precision because of the particles' minuscule size. "We were able to measure the particle output from solid rocket motors," Maggi said. "These are about a micron in size, and there [are] a lot of them. But because they are large, they fall to the ground more quickly. In hybrid rocket engines, we were not able to collect the soot from the plume because it's extremely fine, a few nanometres in size." Maggi fears these particles could, in fact, stay in the stratosphere forever. "They have the same size as the carbon emitted by aircrafts," Maggi said. "And we know that there is a layer of carbon in the atmosphere at the flight level of aircrafts which is staying there. It's very likely that particles coming from rocket motors will do the same." The accumulation of these particles over years and decades is what worries the scientists. Just as the current climate crisis started relatively slowly as the amount of carbon released into the atmosphere grew, the pollution in the stratosphere may only start causing harm some years down the road. Rosenlof added that in the long term, injecting pollutants into the stratosphere could alter the polar jet stream, change winter storm patterns or affect average rainfall. "You might go from 25 inches [64 centimeters] a year to 20 inches [51 cm] a year in some places, which maybe doesn't sound like that big of a deal unless you are a farmer trying to grow your wheat right there," Rosenlof said. "Then a subtle change in rainfall can impact your crop yields." Work to be done For this reason, Fahey says, it is critical that scientific work starts now to evaluate the future risks. "There is this fundamental gap where we just don't have the numbers, and that means that the science is limited because we have this lack of information," he said. "We feel it is part of our responsibility [at NOAA] to assess the impact of human activity on the stratosphere. Rockets are a principal and unique source [of stratospheric pollution], the launch frequencies are increasing and the effects are accumulating." Fahey envisions a wider research program that would analyze the emissions and impacts of individual types of rocket engines and fuels on the stratosphere. The data could be used in Rosenlof's models to better predict the effects in accordance with the expected growth of the number of launches. Fahey, however, says that a political decision would have to come first to provide NOAA and its partners with funding that would enable them to take the high-altitude aircraft to the sky again and gather the data. The good news is, he added, that the U.S. Congress seems to be aware of the problem and things might soon start to move. "We would like to see a national program run by NOAA or the Air Force that would develop a database with basic emission characteristics of modern propulsion systems based on observations," he said. "We could gather some data in ground tests but also in the same way that we did with the space shuttle — by flying through the plumes just after launch."

John Letzing, 21 - ("How many space launches does it take to have a climate impact?," World Economic Forum, 7-23-2021, 12-15-2021https://www.weforum.org/agenda/2021/07/what-s-the-climate-impact-of-space-exploration/)//AW

A new satellite launch site is planned for Unst, a windswept UK island that was once part of a ring of radar stations used to detect incoming V-2 rockets – the German “wonder weapons” that spawned a government-led space race more than a half-century ago. According to one assessment, launches at the facility in Unst, designed to cater to commercial clients, would result in 764 tonnes of carbon dioxide equivalent annually. That's a negligible fraction of the country’s total emissions last year. But the site is just one of seven planned for the UK alone, as a largely profit-driven second space race heats up. Space launches haven’t raised much climate concern to date. That may change as the private sector books an increasing number of flights for space tourists, and potentially starts ferrying miners and factory workers beyond Earth’s atmosphere (two successful commercial voyages to space this month both inspired would-be explorers and prompted some pundits to calculate their carbon footprint). Alongside space tourism, the growing use of satellites will also likely ramp up launch activity; a record 1,283 satellites were launched last year, according to the UN, and by April of this year nearly 850 more had been sent into space. In addition to coughing up not-inconsiderable amounts of CO2, rockets can spew exhaust that depletes the ozone layer through chemical reactions. And if the black carbon “soot” particles they leave in the atmosphere reach high enough concentrations, it could impact surface and atmospheric temperatures, according to a NASA assessment. One study estimated that 1,000 space launches per year could create a layer of black carbon particles capable of causing the loss of 5% or more of Antarctic sea ice. As private commercial interest in space increases, a wider variety of governments are also likely to initiate launches. More than a dozen countries now have the ability to send objects into orbit, and related costs have generally declined since 2005. Nations submitting information to the UN on their first satellites in 2019 included Bhutan and Kenya; Indonesia, Lithuania, and Egypt were among the other countries registering functional space objects that year. China now has a space station where it can send additional astronauts and supplies, and the United Arab Emirates plans to follow its successful launch of a Mars orbiter with a satellite-manufacturing complex and a settlement on the Red Planet by 2117. Not long before the private-sector launches this month stirred excitement about new possibilities for spaceflight, an extreme heatwave linked to climate change had blanketed the region from Texas north to Canada – killing hundreds of people, cooking millions of sea creatures, and hinting that an environmental catastrophe may be closer at hand than anticipated. Some argue greater access to space means we could send the most climate-unfriendly aspects of the global economy there. Others say we must find better ways to deal with the problem right here on Earth.

#### Privatization of space will cause Climate Change long before we have a solution - Judge vote on timeframe

John **Letzing, 21** - ("How many space launches does it take to have a climate impact?," World Economic Forum, 7-23-2021, 12-15-2021https://www.weforum.org/agenda/2021/07/what-s-the-climate-impact-of-space-exploration/)//AW

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#### Climate change is responsible for devastating consequences that target marginalized populations in developing countries

(Abrahm **Lustgarten, 2020**- senior environmental reporter at ProPublica, “HOW CLIMATE MIGRATION WILL RESHAPE AMERICA,” 15 September 2020, New York Times, https://www.nytimes.com/interactive/2020/09/15/magazine/climate-crisis-migration-america.html)//ak//

August besieged **California** with a heat unseen in generations. A surge in air-conditioning broke the state’s electrical grid, leaving a population already ravaged by the coronavirus to work remotely by the dim light of their cellphones. By midmonth, the state had **recorded** possibly **the hottest temperature ever measured on earth — 130 degrees in Death Valley** — and an otherworldly storm of lightning had cracked open the sky. From Santa Cruz to Lake Tahoe, thousands of bolts of electricity exploded down onto withered grasslands and forests, some of them already hollowed out by climate-driven infestations of beetles and kiln-dried by the worst five-year drought on record. Soon, **California was on fire.** Over the next two weeks, 900 blazes incinerated six times as much land as all the state’s 2019 wildfires combined, forcing 100,000 people from their homes. Three of the largest fires in history burned simultaneously in a ring around the San Francisco Bay Area. Another fire burned just 12 miles from my home in Marin County. I watched as towering plumes of smoke billowed from distant hills in all directions and air tankers crisscrossed the skies. Like many Californians, I spent those weeks worrying about what might happen next, wondering how long it would be before an inferno of 60-foot flames swept up the steep, grassy hillside on its way toward my own house, rehearsing in my mind what my family would do to escape. But I also had a longer-term question, about what would happen once this unprecedented fire season ended. Was it finally time to leave for good? I had an unusual perspective on the matter. For two years, I have been studying how climate change will influence global migration. My sense was that **of all the devastating consequences of a warming planet** — changing landscapes, pandemics, mass extinctions — [**the potential movement of hundreds of millions of climate refugees across the planet**](https://www.nytimes.com/interactive/2020/07/23/magazine/climate-migration.html) **stands to be among the most important**. I traveled across four countries to witness how rising temperatures were driving climate refugees away from some of the poorest and hottest parts of the world. I had also helped create an enormous computer simulation to analyze how global demographics might shift, and now I was working on a data-mapping project about migration here in the United States. So it was with some sense of recognition that I faced the fires these last few weeks. In recent years, summer has brought a season of fear to California, with ever-worsening wildfires closing in. But this year felt different. The hopelessness of the pattern was now clear, and the pandemic had already uprooted so many Americans. Relocation no longer seemed like such a distant prospect. Like the subjects of my reporting, climate change had found me, its indiscriminate forces erasing all semblance of normalcy. Suddenly I had to ask myself the very question I’d been asking others: Was it time to move? I am far from the only American facing such questions**. This summer has seen more fires, more heat, more storms — all of it making life increasingly untenable** in larger areas of the nation. Already, **droughts** regularly **threaten** food c**rops across the West, while destructive floods inundate towns and fields from the Dakotas to Maryland,** [collapsing dams in Michigan](https://www.nytimes.com/2020/05/21/climate/dam-failure-michigan-climate-change.html) and [raising the shorelines of the Great Lakes](https://www.nytimes.com/2019/08/24/us/great-lakes-water-levels.html#:~:text=Though%20water%20levels%20have%20always,warmer%20temperatures%20and%20increased%20evaporation.&text=MICH.,-CANADA). **Rising seas and increasingly violent hurricanes are making thousands of miles of American shoreline nearly uninhabitable**. As California burned, Hurricane Laura pounded the Louisiana coast with 150-mile-an-hour winds, killing at least 25 people; it was the 12th named storm to form by that point in 2020, another record. Phoenix, meanwhile, endured 53 days of 110-degree heat — 20 more days than the previous record. For years, Americans have avoided confronting these changes in their own backyards. The decisions we make about where to live are distorted not just by politics that play down climate risks, but also by expensive subsidies and incentives aimed at defying nature. In much of the developing world, vulnerable people will attempt to flee the emerging perils of global warming, seeking cooler temperatures, more fresh water and safety. But here **in the United States, people have largely gravitated toward environmental danger, building along coastlines** from New Jersey to Florida and settling across the cloudless deserts of the Southwest. I wanted to know if this was beginning to change. Might Americans finally be waking up to how climate is about to transform their lives? And if so — if a great domestic relocation might be in the offing — was it possible to project where we might go? To answer these questions**, I interviewed more than four dozen experts: economists and demographers, climate scientists and insurance executives, architects and urban planners, and I mapped out the danger zones that will close in on Americans over the next 30 years.** The maps for the first time combined exclusive climate data from the Rhodium Group, an independent data-analytics firm; wildfire projections modeled by United States Forest Service researchers and others; and data about America’s shifting climate niches, an evolution of work first published by The Proceedings of the National Academy of Sciences last spring. (See a detailed analysis of the maps.) What I found was a nation on the cusp of a great transformation. Across the United States, some **162 million people** — nearly one in two — **will** most likely **experience a decline in the quality of their environment, namely more heat and less water**. For 93 million of them, the changes could be particularly severe, and by 2070, our analysis suggests, if carbon emissions rise at extreme levels, at least four million Americans could find themselves living at the fringe, in places decidedly outside the ideal niche for human life. **The cost of resisting the new climate reality is mounting.** Florida officials have already acknowledged that defending some roadways against the sea will be unaffordable. And the nation’s federal flood-insurance program is for the first time requiring that some of its payouts be used to retreat from climate threats across the country. It will soon prove too expensive to maintain the status quo. By 2070, some 28 million people across the country could face Manhattan-size megafires. In Northern California, they could become an annual event. Then what? One influential 2018 study, published in The Journal of the Association of Environmental and Resource Economists, suggests **that one in 12 Americans in the Southern half of the country will move toward California, the Mountain West or the Northwest** over the next 45 years because of climate influences alone. **Such a shift** in population **is likely to increase poverty and widen the gulf between the rich and the poor. It will accelerate rapid**, perhaps chaotic, **urbanization of cities ill-equipped for the burden, testing their capacity to provide basic services** and amplifying existing inequities. **It will** eat away at prosperity, **deal**ing **repeated economic blows to coastal**, rural and Southern **regions**, **which could in turn push entire communities to the brink of collapse. This** process **has already begun in** rural **Louisiana and** coastal **Georgia, where low-income and Black and Indigenous communities face environmental change on top of poor health and extreme poverty**. Mobility itself, global-migration experts point out, is often a reflection of relative wealth, and as some move, **many** others **will be left behind.** Those who stay risk becoming trapped as the land and the society around them ceases to offer any more support. There are signs that the message is breaking through. Half of Americans now rank climate as a top political priority, up from roughly one-third in 2016, and three out of four now describe climate change as either “a crisis” or “a major problem.” This year, Democratic caucusgoers in Iowa, where tens of thousands of acres of farmland flooded in 2019, ranked climate second only to health care as an issue. A poll by researchers at Yale and George Mason Universities found that even Republicans’ views are shifting: One in three now think climate change should be declared a national emergency. **Policymakers**, having left America unprepared for what’s next, now **face brutal choices about which communities to save** — often at exorbitant costs — **and which to sacrifice. Their decisions will** almost inevitably make the nation more **divide**d, **with those worst off relegated to a nightmare future** in which they are left to fend for themselves. Nor will these disruptions wait for the worst environmental changes to occur. **The wave begins when individual perception of risk starts to shift**, when the environmental threat reaches past the least fortunate and rattles the physical and financial security of broader, wealthier parts of the population. It begins when even places like California’s suburbs are no longer safe. **It has already begun**. Let’s start with some basics. Across the country, it’s going to get hot. Buffalo may feel in a few decades like Tempe, Ariz., does today, and Tempe itself will sustain 100-degree average summer temperatures by the end of the century**. Extreme humidity** from New Orleans to northern Wisconsin **will** make summers increasingly unbearable, **turn**ing otherwise seemingly survivable **heat waves into debilitating health threats.** **Fresh water will** also **be in short supply**, not only in the West but also in places like Florida, Georgia and Alabama, where droughts now regularly wither cotton fields. **By 2040**, according to federal government projections, **extreme water shortages will be** nearly **ubiquitous** west of Missouri. The Memphis Sands Aquifer, a crucial water supply for Mississippi, Tennessee, Arkansas and Louisiana, is already overdrawn by hundreds of millions of gallons a day. Much of the Ogallala Aquifer — which supplies nearly a third of the nation’s irrigation groundwater — could be gone by the end of the century. **It can be difficult to see the challenges clearly because so many factors are in play**. At least **28 million Americans are likely to face megafires** like the ones we are now seeing in California, in places like Texas and Florida and Georgia. At the same time, **100 million Americans** — largely in the Mississippi River Basin from Louisiana to Wisconsin — **will increasingly face humidity so extreme that working outside** or playing school sports **could cause heatstroke. Crop yields will be decimated** from Texas to Alabama and all the way north through Oklahoma and Kansas and into Nebraska. **The challenges are so widespread and so interrelated that Americans seeking to flee one could well run into another.** I live on a hilltop, 400 feet above sea level, and my home will never be touched by rising waters. But by the end of this century, if the more extreme projections of eight to 10 feet of sea-level rise come to fruition, the shoreline of San Francisco Bay will move three miles closer to my house, as it subsumes some 166 square miles of land, including a high school, a new county hospital and the store where I buy groceries. The freeway to San Francisco will need to be raised, and to the east, a new bridge will be required to connect the community of Point Richmond to the city of Berkeley. The **Latino, Asian and Black communities who live in the most-vulnerable low-lying districts will be displaced first**, but research from Mathew Hauer, a sociologist at Florida State University who published some of the first modeling of American climate migration in the journal Nature Climate Change in 2017, suggests that the toll will eventually be far more widespread: Nearly one in three people here in Marin County will leave, part of the roughly 700,000 who his models suggest may abandon the broader Bay Area as a result of sea-level rise alone. From Maine to North Carolina to Texas, **rising sea levels are not just chewing up shorelines but** also **raising rivers and swamping** the subterranean **infrastructure** of coastal communities, making a stable life there all but impossible. Coastal high points will be cut off from roadways, amenities and escape routes, and even far inland, saltwater will seep into underground drinking-water supplies. Eight of the nation’s 20 largest metropolitan areas — Miami, New York and Boston among them — will be profoundly altered, indirectly affecting some 50 million people. Imagine large concrete walls separating Fort Lauderdale condominiums from a beachless waterfront, or dozens of new bridges connecting the islands of Philadelphia. Not every city can spend $100 billion on a sea wall, as New York most likely will. Barrier islands? Rural areas along the coast without a strong tax base? They are likely, in the long term, unsalvageable. In all, Hauer projects that 13 million Americans will be forced to move away from submerged coastlines. Add to that the people contending with wildfires and other risks, and the number of Americans who might move — though difficult to predict precisely — could easily be tens of millions larger. Even 13 million climate migrants, though, would rank as the largest migration in North American history. The Great Migration — of six million Black Americans out of the South from 1916 to 1970 — transformed almost everything we know about America, from the fate of its labor movement to the shape of its cities to the sound of its music. What would it look like when twice that many people moved? What might change? Americans have been conditioned not to respond to geographical climate threats as people in the rest of the world do. It is natural that rural Guatemalans or subsistence farmers in Kenya, facing drought or scorching heat, would seek out someplace more stable and resilient. Even a subtle environmental change — a dry well, say — can mean life or death, and without money to address the problem, migration is often simply a question of survival. By comparison, **Americans** are richer, often much richer, and more insulated from the shocks of climate change. They **are distanced from the food and water sources they depend on, and they are part of a culture that sees every problem as capable of being solved by money. So even as the average flow of the Colorado River — the water supply for 40 million Western Americans and the backbone of the nation’s vegetable and cattle farming** — has declined for most of the last 33 years, the population of Nevada has doubled. At the same time, **more than 1.5 million people have moved to the Phoenix metro area, despite its dependence on that same river** (and the fact that temperatures there now regularly hit 115 degrees). Since Hurricane Andrew devastated Florida in 1992 — and even as that state has become a global example of the threat of sea-level rise — more than five million people have moved to Florida’s shorelines, driving a historic boom in building and real estate. The sense that money and technology can overcome nature has emboldened Americans. Where money and technology fail, though, it inevitably falls to government policies — and government subsidies — to pick up the slack. Thanks to federally subsidized canals, for example, water in part of the Desert Southwest costs less than it does in Philadelphia. The federal National Flood Insurance Program has paid to rebuild houses that have flooded six times over in the same spot. And federal agriculture aid withholds subsidies from farmers who switch to drought-resistant crops, while paying growers to replant the same ones that failed. Farmers, seed manufacturers, real estate developers and a few homeowners benefit, at least momentarily, but the gap between what the climate can destroy and what money can replace is growing. Perhaps no market force has proved more influential — and more misguided — than the nation’s property-insurance system. From state to state, readily available and affordable policies have made it attractive to buy or replace homes even where they are at high risk of disasters, systematically obscuring the reality of the climate threat and fooling many Americans into thinking that their decisions are safer than they actually are. Part of the problem is that most policies look only 12 months into the future, ignoring long-term trends even as insurance availability influences development and drives people’s long-term decision-making. Even where insurers have tried to withdraw policies or raise rates to reduce climate-related liabilities, state regulators have forced them to provide affordable coverage anyway, simply subsidizing the cost of underwriting such a risky policy or, in some cases, offering it themselves. The regulations — called Fair Access to Insurance Requirements — are justified by developers and local politicians alike as economic lifeboats “of last resort” in regions where climate change threatens to interrupt economic growth. While they do protect some entrenched and vulnerable communities, the laws also satisfy the demand of wealthier homeowners who still want to be able to buy insurance. At least 30 states, including Louisiana, Massachusetts, North Carolina and Texas, have developed so-called FAIR plans, and today they serve as a market backstop in the places facing the highest risks of climate-driven disasters, including coastal flooding, hurricanes and wildfires. In an era of climate change, though, such policies amount to a sort of shell game, meant to keep growth going even when other obvious signs and scientific research suggest that it should stop. That’s what happened in Florida. Hurricane Andrew reduced parts of cities to landfill and cost insurers nearly $16 billion in payouts. Many insurance companies, recognizing the likelihood that it would happen again, declined to renew policies and left the state. So the Florida Legislature created a state-run company to insure properties itself, preventing both an exodus and an economic collapse by essentially pretending that the climate vulnerabilities didn’t exist. As a result, Florida’s taxpayers by 2012 had assumed liabilities worth some $511 billion — more than seven times the state’s total budget — as the value of coastal property topped $2.8 trillion. Another direct hurricane risked bankrupting the state. Florida, concerned that it had taken on too much risk, has since scaled back its self-insurance plan. But the development that resulted is still in place. On a sweltering afternoon last October, with the skies above me full of wildfire smoke, I called Jesse Keenan, an urban-planning and climate-change specialist then at Harvard’s Graduate School of Design, who advises the federal Commodity Futures Trading Commission on market hazards from climate change. Keenan, who is now an associate professor of real estate at Tulane University’s School of Architecture, had been in the news last year for projecting where people might move to — suggesting that Duluth, Minn., for instance, should brace for a coming real estate boom as climate migrants move north. But like other scientists I’d spoken with, Keenan had been reluctant to draw conclusions about where these migrants would be driven from. Last fall, though, as the previous round of fires ravaged California, his phone began to ring, with private-equity investors and bankers all looking for his read on the state’s future. Their interest suggested a growing investor-grade nervousness about swiftly mounting environmental risk in the hottest real estate markets in the country. It’s an early sign, he told me, that the momentum is about to switch directions. “And **once this flips**,” he added, “**it’s likely to flip very quickly.”** In fact, the correction — a newfound respect for the destructive power of nature, coupled with a sudden disavowal of Americans’ appetite for reckless development — had begun two years earlier, when a frightening surge in disasters offered a jolting preview of how the climate crisis was changing the rules. On October 9, 2017, a wildfire blazed through the suburban blue-collar neighborhood of Coffey Park in Santa Rosa, Calif., virtually in my own backyard. I awoke to learn that more than 1,800 buildings were reduced to ashes, less than 35 miles from where I slept. Inchlong cinders had piled on my windowsills like falling snow. The Tubbs Fire, as it was called, shouldn’t have been possible. Coffey Park is surrounded not by vegetation but by concrete and malls and freeways. So insurers had rated it as “basically zero risk,” according to Kevin Van Leer, then a risk modeler from the global insurance liability firm Risk Management Solutions. (He now does similar work for Cape Analytics.) But Van Leer, who had spent seven years picking through the debris left by disasters to understand how insurers could anticipate — and price — the risk of their happening again, had begun to see other “impossible” fires. After a 2016 fire tornado ripped through northern Canada and a firestorm consumed Gatlinburg, Tenn., he said, “alarm bells started going off” for the insurance industry. What Van Leer saw when he walked through Coffey Park a week after the Tubbs Fire changed the way he would model and project fire risk forever. Typically, fire would spread along the ground, burning maybe 50 percent of structures. In Santa Rosa, more than 90 percent had been leveled. “The destruction was complete,” he told me. Van Leer determined that **the fire had jumped through the forest canopy, spawning 70-mile-per-hour winds that kicked a storm of embers into the modest homes of Coffey Park, which burned at an acre a second as homes ignited spontaneously from the radiant heat. It was the kind of thing that might never have been possible if California’s autumn winds weren’t getting fiercer and drier every year, colliding with intensifying, climate-driven heat and ever-expanding development. “It’s hard to forecast something you’ve never seen before,**” he said. For me, **the awakening to imminent climate risk** came with California’s rolling power blackouts last fall — an effort to pre-emptively avoid the risk of a live wire sparking a fire — which **show**ed me that all my notional perspective about **climate risk and** my own **life choices** were **on a collision course**. After the first one, all the food in our refrigerator was lost. When power was interrupted six more times in three weeks, we stopped trying to keep it stocked. All around us, small fires burned. Thick smoke produced fits of coughing. Then, as now, I packed an ax and a go-bag in my car, ready to evacuate. As former Gov. Jerry Brown said, it was beginning to feel like the “new abnormal.” It was no surprise, then, that California’s property insurers — having watched 26 years’ worth of profits dissolve over 24 months — began dropping policies, or that California’s insurance commissioner, trying to slow the slide, placed a moratorium on insurance cancellations for parts of the state in 2020. In February, the Legislature introduced a bill compelling California to, in the words of one consumer advocacy group, “follow the lead of Florida” by mandating that insurance remain available, in this case with a requirement that homeowners first harden their properties against fire. At the same time, participation in California’s FAIR plan for catastrophic fires has grown by at least 180 percent since 2015, and in Santa Rosa, houses are being rebuilt in the very same wildfire-vulnerable zones that proved so deadly in 2017. Given **that a new study projects a 20 percent increase in extreme-fire-weather days by 2035**, such practices suggest a special form of climate negligence. It’s only a matter of time before homeowners begin to recognize the unsustainability of this approach. Market shock, when driven by the sort of cultural awakening to risk that Keenan observes, can strike a neighborhood like an infectious disease, with fear spreading doubt — and devaluation — from door to door. It happened that way in the foreclosure crisis. By 2060 in Florida and elsewhere, the costs of sea-level rise and hurricanes will be compounded by knock-on economic challenges, from growing crime to falling productivity. Keenan calls the practice of drawing arbitrary lending boundaries around areas of perceived environmental risk “bluelining,” and indeed many of the neighborhoods that banks are bluelining are the same as the ones that were hit by the racist redlining practice in days past. This summer, climate-data analysts at the First Street Foundation released maps showing that **70 percent more buildings in the United States were vulnerable to flood risk than previously thought; most of the underestimated risk was in low-income neighborhoods**. Such neighborhoods see little in the way of flood-prevention investment. My Bay Area neighborhood, on the other hand, has benefited from consistent investment in efforts to defend it against the ravages of climate change. That questions of livability had reached me, here, were testament to Keenan’s belief that the bluelining phenomenon will eventually affect large majorities of equity-holding middle-class Americans too, with broad implications for the overall economy, starting in the nation’s largest state. Under the radar**, a new class of dangerous debt — climate-distressed mortgage loans — might already be threatening the financial system.** Lending data analyzed by Keenan and his co-author, Jacob Bradt, for a study published in the journal Climatic Change in June shows that small **banks are liberally making loans on environmentally threatened homes, but then quickly passing them along to federal mortgage backers**. At the same time, they have all but stopped lending money for the higher-end properties worth too much for the government to accept, suggesting that the banks are knowingly passing climate liabilities along to taxpayers as stranded assets. Once home values begin a one-way plummet, it’s easy for economists to see how entire communities spin out of control. The tax base declines and the school system and civic services falter, creating a negative feedback loop that pushes more people to leave. Rising insurance costs and the perception of risk force credit-rating agencies to downgrade towns, making it more difficult for them to issue bonds and plug the springing financial leaks. Local banks, meanwhile, keep securitizing their mortgage debt, sloughing off their own liabilities. Keenan, though, had a bigger point: All the structural disincentives that had built Americans’ irrational response to the climate risk were now reaching their logical endpoint**. A pandemic-induced economic collapse will** only **heighten** the vulnerabilities **and speed the transition**, reducing to nothing whatever thin margin of financial protection has kept people in place. Until now, the market mechanisms had essentially socialized the consequences of high-risk development. But as the costs rise — and the insurers quit, and the bankers divest, and the farm subsidies prove too wasteful, and so on **— the full weight of responsibility will fall on individual people**. And that’s when the real migration might begin. As I spoke with Keenan last year, I looked out my own kitchen window onto hillsides of parkland, singed brown by months of dry summer heat. This was precisely the land that my utility, Pacific Gas & Electric, had three times identified as such an imperiled tinderbox that it had to shut off power to avoid fire. It was precisely the kind of wildland-urban interface that all the studies I read blamed for heightening Californians’ exposure to climate risks. I mentioned this on the phone and then asked Keenan, “Should I be selling my house and getting — ” He cut me off: “Yes.” Americans have dealt with climate disaster before. The Dust Bowl started after the federal government expanded the Homestead Act to offer more land to settlers willing to work the marginal soil of the Great Plains. Millions took up the invitation, replacing hardy prairie grass with thirsty crops like corn, wheat and cotton. Then, entirely predictably, came the drought. From 1929 to 1934, crop yields across Texas, Oklahoma, Kansas and Missouri plunged by 60 percent, leaving farmers destitute and exposing the now-barren topsoil to dry winds and soaring temperatures. The resulting dust storms, some of them taller than skyscrapers, buried homes whole and blew as far east as Washington. The disaster propelled an exodus of some 2.5 million people, mostly to the West, where newcomers — “Okies” not just from Oklahoma but also Texas, Arkansas and Missouri — unsettled communities and competed for jobs. Colorado tried to seal its border from the climate refugees; in California, they were funneled into squalid shanty towns. Only after the migrants settled and had years to claw back a decent life did some towns bounce back stronger. The places migrants left behind never fully recovered. Eighty years later, Dust Bowl towns still have slower economic growth and lower per capita income than the rest of the country. **Dust Bowl survivors and their children are less likely to go to college and more likely to live in poverty. Climatic change made them poor, and it has kept them poor ever since. A Dust Bowl event will most likely happen again**. The Great Plains states today provide nearly half of the nation’s wheat, sorghum and cattle and much of its corn; the farmers and ranchers there export that food to Africa, South America and Asia**. Crop yields**, though, **will drop sharply with every degree of warming. By 2050,** researchers at the University of Chicago and the NASA Goddard Institute for Space Studies found**, Dust Bowl-era yields will be the norm**, even as demand for scarce water jumps by as much as 20 percent. **Another extreme drought would drive near-total crop losses worse than the Dust Bowl, kneecapping the broader economy**. At that point, the authors write, “abandonment is one option.” Corn and soy production will decrease with every degree of warming. By 2060, parts of Texas may experience a drop in yields of more than 92 percent. Projections are inherently imprecise, but the gradual changes to America’s cropland — plus the steady baking and burning and flooding — suggest that we are already witnessing a slower-forming but much larger replay of the Dust Bowl that will destroy more than just crops. In 2017, Solomon Hsiang, a climate economist at the University of California, Berkeley, led an analysis of the economic impact of climate-driven changes like rising mortality and rising energy costs, finding that **the poorest counties** in the United States — mostly across the South and the Southwest — **will** in some extreme cases **face damages** equal to **more than a third of their gross domestic products**. The 2018 National Climate Assessment also warns that the U.S. economy over all could contract by 10 percent. That kind of loss typically drives people toward cities, and researchers expect that trend to continue after the Covid-19 pandemic ends. In 1950, less than 65 percent of Americans lived in cities. By 2050, only 10 percent will live outside them, in part because of climatic change. By 2100, Hauer estimates, Atlanta, Orlando, Houston and Austin could each receive more than a quarter million new residents as a result of sea-level displacement alone, meaning it may be those cities — not the places that empty out — that wind up bearing the brunt of America’s reshuffling. The World Bank warns that **fast-moving climate urbanization leads to rising unemployment, competition for services and deepening poverty**. So what will happen to Atlanta — a metro area of 5.8 million people that may lose its water supply to drought and that our data also shows will face an increase in heat-driven wildfires? Hauer estimates that hundreds of thousands of climate refugees will move into the city by 2100, swelling its population and stressing its infrastructure. Atlanta — where poor transportation and water systems contributed to the state’s C+ infrastructure grade last year — already suffers greater income inequality than any other large American city**, making it a virtual tinderbox for social conflict.** One in 10 households earns less than $10,000 a year, and rings of extreme poverty are growing on its outskirts even as the city center grows wealthier. Atlanta has started bolstering its defenses against climate change, but in some cases this has only exacerbated divisions. When the city converted an old Westside rock quarry into a reservoir, part of a larger greenbelt to expand parkland, clean the air and protect against drought, the project also fueled rapid upscale growth, driving the poorest Black communities further into impoverished suburbs. That Atlanta hasn’t “fully grappled with” such challenges now, says Na’Taki Osborne Jelks, chair of the West Atlanta Watershed Alliance, means that with more people and higher temperatures, “the city might be pushed to what’s manageable.” So might Philadelphia, Chicago, Washington, Boston and other cities with long-neglected systems suddenly pressed to expand under increasingly adverse conditions. Once you accept that climate change is fast making large parts of the United States nearly uninhabitable, the future looks like this: With time, **the bottom half of the country grows inhospitable, dangerous and hot.** Something like **a tenth of the people who live in the South** and the Southwest — from South Carolina to Alabama to Texas to Southern California — decide to **move north** in search of a better economy and a more temperate environment. **Those who stay behind are disproportionately poor and elderly**. In these places**, heat alone will cause** as many as **80** additional **deaths per 100,000 people** — the nation’s opioid crisis, by comparison, produces 15 additional deaths per 100,000. **The most affected people, meanwhile, will pay 20 percent more for energy, and their crops will yield half as much food or in some cases virtually none at all**. That collective burden will drag down regional incomes by roughly 10 percent, amounting to one of the largest transfers of wealth in American history, as people who live farther north will benefit from that change and see their fortunes rise. The millions of people moving north will mostly head to the cities of the Northeast and Northwest, which will see their populations grow by roughly 10 percent, according to one model. Once-chilly places like Minnesota and Michigan and Vermont will become more temperate, verdant and inviting. Vast regions will prosper; just as Hsiang’s research forecast that Southern counties could see a tenth of their economy dry up, he projects that others as far as North Dakota and Minnesota will enjoy a corresponding expansion. Cities like Detroit, Rochester, Buffalo and Milwaukee will see a renaissance, with their excess capacity in infrastructure, water supplies and highways once again put to good use. One day, it’s possible that a high-speed rail line could race across the Dakotas, through Idaho’s up-and-coming wine country and the country’s new breadbasket along the Canadian border, to the megalopolis of Seattle, which by then has nearly merged with Vancouver to its north. Sitting in my own backyard one afternoon this summer, my wife and I talked through the implications of this looming American future. The facts were clear and increasingly foreboding. Yet there were so many intangibles — a love of nature, the busy pace of life, the high cost of moving — that conspired to keep us from leaving. Nobody wants to migrate away from home, even when an inexorable danger is inching ever closer. They do it when there is no longer any other choice.