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#### The Committee on the Peaceful use of Outer Space should establish an application system for property rights on celestial bodies conditioned upon open disclosure of data and applications. Private entities will only be granted one property grant per celestial body.

#### The counterplan establishes international norms for safe extraction of resources in outer space.

**Steffen 21** [Olaf Steffen, Olaf is a scientist at the Institute of Composite Structures and Adaptive Sytems at the German Aerospace Center. 12-2-2021, "Explore to Exploit: A Data-Centred Approach to Space Mining Regulation," Institute of Composite Structures and Adaptive Systems, German Aerospace Center, [https://www.sciencedirect.com/science/article/pii/S0265964621000515 accessed 12/12/21](https://www.sciencedirect.com/science/article/pii/S0265964621000515%20accessed%2012/12/21)] Adam

4. The data-centred approach to space mining regulation

4.1. Core description of the regulatory regime and mining rights acquisition process

The data gathered in the exploration of a [celestial body](https://www.sciencedirect.com/topics/social-sciences/astronomical-systems) is not only of value for space mining companies for informing them whether, where and how to exploit resources from the body in question, but also for science. The irretrievability of information relating to the solar system contained in the body that will be lost during resource exploitation carries a value for humanity and future generations and can thus be assigned the characteristic of a common heritage for all mankind as invoked in the Moon Agreement. This characteristic makes exploration data an exceptional and unique candidate for use in a mechanism for acquiring mining rights because its preservation is of public interest and its disclosure in exchange for exclusive mining rights does not place any additional burden on the mining company. The following principles would form the cornerstones of the proposed regulatory regime and rights acquisition mechanism based on exploration data:

Without preconditions, no entity has a right to mine the resources of a celestial body.

An international regulatory body administers the existing rights of companies for mining a specific celestial body.

Mining rights to such bodies can be applied for from this international regulatory body, with applications made public. The application expires after a pre-set period.

Mining rights are granted on the provision and disclosure of exploration data on the celestial body within the pre-set period, proposedly gathered in situ, characterising this body and its resources in a pre-defined manner.

The explorer's mining right to the resources of the celestial body is published by the regulatory body in a mining rights grant.

The data concerning the celestial body are made public as part of the rights grant within the domain of all participating members of the regulatory regime.

The exclusive mining rights to any specific body are tradeable.

The scope of the regulatory body with respect to the granting of mining rights is not revenue-oriented.

The international regulatory body would thus act as a curator of a rights register and an attached database of exploration data. The concept is superficially comparable to patent law, where exclusive rights are granted following the disclosure of an invention to incentivise the efforts made in the development process. In the following section, the characteristics of such a regulatory regime are further discussed with respect to the formation of [monopolies](https://www.sciencedirect.com/topics/social-sciences/monopolies), market dynamics, conflict avoidance, inclusivity towards less developed countries and the viability of implementation.

4.2. Discussion and means of implementation

The proposed regulatory mechanism has advantages both from a business/investor and society perspective. First, it prevents already highly capitalised companies from acquiring exploitation rights in bulk to deny competitors those objects that are easiest to exploit or most valuable, which would otherwise be possible in any kind of pay-for-right mechanism and could result in preventing market access to smaller, emerging companies. Thus, early monopoly formation can be avoided.

The use of data disclosure for the granting of mining rights ensures the scientific community has access to this invaluable source of information. In this way, space mining prospecting missions can lead to a boost in research on small celestial bodies at a speed unmatchable by pure government/agency funded science probes. This usefulness to the scientific community could lead to sustained partnerships between prospecting companies and scientific institutions and could even provide a source of funding for the companies through R&D grants and public-private partnerships. The results of the exploration efforts contribute to research on the formation of planets and the history of the solar system and provide valuable insight for space defence against asteroids. The transition of exploration from a tailored mission profile with a purpose-built spacecraft to a standard task in space flight would also lead to a cost reduction of the respective exploration spacecraft through [economies of scale](https://www.sciencedirect.com/topics/social-sciences/economies-of-scale). This describes the very benefits Elvis [[24](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib24)] and Crawford [[25](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib25)] imagined as possible effects of a space economy. Thus, there is an immediate return for society from the exploitation rights grant. It also reconciles the adverse interests of space development and [space science](https://www.sciencedirect.com/topics/social-sciences/space-sciences) as laid out by Schwartz [[26](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib26)]. It ensures that, by exploitation, information contained in celestial bodies is not lost for future generations.The application period should not be set in a manner that creates a situation that can be abused through the potential for stockpiling inventory rights. Rather, it is intended to prevent conflict in the phase before exploration data gathered by a mission, as a prerequisite to the mining rights grant, is available. In other words, only one exploration effort at a time can be permitted for a specific body. The time frame between the application and the granting of mining rights (meaning: availability of the required exploration data set) should be tight and should only consider necessary exploration time on site, transit time and possibly a reasonable launch preparation and data processing markup. These contributors to the application period make it clear that the time frame could be dynamic and individualistic, depending on the exploration target (transit time and duration of exploration) and the technology of the exploration probe (transit time). After the expiration of the application period, applications for the exploration target would again be permissible. To prevent the previously mentioned stockpiling of inventory rights, credible proof of an imminent exploration intention would need to be part of the application process, for example, a fixed launch contract or the advanced build status of the exploration probe. Such a mechanism would not contradict the statement in the OST that outer space shall be free for both exploration and scientific investigation. Applications would not apply to purely scientific exploration. An application would only be necessary as a prerequisite for mining. Even resource prospecting could take place without an application (for whatever reason), with a subsequent application comprising in situ data already gathered. For such cases, the application process would need to provide a short period for objections to enable the secretive explorer to make their efforts public. The publication of the application for the mining rights, which is nothing more than a statement of intention to explore, thus provides a strong measure for avoiding conflict.

The transparency of where exploration spacecraft are located and, at a later stage, where mining activities take place, provides additional benefits for the sustainable use of space, trust building and deterrence against malign misuse of mining technology. Involuntary spacecraft collisions of competitors in deep space are prevented by the reduction of exploration efforts at the same destination through the application for mining rights by one applicant at a time. As pointed out by Newman and Williamson [[20](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib20)], this is relevant because space debris does not de-orbit in deep space as in the case of LEO. Deep space may be vast, but the velocities involved mean that small debris particles are no less dangerous. Considering NEO mining with fleets of small spacecraft, malfunctions and/or destructive events could create debris clouds crossing Earth's orbit around the sun on a regular basis, presenting another danger to satellites in Earth's own orbit. Thus, by effectively preventing the collision of two spacecraft, one source of debris creation can be mitigated through this regulation mechanism. With respect to Deudney's [[11](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib11)] scepticism of asteroid mining and the dual-use character of technology to manipulate orbits of celestial bodies, it has to be stated that this potential is truly inherent to asteroid mining. An asteroid redirect mission for scientific purposes was pursued by NASA [[49](https://www.sciencedirect.com/science/article/pii/S0265964621000515" \l "bib49)] before reorientation towards a manned lunar mission. In one way or another, each type of asteroid mining will require the delivery of the targeted resource to a destination via a comparable technology as formerly envisioned by NASA, be it as a raw material or a useable resource processed in situ, even if this is not necessarily done through redirecting the whole asteroid and placing it in a lunar orbit. However, to be misused as a weapon, space mined resources would have to surpass a certain mass threshold to survive atmospheric entry at the target. This seems unfeasible for currently discussed mining concepts using small-scale spacecraft as described in this article. Redirecting larger masses or whole asteroids would require far more powerful mining vessels or small amounts of thrust over long periods of time. The continuous, (for a mining activity) untypical change in the orbit of an asteroid would make a redirect attempt with hostile intent easily identifiable, effectively deterring such an activity in the first place by ensuring the identification of the aggressor long before the projectile hits its target. The proposed database would provide a catalogue of asteroids with exploration and mining activities in place that should be tracked more closely because of their interaction with spacecraft. This would, in fact, be necessary per se as a precaution to avoid catastrophic mishaps, such as the accidental change of a NEO's orbit to intercept Earth by changing its mass through mining.

#### 1AR theory is skewed towards the aff – a) the 2NR must cover substance and over-cover theory, since they get the collapse and persuasive spin advantage of the 3min 2AR, b) their responses to my counter interp will be new, which means 1AR theory necessitates intervention. Implications – a) drop the arg to minimize the chance the round is decided unfairly, b) use reasonability with a bar of defense or the aff always wins since the 2AR can line by line the whole 2NR without winning real abuse. C) if intervention is inevitable on theory then intervene and vote on substance since it’s the only portable impact we get from debate

#### Infinite abuse claims are wrong- A] Spikes solve-you can just preempt paradigms in the 1AC B] Functional limits- 1nc is only 7 minutes long

#### Pics are good they encourage innovative research that avoids stale debates and bridges different parts of the literature. Our PIC directly engages the literature base of the AC

#### Condo is good proving a CP is bad doesn’t prove the plan is good, a logical policy maker can always choose not to act. Logic outweighs – it’s the basis of all rational arguments.

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#### Starlink is key to Precision Ag – key to food sustainability and increasing food supply to account for exponential population growth.

Greensight 21 3-15-2021 "Can Starlink Save the World by Connecting Farms?" <https://www.greensightag.com/logbook/can-starlink-save-the-world-by-connecting-farms/> (Data Management Consulting Firm)//Elmer

GreenSight innovates in a number of different areas, but one of the areas we are most passionate about is in agriculture. We’ve deployed our drone intelligence systems all over the world at all sorts of different facilities. One of the most challenging has been deployments at farms, and one of the biggest challenges has been connectivity. Connected farms are a requirement to feed the world, and Starlink will make that happen. Most urban and suburban households in the United States have had easy and reasonably inexpensive access to high speed internet access for 20 years. It is easy to forget that the situation is not the same for rural areas of the country. Many areas have no access to high speed, “broadband”, internet access, with some having only dialup internet access in their homes. According to the 2015 FCC broadband report, only 53% of rural households have access to high speed internet, even using low standards for “high” speed. On average farms have even less access, and that doesn’t even include high speed connectivity out in their fields. Cellular service is spotty especially on large farms in primarily agricultural areas, and legacy satellite systems provide slow upload speeds at expensive prices. Utilizing modern internet connected technologies and cloud based systems that require constant, high speed access can be a challenge at best and potentially impossible. A 2016 research study by Goldman and Sachs projected that by 2050, the world’s food production efficiency needs to increase by 50% to support our growing population. This paper backs up this conclusion with a lot of research, but the fundamental conclusion is that farming land area is unlikely to increase nor will the number of farmers. Increased global food production increases must come from productivity boosts. Researchers feel that productivity improvements from chemistry and genomics are unlikely to yield significant increases as they have in the past. They predict that the most likely area for these improvements are with precision farming techniques, notably precision planting and precision application of chemicals and water. The term “Precision Agriculture” was coined in the late 1960s and 1970s in seminal research that projected that in the future farming would be driven by data with inputs and practices varied and optimized based on weather, measurements from the field, and accurate year over year yield measurements. Since then, many tools and technologies have been developed that have made true precision agriculture more and more practical. Precision RTK GPS can guide equipment with precision better than an inch. Drones and satellite mapping of fields using remote sensing can map out health and detect problems with the crops. In field IoT sensors will stream live data (such as our partners Soil Scout). Soil genomics and analysis can analyze macro and micro nutrient content of the soil and track the genetics of the soil microbiome (like our friends at Trace Genomics). Robotic and automated farming equipment (like our partners at Monarch Tractor and Husqvarna are building) can vary applications and planting according to precomputed variable rate application maps. Despite all these breakthroughs, precision farming techniques still have a low penetration. There are many reasons for this (more than could be discussed in this article!) but one of them is inadequate connectivity. Most of these modern technologies rely on access to the internet and in many cases it just isn’t possible. For decades subsidies and programs have been rolled out to improve rural connectivity but the reality is that connecting up far flung areas is expensive, often labor intensive, and consequently from a pure business standpoint does not make sense for the connectivity providers. Even as infrastructure expands to more remote areas, there will always remain large swaths of rural america where conventional connectivity infrastructure is highly impractical. Most of GreenSight’s data processing is done in the cloud. Several gigabytes of imagery data are uploaded from our aircraft after every flight to be processed and delivered to our customers. Our custom artificial intelligence analyses the data and informs farmers to problem areas. From many remote farm fields, uploading can be a slow process. We’ve invested heavily in the portability of our systems and our upcoming next generation aircraft will be capable of onboard processing, but despite this connectivity will still be needed to make data available for farmers and other automated agriculture systems. Advanced sensing systems like ours have to be able to integrate with connected robotic sprayers, harvesters and tractors, unlocking the productivity potential of precision agriculture. Humanity needs precision agriculture, and connected data-driven systems will be a big part of that revolution. Beyond the global necessity, the economics for farmers work too! A 2018 USDA studies indicate that connecting US farmland will unlock $50B in industry revenue. We are extremely excited about Starlink and its potential to bring cost effective internet connectivity to farms and rural areas. Starlink levels the playing field for rural areas, enabling high speed connectivity everywhere. No longer will farmers have to wait for high speed wired connectivity to come to their area or install a complex mesh network on their property. IoT data can be streamed from fields as easily as it now streams from urban homes. Starlink will be a catalyzing force for chance, advancing access to precision agriculture globally and contributing to solving global food challenges.

#### Constellations will bridge digital divide – costs fall over time.

**Croshier 22** [Rose Croshier, Rose Croshier is a policy fellow at the Center for Global Development, where her work focuses on enabling low and middle-income countries’ adoption of space-based technology. Before joining CGD, Croshier was an accomplished program and operations manager with the U.S. Air Force, specializing in areas such as Space Operations, Security Cooperation, Peacekeeping, Disaster Management and Military Intelligence. 1-19-2022, "Space and Development: Preparing for Affordable Space-Based Telecommunications," Center For Global Development, [https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications accessed 2/9/22](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications%20accessed%202/9/22)] Adam

* Can be read with other das like precision ag etc
* This can be saved for the 2nr

The starting block for emerging NGSO constellations providing 4G-5G broadband in the commercial space sector has been set thus far by Starlink, costing approximately $500 for a company-subsidized all-inclusive receiver, wifi router and hardware set and about $100 per month, uncapped, broadband subscription.

A combined “first month” cost of $600 is still not realistic for the majority of the undercovered or underconnected population, as illustrated in Figure 6.[[24]](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications#edn24) Using India as an example, even though a Starlink antenna and broadband subscription is steeply cheaper than traditional VSAT options on the market today, it is still seven to eight times more expensive than what is typically available in India’s urban, in-network areas.[[25]](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications#edn25)[[26]](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications#edn26) A MIT study examining 37 countries determined that even though Starlink’s data is unlimited, the flat fee of $100 per month is affordable for only about 15 percent of the undercovered population. Starlink’s greatest potential for early uptake is in rural areas of high-income countries, or undercovered areas of middle-income countries in South America and Southeast Asia.

Over the following decade, however, the same study suggested NGSO satellite prices may drop closer to $30 per Mbps per month, opening up affordability to about 60 percent of the population considered. While these costs are more than what many individual households can afford, civil society organizations, government, and non-governmental organizations can take action to increase sustainability and uptake. Many rural communities, frustrated by the high for-profit cost of rural internet, have successfully established small, cooperative-owned, internet service provider community networks, like the Zenzeleni network in South Africa. These networks have made impressive progress in localizing use and boosting affordability of high-speed broadband.[[27]](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications#edn27)[[28]](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications#edn28)

Most promising, satellite-to-cellphone constellations like Lynk provide a shorter-term jump in both accessibility and affordability. Since they are designed to be incorporated into local mobile network operator’s ecosystem, then the access problem would be addressed, and the cost at level with the local market for cellphones and mobile credit.

Several other innovative approaches, like utilizing television “white space” (TVWS), or “buffer” space between television channels in the radio frequency spectrum to provide cheap broadband internet access, or using drones and balloons to extend middle and last mile coverage, provide additional alternatives for consideration. TVWS may fade as a viable option as countries become more efficient at reducing unused spectrum. Balloons and drones require significant in situ management and maintenance, thus making them less practical for expanding telecommunications infrastructure in developing countries.[[29]](https://www.cgdev.org/publication/space-and-development-preparing-affordable-space-based-telecommunications#edn29)

#### Food Insecurity goes nuclear – escalates multiple hotspots.

Cribb 19 Julian Cribb 8-23-2019 “Food or War” <https://www.cambridge.org/core/books/abs/food-or-war/hotspots-for-food-conflict-in-the-twentyfirst-century/1CD674412E09B8E6F325C9C0A0A6778A> (principal of Julian Cribb & Associates who provide specialist consultancy in the communication of science, agriculture, food, mining, energy and the environment. , His published work includes over 8000 articles, 3000 media releases and eight books. He has received 32 awards for journalism.)//Elmer

Future Food Wars The mounting threat to world peace posed by a food, climate and ecosystem increasingly compromised and unstable was emphasised by the US Director of National Intelligence, Dan Coats, in a briefing to the US Senate in early 2019. 'Global environmental and ecological degradation, as well as climate change, are likely to fuel competition for resources, economic distress, and social discontent through 2019 and beyond', he said. 'Climate hazards such as extreme weather, higher temperatures, droughts, floods, wildfires, storms, sea level rise, soil degradation, and acidifying oceans are intensifying, threatening infrastructure, health, and water and food security. Irreversible damage to ecosystems and habitats will undermine the economic benefits they provide, worsened by air, soil, water, and marine pollution.' Boldly, Coats delivered his warning at a time when the US President, Trump, was attempting to expunge all reference to climate from government documents. 23 Based upon these recent cases of food conflicts, and upon the lessons gleaned from the longer history of the interaction between food and war, several regions of the planet face a greatly heightened risk of conflict towards the mid twentyfirst century. Food wars often start out small, as mere quarrels over grazing rights, access to wells or as one faction trying to control food supplies and markets. However, if not resolved quickly these disputes can quickly escalate into violence, then into civil conflagrations which, if not quelled, can in turn explode into crises that reverberate around the planet in the form of soaring prices, floods of refugees and the involvement of major powers — which in turn carries the risk of transnational war. The danger is magnified by swollen populations, the effects of climate change, depletion of key resources such as water, topsoil and nutrients, the collapse of ecosystem services that support agriculture and fisheries, universal pollution, a widening gap between rich and poor, and the rise of vast megacities unable to feed themselves (Figure 5.3). Each of the world's food 'powderkeg regions' is described below, in ascending order of risk. United States In one sense, food wars have already broken out in the United States, the most overfed country on Earth. Here the issue is chiefly the growing depletion of the nation's mighty ground- water resources, especially in states using it for food production, and the contest over what remains between competing users — farmers, ranchers and Native Americans on the one hand and the oil, gas and mining industry on the other. Concern about the future of US water supplies was aggravated by a series of savage droughts in the early twentyfirst century in the west, south and midwest linked to global climate change and declining snow- pack in the Rocky Mountains, both of which affect not only agriculture but also the rate at which the nation's groundwater reserves recharge. 'Groundwater depletion has been a concern in the Southwest and High Plains for many years, but increased demands on our groundwater resources have overstressed aquifers in many areas of the Nation, not just in arid regions', notes the US Geological Survey.24 Nine US states depend on groundwater for between 50 per cent and 80 per cent of their total freshwater supplies, and five states account for nearly half of the nation's groundwater use. Major US water resources, such as the High Plains aquifers and the Pacific Northwest aquifers have sunk by 30—50 metres (100—150 feet) since exploitation began, imperilling the agricultural industries that rely on them. In the arid south- west, aquifer declines of 100—150 metres have been recorded (Figure 5.4). To take but one case, the famed Ogallala Aquifer in the High Plains region supports cropping industries worth more than US $20 billion a year and was in such a depleted state it would take more than 6000 years to replace by natural infiltration the water drawn from it by farmers in the past 150 years. As it dwindles, some farmers have tried to kick their dependence on ground- water other users, including the growing cities and towns of the region, proceeded to mine it as if there was no tomorrow.25 A study by Kansas State University concluded that so far, 30 per cent of the local groundwater had been extracted and another 39 per cent would be depleted by the mid century on existing trends in withdrawal and recharge.26 Over half the US population relies on groundwater for drinking; both rural and urban America are at risk. Cities such as New Orleans, Houston and Miami face not only rising sea levels — but also sinking land, due to the extraction of underlying ground- water. In Memphis, Tennessee, the aquifer that supplies the city's drinking water has dropped by 20 metres. Growing awareness of the risk of a nation, even one as large and technologically adept as the USA, having insufficient water to grow its food, generate its exports and supply its urban homes has fuelled tensions leading to the eruption of nationwide protests over 'fracking' for oil and gas — a process that can deplete or poison groundwater — and the building -of oil pipe- lines, which have a habit of rupturing and also polluting water resources. The boom in fracking and piping is part of a deliberate US policy to become more self-reliant in fossil fuels.27 Thus, in its anxiety to be independent of overseas energy suppliers, the USA in effect decided to barter away its future food security for current oil security — and the price of this has been a lot of angry farmers, Native Americans and concerned citizens. The depletion of US groundwater coincides with accelerating climate risk, which may raise US temperatures by as much as 4—5 oc by 2100, leading to major losses in soil moisture throughout the US grain belt, and the spread of deserts in the south and west. Food production will also be affected by fiercer storms, bigger floods, more heatwaves, an increase in drought frequency and greater impacts from crop and livestock diseases. In such a context, it is no time to be wasting stored water. The case of the USA is included in the list of world 'hot spots' for future food conflict, not because there is danger of a serious shooting war erupting over water in America in the foreseeable future, but to illustrate that even in technologically advanced countries unforeseen social tensions and crises are on the rise over basic resources like food, land and water and their depletion. This doesn't just happen in Africa or the Middle East. It's a global phenomenon. Furthermore, the USA is the world's largest food exporter and any retreat on its part will have a disproportionate effect on world food price and supply. There is still plenty of time to replan America's food systems and water usage — but, as in the case of fossil fuels and climate, rear-guard action mounted by corporate vested interests and their hired politicians may well paralyse the national will to do it. That is when the US food system could find itself at serious risk, losing access to water in a time of growing climatic disruption, caused by exactly the same forces as those depleting the groundwater: the fossil fuels sector and its political stooges. The probable effect of this will, in the first instance, be a decline in US meat and dairy production accompanied by rising prices and a fall in its feedgrain exports, with domino effects on livestock industries worldwide. The flip-side to this issue is that America's old rival, Russia, is likely to gain in both farmland and water availability as the planet warms through the twentyfirst century — and likewise Canada. Both these countries stand to prosper from a US withdrawal from world food markets, and together they may negate the effects of any US food export shortfalls. Central and South America South America is one of the world's most bountiful continents in terms of food production — but, after decades of improvement, malnutrition is once more on the rise, reaching a new peak of 42.5 million people affected in 2016. 28 'Latin America and the Caribbean used to be a worldwide example in the fight against hunger. We are now following the worrisome global trend', said regional FAO representative Julio Berdegué. 29 Paradoxically, obesity is increasing among Latin American adults, while malnutrition is rising among children. 'Although Latin America and the Caribbean produce enough food to meet the needs of their population, this does not ensure healthy and nutritious diets', the FAO explains. Worsening income inequality, poor access to food and persistent poverty are contributing to the rise in hunger and bad diets, it adds.30 'The impact of climate change in Latin America and the Caribbean will be considerable because of its economic dependence on agriculture, the low adaptive capacity of its population and the geographical location of some of its countries', an FAO report warned.31 Emerging food insecurity in Central and Latin America is being driven by a toxic mixture of failing water supplies, drying farmlands, poverty, maladministration, incompetence and corruption. These issues are exacerbated by climate change, which is making the water supply issue worse for farmers and city people alike in several countries and delivering more weather disasters to agriculture. Mexico has for centuries faced periodic food scarcity, with a tenth of its people today suffering under-nutrition. In 2008 this rose to 18 per cent, leading to outbreaks of political violence. 2 In 2013, 52 million Mexicans were suffering poverty and seven million more faced extreme hunger, despite the attempts of successive governments to remedy the situation. By 2100 northern Mexico is expected to warm by 4—5 oc and southern Mexico by 1.5—2.5 oc. Large parts of the country, including Mexico City, face critical water scarcity. Mexico's cropped area could fall by 40—70 per cent by the 2030s and disappear completely by the end of the century, making it one of the world's countries most at risk from catastrophic climate change and a major potential source of climate refugees.33 The vanishing lakes and glaciers of the high Andes confront montane nations — Bolivia, Peru and Chile especially — with the spectre of growing water scarcity and declining food security. The volume of many glaciers, which provide meltwater to the region's rivers, which in turn irrigate farmland, has halved since 1975.34 Bolivia's second largest water body, the 2000 square kilometres Lake Poopo, dried out completely.35 The loss of water is attributed partly to El Niho droughts, partly to global warming and partly to over-extraction by the mining industries of the region. Chile, with 24,000 glaciers (80 per cent of all those in Latin America) is feeling the effects of their retreat and shrinkage especially, both in large cities such as the capital Santiago, and in irrigation agriculture and energy supply. Chile is rated by the World Resources Institute among the countries most likely to experience extreme water stress by 2040.36 Climate change is producing growing water and food insecurity in the 'dry corridor' of Central America, in countries such as El Salvador, Guatemala and Honduras. Here a combination of drought, major floods and soil erosion is undermining efforts to raise food production and stabilise nutrition. Food production in Venezuela began falling in the 1990s, and by the late 2010s two thirds of the population were malnourished; there was a growing flood of refugees into Colombia and other neighbouring countries. The food crisis has been variously blamed on the Venezuelan government's 'Great Leap Forward' (modelled on that of China — which also caused widespread starvation), a halving in Venezuela's oil export earnings, economic sanctions by the USA, and corruption. However, local scientists such as Nobel Laureate Professor Juan Carlos Sanchez warn that climate impacts are already striking the densely populated coastal regions with increased torrential rains, flooding and mudslides, droughts and hurricanes, while inland areas are drying out and desertifying, leading to crop failures, water scarcity and a tide of climate refugees.37 These factors will tend to deepen food insecurity towards the mid century. Venezuela's climate refugees are already making life more difficult for neighbouring countries such as Colombia. Deforestation in the Brazilian Amazon has, in recent decades, removed around 20 per cent of its total tree cover, replacing it with dry savannah and farmland. At 40 per cent clearance and with continued global warming, scientists anticipate profound changes in the local climate, towards a drying trend, which will hammer the agriculture that has replaced the forest.38 Brazil has already wiped out the once- vast Mata Atlantica forest along its eastern coastline, and this region is now drying, with resultant water stress for both farming and major cities like Säo Paulo. Brazil's outlook for 2100 is for further drying — tied to forest loss as well as global climate change — increased frequency of drought and heatwaves, major fires and acute water scarcity in some regions. Moreover, as the Amazon basin dries out, if will release vast quantities of C02 from its peat swamps and rainforest soils. These are thought to contain in excess of three billion tonnes of carbon and could cause a significant acceleration in global warming, affecting everyone on Earth. 39 Latin America is the world capital of private armies, with as many as 50 major guerrilla groups, paramilitaries, terrorist, indigenous and criminal insurgencies over the past half century exemplified in familiar names like the Sandanistas (Nicaragua), FARC (Colombia) and Shining Path (Peru). 40 Many of these drew their initial inspiration from the international communist movement of the mid twentieth century, while others are right-wing groups set up in opposition to them or else represent land rights movements of disadvantaged groups. However, all these movements rely for oxygen on simmering public discontent with ineffectual or corrupt governments and lack of fair access to food, land and water generally. In other words, the tendency of South and Central America towards internal armed conflict is supercharged significantly by failings in the food system which generate public anger, leading to sympathy and support for anyone seen to be challenging the incumbent regimes. This is not to suggest that feeding every person well would end all insurgencies — but it would certainly take the wind of popular support out of a lot of their sails. In that sense the revolutionary tendency of South America echoes the preconditions for revolution in France and Russia in the eighteenth and twentieth centuries. Central Asia The risk of wars breaking out over water, energy and food insecurity in Central Asia is high.41 Here, the five main players — Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan — face swelling populations, crumbling Soviet-era infrastructure, flagging resource cooperation, a degrading land- scape, deteriorating food availability and a changing climate. At the heart of the issue and the region's increasingly volatile politics is water: 'Without water in the region's two great rivers — the Syr Darya and the Amu Darya — vital crops in the down- stream agricultural powerhouses would die. Without power, life in the upstream countries would be unbearable in the freezing winters' , wrote Rustam Qobil. Central Asia's water crisis first exploded onto the global consciousness with the drying of the Aral Sea — the world's fourth largest lake — from the mid 1960s43, following the damming and draining of major rivers such as the Amu Darya, Syr Darya and Naryn. It was hastened by a major drought in 200844 exacerbated by climate change, which is melting the 'water tower' of glacial ice stored in the Tien Shan, Pamir and Hindu Kush mountain ranges that feed the region's rivers. The Tien Shan alone holds 10,000 glaciers, all of them in retreat, losing an estimated 223 million cubic metres a year. At such a rate of loss the region's rivers will run dry within a generation.45 Lack of water has already delivered a body blow to Central Asia's efforts to modernise its agriculture, adding further tension to regional disputes over food, land and water. 'Water has always been a major cause of wars and border conflicts in the Central Asian region', policy analyst Fuad Shahbazov warned. This potential for conflict over water has been exacerbated by disputes over the Fergana valley, the region's greatest foodbowl, which underwent a 32 per cent surge in population in barely ten years — while more and more of it turned to desert.46 The Central Asian region is ranked by the World Resources Institute as one of the world's most perilously water-stressed regions to 2040 (Figure 5.6). With their economies hitting rock bottom, corrupt and autocratic governments that prefer to blame others for their problems and growing quarrels over food, land, energy and water, the 'Stans' face 'a perfect storm', Nate Shenkkan wrote in the journal Foreign Policy 47 Increased meddling by Russia and China is augmenting the explosive mix: China regards Central Asia as a key component of its 'Belt and Road' initiative intended to expand its global influence, whereas Russia hopes to lure the region back into its own economic sphere. Their rival investments may help limit some of the problems faced by Central Asia — or they may unlock a fresh cycle of political feuding, turmoil and regime change.48 A 2017 FAO report found 14.3 million people — one in every five — in Central Asia did not have enough to eat and a million faced actual starvation, children especially. It noted that after years of steady improvement, the situation was deteriorating. This combination of intractable and deteriorating factors makes Central Asia a serious internal war risk towards the mid twentyfirst century, with involvement by superpowers raising the danger of international conflict and mass refugee flight. The Middle East The Middle East is the most water-stressed region on Earth (see Figure 5.5 above). It is 'particularly vulnerable to climate change. It is one of the world's most water-scarce and dry regions, with a high dependency on climate-sensitive agriculture and a large share of its population and economic activity in flood-prone urban coastal zones', according to the World Bank. 49 The Middle East — consisting of the 22 countries of the Arab League, Turkey and Iran — has very low levels of natural rainfall to begin with. Most of it has 600 millimetres or less per year and is classed as arid. 'The Middle East and North Africa [MENA] is a global hotspot of unsustainable water use, especially of ground- water. In some countries, more than half of current water withdrawals exceed what is naturally available', the Bank said in a separate report on water scarcity. 50 'The climate is predicted to become even hotter and drier in most of the MENA region. Higher temperatures and reduced precipitation will increase the occurrence of droughts. It is further estimated that an additional 80—100 million people will be exposed by 2025 to water stress', the Bank added. The region's population of 300 million in the late 2010s is forecast to double to 600 million by 2050. Average temperatures are expected to rise by 3—5 oc and rainfall will decrease by around 20 per cent. The result will be vastly increased water stress, accelerated desertification, growing food insecurity and a rise in sea levels displacing tens of millions from densely popu- lated, low-lying areas like the Nile delta.51 The region is deemed highly vulnerable to climate impacts, warns a report by the UN Development Programme. 'Current climate change projections show that by the year 2025, the water supply in the Arab region will be only 15 per cent of levels in 1960. With population growth around 3 per cent annually and deforestation spiking to 4 per cent annually... the region now includes 14 of the world s 20 most water-stressed countries.'52 The Middle Fast/North Africa (MENA) region has 6 per cent of the world's population with only 1.5 per cent of the world's fresh water reserves to share among them. This means that the average citizen already has about a third less water than the minimum necessary for a reasonable existence — many have less than half, and populations are growing rapidly. Coupled with political chaos and ill governance in many countries, growing religious and ethnic tensions between different groups — often based on centuries-old disputes — a widening gap between rich and poor and foreign meddling by the USA, Russia and China, shortages of food, land and water make the Middle East an evident cauldron for conflict in the twentyfirst century. Growing awareness of their food risk has impelled some oil-rich Arab states into an international farm buying spree, purchasing farming, fishing and food processing companies in countries as assorted as South Sudan, Ethiopia, the Philippines, Ukraine, the USA, Poland, Argentina, Australia, Brazil and Morocco. In some food-stressed countries these acquisitions have already led to riots and killings.53 The risk is high that, by exporting its own food—land—water problems worldwide, especially to regions already facing scarcity, the Middle East could propagate conflicts and government collapses around the globe. This is despite the fact that high-tech solar desalination, green energy, hydroponics, aquaponics and other intensive urban food production technologies make it possible for the region to produce far more of its own food locally, if not to be entirely self-sufficient. Dimensions of the growing crisis in the Middle East include the following. Wars have already broken out in Syria and Yemen in which scarcity of food, land and water were prominent among the tensions that led to conflict between competing groups. Food, land and water issues feed into and exacerbate already volatile sentiment over religion, politics, corruption, mismanagement and foreign interference by the USA, China and Russia. The introduction of cheap solar-powered and diesel pumps has accelerated the unsustainable extraction of groundwater throughout the region, notably in countries like Libya, Egypt, Saudi Arabia and Morocco. 54 Turkish building of new dams to monopolise waters flowing across its borders is igniting scarcity and potential for conflict with downstream nations, including Iraq, Iran and Syria. 55 Egypt's lifeline, the Nile, is threatened by Ethiopian plans to dam the Blue Nile, with tensions that some observers consider could lead to a shooting war. 56 There are very low levels of water recycling throughout the region, while water use productivity is about half that of the world as a whole. There is a lack of a sense of citizen responsibility for water and food scarcity throughout the region. Land grabs around the world by oil-rich states are threatening to destabilise food, land and water in other countries and regions, causing conflict. A decline in oil prices and the displacement of oil by the global renewables revolution may leave the region with fewer economic options for solving its problems. There is a risk that acquisition of a nuclear weapon by Iran may set off a nuclear arms race in the region with countries such as Saudi Arabia, Syria and possibly Turkey following suit and Israel rearming to stay in the lead. This would translate potential food, land and water conflicts into the atomic realm. Together these issues, and failure to address their root causes, make the Middle East a fizzing powder keg in the twentyfirst century. The question is when and where, not whether, it explodes — and whether the resulting conflict will involve the use of weapons of mass destruction, including nuclear, thus affecting the entire world. China China is the world's biggest producer, importer and consumer of food. Much of the landmass of the People's Republic of China (PRC) is too mountainous or too arid for farming, but the rich soils of its eastern and southern regions are highly productive provided sufficient water is available and climate impacts are mild. Those, however, are very big 'ifs'. In 1995, American environmentalist Lester R. Brown both Eked and aroused the PRC Communist Party bosses with a small, hard-hitting book entitled Who Will Feed China? Wake-Up Call for a Small Planet.57 In it he posited that Chinese population growth was so far out of control that the then-agricultural system could not keep up, and China would be forced to import vast amounts of grain, to the detriment of food prices and availability worldwide. His fears, so far, have not been realised — not because they were unsoundly based, but because China managed — just — to stay abreast of rising food demand by stabilising and subsidising grain prices, restoring degraded lands, boosting agricultural science and technology, piping water from south to north, developing high-intensity urban farms, buying up foreign farmland worldwide and encouraging young Chinese to leave the country. What Brown didn't anticipate was the economic miracle that made China rich enough to afford all this. However, his essential thesis remains valid: China's food supply will remain on a knife-edge for the entire twentyfirst century, vulnerable especially to water scarcity and climate impacts. If the nation outruns its domestic resources yet still has to eat, it may well be at the expense of others globally. Some western commentators were puzzled when China scrapped its 35-year 'One Child Policy' in 2015, but in fact the policy had done its job, shaving around 300 million people off the projected peak of Chinese population. It was also causing serious imbalances, such as China's huge unmarried male sur- plus. Furthermore, rising urbanisation and household incomes meant Chinese parents no longer wanted large families, as in the past. Policy or no policy, China's birthrate has continued to fall and by 2018 was 1.6 babies per woman — well below replacement, lower than the USA and nearly as low as Germany. Its population was 1.4 billion, but this was growing at barely 0.4 per cent a year, with the growth due at least in part to lengthening life expectancy. 58 For China, female fertility is no longer the key issue. The critical issue is water. And the critical region is the north, where 41 per cent of the population reside. Here surface and ground- waters — which support not only the vast grain and vegetable farming industries of the North China Plain but also burgeoning megacities like Beijing, Tianjin and Shenyang — have been vanishing at an alarming rate. 'In the past 25 years, 28,000 rivers have disappeared. Groundwater has fallen by up to 1—3 metres a year. One consequence: parts of Beijing are subsiding by 11 cm a year. The flow of the Yellow River, water supply to millions, is a tenth of what it was in the 1940s; it often fails to reach the sea. Pollution further curtails supply: in 2017 8.8 per cent of water was unfit even for agricultural or industrial use', the Financial Times reported.59 On the North China Plain, annual consump- tion of water for all uses, including food production, is about 27 billion cubic metres a year — compared with an annual water availability of 22 billion cubic metres, a deficit that is made up by the short-term expedient of mining the region's groundwater. 60 To stave off disaster, the PRC has built a prodigious network of canals and pipelines from the Yangtse River in the water-rich south, to Beijing in the water-starved north. Hailed as a 'lifeline', the South—North Water Transfer Project had two drawbacks: first, the fossil energy required to pump millions of tonnes of water over a thousand kilometres and, second, the fact that while the volume was sufficient to satisfy the burgeoning cities for a time, it could not supply and distribute enough clean water to meet the needs of irrigated farming over so vast a region in the long run, nor meet those of its planned industrial growth.61 Oft-mouthed 'solutions' like desalination or the piping of water from Tibet or Russia face similar drawbacks: demand is too great for the potential supply and the costs, both financial and environmental, prohibitive. China is already among the world's most water-stressed nations. The typical Chinese citizen has a 'water footprint' of 1071 cubic metres a year — three quarters of the world average (1385 cubic metres), and scarcely a third that of the average American (2842 cubic metres).62 Of this water, 62 per cent is used to grow food to feed the Chinese population — and 90 per cent is so polluted it is unfit to drink or use in food processing. Despite massive investment in water infrastructure and new technology, many experts doubt that China can keep pace with the growth in its demand for food, at least within its own borders, chiefly because of water scarcity.63 Adding to the pressure is that China's national five-year plans for industrialisation demand massive amounts more water — demands that may confront China with a stark choice between food and economic growth. 'The Chinese government is moving too slowly towards the Camel Economy. It has plans, incentives for officials; it invests in recycling, irrigation, pollution, drought resistant crops; it leads the world in high voltage transmission (to get hydro, wind and solar energy from the west of China). None of this is sufficient or likely to be in time', the Financial Times opined. As the world's leading carbon emitter, China is more responsible for climate change than any other country. It is also, potentially, more at risk. The main reason, quite simply, is the impact of a warming world on China's water supply — in the form of disappearing rivers, lakes, groundwater and mountain glaciers along with rising sea levels. To this is coupled the threat to agriculture from increasing weather disasters and the loss of ecosystem services from a damaged landscape. 65 China is thus impaled on the horns of a classic dilemma. Without more water it cannot grow its economy sufficiently to pay for the water-conserving and food-producing technologies and infrastructure it needs to feed its people. Having inadvertently unleashed a population explosion with its highly successful conversion to modern farming systems, the challenge for China now is to somehow sustain its food supply through the population peak of the mid twentyfirst century, followed by a managed decline to maybe half of today's numbers by the early twentysecond century. It is far from clear whether the present approach — improving market efficiency, continuing to modernise agricultural production systems, pumping water, trying to control soil and water losses and importing more food from overseas will work. 66 China has pinned its main hopes on technology to boost farm yields and improve water distribution and management. Unfortunately, it has selected the unsustainable American industrial farming model to do this — which involves the massive use of water, toxic chemicals, fertilisers, fossil fuels and machines. This in turn is having dreadful consequences for China's soils, waters, landscapes, food supply, air, climate and consumer health. Serious questions are now being asked whether such an approach is not digging the hole China is in, even deeper. Furthermore, some western analysts are sceptical whether the heavy hand of state control is up to the task of generating the levels of innovation required to feed China sustainably.67 Plan B, which is to purchase food from other countries, or import it from Chinese-owned farming and food ventures around the world, faces similar difficulties. Many of the countries where China is investing in food production themselves face a slow-burning crisis of land degradation, water scarcity, surging populations and swelling local food demand. By exporting its own problems, China is adding to their difficulties. While there may be some truth to the claim that China is helping to modernise food systems in Africa, for example, it is equally clear that the export of food at a time of local shortages could have dire consequences for Africans, leading to wars in Africa and elsewhere. How countries will react to Chinese pressure to export food in the face of their own domestic shortages is, as yet, unclear. If they permit exports, it could prove cata- strophic for their own people and governments — but if they cut them off, it could be equally catastrophic for China. Such a situation cannot be regarded as anything other than a menace to world peace. Around 1640, a series of intense droughts caused widespread crop failures in China, leading to unrest and uprisings which, in 1644, brought down the Ming Dynasty. A serious domestic Chinese food and water crisis today — driven by drought, degradation of land and water and climate change in northern China coupled with failure in food imports — could cause a re-run of history: 'The forthcoming water crisis may impact China's social, economic, and political stability to a great extent', a US Intelligence Assessment found. The adverse impacts of climate change will add extra pressure to existing social and resource stresses.' 68 Such events have the potential to precipitate tens, even hundreds, of millions of emigrants and refugees into countries all over the world, with domino consequences for those countries that receive them. Strategic analysts have speculated that tens of millions of desperate Chinese flooding into eastern Russia, or even India, could lead to war, including the risk of international nuclear exchange. 69 Against such a scenario are the plain facts that China is a technologically advanced society, with the foresight, wealth and capacity to plan and implement nationwide changes and the will, if necessary, to enforce them. Its leaders are clearly alert to the food and water challenge — and its resolution may well depend on the extent of water recycling they are able to achieve. As to whether the PRC can afford the cost of transitioning from an unsustainable to a sustainable food system, all countries have a choice between unproductive military spending and feeding their populace. A choice between food or war. It remains to be seen which investment China favours. However, it is vital to understand that the problem of whether China can feed itself through the twentyfirst century is not purely a Chinese problem. It's a problem, both economic and physical, for the entire planet — and it is thus in everyone's best interest to help solve it. For this reason, China is rated number 3 on this list of potential food war hotspots. Africa Food wars — that is, wars in which food, land and water play a significant contributing role — have been a constant in the story of Africa since the mid twentieth century, indeed, far longer. In a sense, the continent is already a microcosm of the world of the twentyfirst century as climate change and resource scarcity com- bine with rapid population growth to ratchet up the tensions that lead competing groups to fight, whether the superficial distinc- Mons between them are ethnic, religious, social or political. We have examined the particular cases of Rwanda, South Sudan and the Horn of Africa — but there are numerous other African conflicts, insurgencies and ongoing disturbances in which food, land and water are primary or secondary triggers and where famine is often the outcome: Nigeria, Congo, Egypt, Tunisia, Libya, Mali, Chad, the Central African Republic, the Maghreb region of the Sahara, Mozambique, Cote d'Ivoire and Zimbabwe have all experienced conflicts in which issues of access to food, land and water were important drivers and consequences. The trajectory of Africa's population in the first two decades of the twentyfirst century implies that the number of its people could quadruple from 1.2 billion in 2017 to 4.5 billion by 2100 (Figure 5.6). If fulfilled, this would make Africans 41 per cent of the world population by the end of the century. The UN Popula- tion Division's nearer projections are for Africans to outnumber Chinese or Indians at 1.7 billion by 2030, and reach 2.5 billion in 2050, which represents a doubling in the continent's inhabitants in barely 30 years. 70 While African fertility rates (babies per woman) remain high by world standards — 4.5 compared with a global average of 2.4 — they have also fallen steeply, from a peak of 8.5 babies in the 1970s. Furthermore, the picture is uneven with birthrates in most Sub-Saharan countries remaining high (around five to six babies/woman), while those of eight, mainly southern, countries have dropped to replace- ment or below (i.e. under 2.1). As has been the case around the world, birth rates tend to drop rapidly with the spread of urban isation, education and economic growth — whereas countries which slide back into poverty tend to experience rising birth- rates. Food access is a vital ingredient in this dynamic: it has been widely observed that better-fed countries tend to have much lower rates of birth and population growth, possibly because people who are food secure lose fewer infants and children in early life and thus are more open to family planning. So, in a real sense, food sufficiency holds one of the keys to limiting the human population to a level sustainable both for Africa and the planet in general. Forecasting the future of Africa is not easy, given the complexity of the interwoven climatic, social, technological and political issues — and many do not attempt it. However, the relentless optimism of the UN and its food agency, the FAO, is probably not justified by the facts as they are known to science — and may have more to do with not wishing to give offence to African governments or discourage donors than with attempting to accurately analyse what may occur. Even the FAO acknowledges however that food insecurity is rising across Sub-Saharan Africa as well as other parts. In 2017, conflict and insecurity were the major drivers of acute food insecurity in 18 countries and territories where almost 74 million food-insecure people were in need of urgent assistance. Eleven of these countries were in Africa and accounted for 37 million acutely food insecure people; the largest numbers were in northern Nigeria, Demo- cratic Republic of Congo, Somalia and South Sudan the agency said in its Global Report on Food Crises 2018.71 The FAO also noted that almost one in four Africans was undernourished in 2016 — a total of nearly a quarter of a billion people. The rise in undernourishment and food insecurity was linked to the effects of climate change, natural disasters and conflict according to Bukar Tijani, the FAO's assistant director general for Africa. 72 Even the comparatively prosperous nation of South Africa sits on a conflict knife-edge, according to a scientific study: 'Results indicate that the country exceeds its environmental boundaries for biodiversity loss, marine harvesting, freshwater use, and climate change, and that social deprivation was most severe in the areas of safety, income, and employment, which are significant factors in conflict risk', Megan Cole and colleagues found. 73 In the Congo, home to the world's second largest tropical forest, 20 years of civil war had not only slain five million civilians but also decimated the forests and their ecological services on which the nation depended. Researchers found evidence that reducing conflict can also help to reduce environ- mental destruction: 'Peace-building can potentially be a win for nature as well, and.. conservation organizations and govern- ments should be ready to seize conservation opportunities'. 74 As the African population doubles toward the mid century, as its water, soils, forests and economic wealth per capita dwindle, as foreign corporations plunder its riches, as a turbulent climate hammers its herders and farmers — both industrial and traditional — the prospect of Africa resolving existing conflicts and avoiding new ones is receding. The mistake most of the world is making is to imagine this only affects the Africans. The consequences will impact everyone on the planet. A World Bank study has warned that 140 million people will have to leave just three regions of the world as climate refugees before 2050 — and the vast majority of these, some 86 million, would be displaced from their homes in Sub-Saharan Africa. 75 The second decade of the

### 1NC---OFF

#### Ethics begin a posteriori.

#### 1] Knowledge is based on experience – I wouldn’t know 2+2=4 without experience of objects nor the color red without some experience of color. We can’t obtain evidence of goodness without experience.

#### 2] Indifference – Even if there are apriori moral truths, I can choose to ignore them. Cognition is binding – if I put my hand on a hot stove, I can’t turn off my natural aversion to it.

#### The standard is act hedonistic util. Prefer –

#### 1] Pleasure and pain *are* intrinsic value and disvalue – everything else *regresses* – robust neuroscience.

Blum et al. 18

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**Pleasure** is not only one of the three primary reward functions but it also **defines reward.** As homeostasis explains the functions of only a limited number of rewards, the principal reason why particular stimuli, objects, events, situations, and activities are rewarding may be due to pleasure. This applies first of all to sex and to the primary homeostatic rewards of food and liquid and extends to money, taste, beauty, social encounters and nonmaterial, internally set, and intrinsic rewards. Pleasure, as the primary effect of rewards, drives the prime reward functions of learning, approach behavior, and decision making and provides the **basis for hedonic theories** of reward function. We are attracted by most rewards and exert intense efforts to obtain them, just because they are enjoyable [10].

Pleasure is a passive reaction that derives from the experience or prediction of reward and may lead to a long-lasting state of happiness. The word happiness is difficult to define. In fact, just obtaining physical pleasure may not be enough. One key to happiness involves a network of good friends. However, it is not obvious how the higher forms of satisfaction and pleasure are related to an ice cream cone, or to your team winning a sporting event. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure [14].

Pleasure as a hallmark of reward is sufficient for defining a reward, but it may not be necessary. A reward may generate positive learning and approach behavior simply because it contains substances that are essential for body function. When we are hungry, we may eat bad and unpleasant meals. A monkey who receives hundreds of small drops of water every morning in the laboratory is unlikely to feel a rush of pleasure every time it gets the 0.1 ml. Nevertheless, with these precautions in mind, we may define any stimulus, object, event, activity, or situation that has the potential to produce pleasure as a reward. In the context of reward deficiency or for disorders of addiction, homeostasis pursues pharmacological treatments: drugs to treat drug addiction, obesity, and other compulsive behaviors. The theory of allostasis suggests broader approaches - such as re-expanding the range of possible pleasures and providing opportunities to expend effort in their pursuit. [15]. It is noteworthy, the first animal studies eliciting approach behavior by electrical brain stimulation interpreted their findings as a discovery of the brain’s pleasure centers [16] which were later partly associated with midbrain dopamine neurons [17–19] despite the notorious difficulties of identifying emotions in animals.

Evolutionary theories of pleasure: The love connection BO:D

Charles Darwin and other biological scientists that have examined the biological evolution and its basic principles found various mechanisms that steer behavior and biological development. Besides their theory on natural selection, it was particularly the sexual selection process that gained significance in the latter context over the last century, especially when it comes to the question of what makes us “what we are,” i.e., human. However, the capacity to sexually select and evolve is not at all a human accomplishment alone or a sign of our uniqueness; yet, we humans, as it seems, are ingenious in fooling ourselves and others–when we are in love or desperately search for it.

It is well established that modern biological theory conjectures that **organisms are** the **result of evolutionary competition.** In fact, Richard Dawkins stresses gene survival and propagation as the basic mechanism of life [20]. Only genes that lead to the fittest phenotype will make it. It is noteworthy that the phenotype is selected based on behavior that maximizes gene propagation. To do so, the phenotype must survive and generate offspring, and be better at it than its competitors. Thus, the ultimate, distal function of rewards is to increase evolutionary fitness by ensuring the survival of the organism and reproduction. It is agreed that learning, approach, economic decisions, and positive emotions are the proximal functions through which phenotypes obtain other necessary nutrients for survival, mating, and care for offspring.

Behavioral reward functions have evolved to help individuals to survive and propagate their genes. Apparently, people need to live well and long enough to reproduce. Most would agree that homo-sapiens do so by ingesting the substances that make their bodies function properly. For this reason, foods and drinks are rewards. Additional rewards, including those used for economic exchanges, ensure sufficient palatable food and drink supply. Mating and gene propagation is supported by powerful sexual attraction. Additional properties, like body form, augment the chance to mate and nourish and defend offspring and are therefore also rewards. Care for offspring until they can reproduce themselves helps gene propagation and is rewarding; otherwise, many believe mating is useless. According to David E Comings, as any small edge will ultimately result in evolutionary advantage [21], additional reward mechanisms like novelty seeking and exploration widen the spectrum of available rewards and thus enhance the chance for survival, reproduction, and ultimate gene propagation. These functions may help us to obtain the benefits of distant rewards that are determined by our own interests and not immediately available in the environment. Thus the distal reward function in gene propagation and evolutionary fitness defines the proximal reward functions that we see in everyday behavior. That is why foods, drinks, mates, and offspring are rewarding.

There have been theories linking pleasure as a required component of health benefits salutogenesis, (salugenesis). In essence, under these terms, pleasure is described as a state or feeling of happiness and satisfaction resulting from an experience that one enjoys. Regarding pleasure, it is a double-edged sword, on the one hand, it promotes positive feelings (like mindfulness) and even better cognition, possibly through the release of dopamine [22]. But on the other hand, pleasure simultaneously encourages addiction and other negative behaviors, i.e., motivational toxicity. It is a complex neurobiological phenomenon, relying on reward circuitry or limbic activity. It is important to realize that through the “Brain Reward Cascade” (BRC) endorphin and endogenous morphinergic mechanisms may play a role [23]. While natural rewards are essential for survival and appetitive motivation leading to beneficial biological behaviors like eating, sex, and reproduction, crucial social interactions seem to further facilitate the positive effects exerted by pleasurable experiences. Indeed, experimentation with addictive drugs is capable of directly acting on reward pathways and causing deterioration of these systems promoting hypodopaminergia [24]. Most would agree that pleasurable activities can stimulate personal growth and may help to induce healthy behavioral changes, including stress management [25]. The work of Esch and Stefano [26] concerning the link between compassion and love implicate the brain reward system, and pleasure induction suggests that social contact in general, i.e., love, attachment, and compassion, can be highly effective in stress reduction, survival, and overall health.

Understanding the role of neurotransmission and pleasurable states both positive and negative have been adequately studied over many decades [26–37], but comparative anatomical and neurobiological function between animals and homo sapiens appear to be required and seem to be in an infancy stage.

Finding happiness is different between apes and humans

As stated earlier in this expert opinion one key to happiness involves a network of good friends [38]. However, it is not entirely clear exactly how the higher forms of satisfaction and pleasure are related to a sugar rush, winning a sports event or even sky diving, all of which augment dopamine release at the reward brain site. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure.

Remarkably, there are pathways for ordinary liking and pleasure, which are limited in scope as described above in this commentary. However, there are **many brain regions**, often termed hot and cold spots, that significantly **modulate** (increase or decrease) our **pleasure or** even produce **the opposite** of pleasure— that is disgust and fear [39]. One specific region of the nucleus accumbens is organized like a computer keyboard, with particular stimulus triggers in rows— producing an increase and decrease of pleasure and disgust. Moreover, the cortex has unique roles in the cognitive evaluation of our feelings of pleasure [40]. Importantly, the interplay of these multiple triggers and the higher brain centers in the prefrontal cortex are very intricate and are just being uncovered.

Desire and reward centers

It is surprising that many different sources of pleasure activate the same circuits between the mesocorticolimbic regions (Figure 1). Reward and desire are two aspects pleasure induction and have a very widespread, large circuit. Some part of this circuit distinguishes between desire and dread. The so-called pleasure circuitry called “REWARD” involves a well-known dopamine pathway in the mesolimbic system that can influence both pleasure and motivation.

In simplest terms, the well-established mesolimbic system is a dopamine circuit for reward. It starts in the ventral tegmental area (VTA) of the midbrain and travels to the nucleus accumbens (Figure 2). It is the cornerstone target to all addictions. The VTA is encompassed with neurons using glutamate, GABA, and dopamine. The nucleus accumbens (NAc) is located within the ventral striatum and is divided into two sub-regions—the motor and limbic regions associated with its core and shell, respectively. The NAc has spiny neurons that receive dopamine from the VTA and glutamate (a dopamine driver) from the hippocampus, amygdala and medial prefrontal cortex. Subsequently, the NAc projects GABA signals to an area termed the ventral pallidum (VP). The region is a relay station in the limbic loop of the basal ganglia, critical for motivation, behavior, emotions and the “Feel Good” response. This defined system of the brain is involved in all addictions –substance, and non –substance related. In 1995, our laboratory coined the term “Reward Deficiency Syndrome” (RDS) to describe genetic and epigenetic induced hypodopaminergia in the “Brain Reward Cascade” that contribute to addiction and compulsive behaviors [3,6,41].

Furthermore, ordinary “liking” of something, or pure pleasure, is represented by small regions mainly in the limbic system (old reptilian part of the brain). These may be part of larger neural circuits. In Latin, hedus is the term for “sweet”; and in Greek, hodone is the term for “pleasure.” Thus, the word Hedonic is now referring to various subcomponents of pleasure: some associated with purely sensory and others with more complex emotions involving morals, aesthetics, and social interactions. The capacity to have pleasure is part of being healthy and may even extend life, especially if linked to optimism as a dopaminergic response [42].

Psychiatric illness often includes symptoms of an abnormal inability to experience pleasure, referred to as anhedonia. A negative feeling state is called dysphoria, which can consist of many emotions such as pain, depression, anxiety, fear, and disgust. Previously many scientists used animal research to uncover the complex mechanisms of pleasure, liking, motivation and even emotions like panic and fear, as discussed above [43]. However, as a significant amount of related research about the specific brain regions of pleasure/reward circuitry has been derived from invasive studies of animals, these cannot be directly compared with subjective states experienced by humans.

In an attempt to resolve the controversy regarding the causal contributions of mesolimbic dopamine systems to reward, we have previously evaluated the three-main competing explanatory categories: “liking,” “learning,” and “wanting” [3]. That is, dopamine may mediate (a) liking: the hedonic impact of reward, (b) learning: learned predictions about rewarding effects, or (c) wanting: the pursuit of rewards by attributing incentive salience to reward-related stimuli [44]. We have evaluated these hypotheses, especially as they relate to the RDS, and we find that the incentive salience or “wanting” hypothesis of dopaminergic functioning is supported by a majority of the scientific evidence. Various neuroimaging studies have shown that anticipated behaviors such as sex and gaming, delicious foods and drugs of abuse all affect brain regions associated with reward networks, and may not be unidirectional. Drugs of abuse enhance dopamine signaling which sensitizes mesolimbic brain mechanisms that apparently evolved explicitly to attribute incentive salience to various rewards [45].

Addictive substances are voluntarily self-administered, and they enhance (directly or indirectly) dopaminergic synaptic function in the NAc. This activation of the brain reward networks (producing the ecstatic “high” that users seek). Although these circuits were initially thought to encode a set point of hedonic tone, it is now being considered to be far more complicated in function, also encoding attention, reward expectancy, disconfirmation of reward expectancy, and incentive motivation [46]. The argument about addiction as a disease may be confused with a predisposition to substance and nonsubstance rewards relative to the extreme effect of drugs of abuse on brain neurochemistry. The former sets up an individual to be at high risk through both genetic polymorphisms in reward genes as well as harmful epigenetic insult. Some Psychologists, even with all the data, still infer that addiction is not a disease [47]. Elevated stress levels, together with polymorphisms (genetic variations) of various dopaminergic genes and the genes related to other neurotransmitters (and their genetic variants), and may have an additive effect on vulnerability to various addictions [48]. In this regard, Vanyukov, et al. [48] suggested based on review that whereas the gateway hypothesis does not specify mechanistic connections between “stages,” and does not extend to the risks for addictions the concept of common liability to addictions may be more parsimonious. The latter theory is grounded in genetic theory and supported by data identifying common sources of variation in the risk for specific addictions (e.g., RDS). This commonality has identifiable neurobiological substrate and plausible evolutionary explanations.

Over many years the controversy of dopamine involvement in especially “pleasure” has led to confusion concerning separating motivation from actual pleasure (wanting versus liking) [49]. We take the position that animal studies cannot provide real clinical information as described by self-reports in humans. As mentioned earlier and in the abstract, on November 23rd, 2017, evidence for our concerns was discovered [50]

In essence, although nonhuman primate brains are similar to our own, the disparity between other primates and those of human cognitive abilities tells us that surface similarity is not the whole story. Sousa et al. [50] small case found various differentially expressed genes, to associate with pleasure related systems. Furthermore, the dopaminergic interneurons located in the human neocortex were absent from the neocortex of nonhuman African apes. Such differences in neuronal transcriptional programs may underlie a variety of neurodevelopmental disorders.

In simpler terms, the system controls the production of dopamine, a chemical messenger that plays a significant role in pleasure and rewards. The senior author, Dr. Nenad Sestan from Yale, stated: “Humans have evolved a dopamine system that is different than the one in chimpanzees.” This may explain why the behavior of humans is so unique from that of non-human primates, even though our brains are so surprisingly similar, Sestan said: “It might also shed light on why people are vulnerable to mental disorders such as autism (possibly even addiction).” Remarkably, this research finding emerged from an extensive, multicenter collaboration to compare the brains across several species. These researchers examined 247 specimens of neural tissue from six humans, five chimpanzees, and five macaque monkeys. Moreover, these investigators analyzed which genes were turned on or off in 16 regions of the brain. While the differences among species were subtle, **there was** a **remarkable contrast in** the **neocortices**, specifically in an area of the brain that is much more developed in humans than in chimpanzees. In fact, these researchers found that a gene called tyrosine hydroxylase (TH) for the enzyme, responsible for the production of dopamine, was expressed in the neocortex of humans, but not chimpanzees. As discussed earlier, dopamine is best known for its essential role within the brain’s reward system; the very system that responds to everything from sex, to gambling, to food, and to addictive drugs. However, dopamine also assists in regulating emotional responses, memory, and movement. Notably, abnormal dopamine levels have been linked to disorders including Parkinson’s, schizophrenia and spectrum disorders such as autism and addiction or RDS.

Nora Volkow, the director of NIDA, pointed out that one alluring possibility is that the neurotransmitter dopamine plays a substantial role in humans’ ability to pursue various rewards that are perhaps months or even years away in the future. This same idea has been suggested by Dr. Robert Sapolsky, a professor of biology and neurology at Stanford University. Dr. Sapolsky cited evidence that dopamine levels rise dramatically in humans when we anticipate potential rewards that are uncertain and even far off in our futures, such as retirement or even the possible alterlife. This may explain what often motivates people to work for things that have no apparent short-term benefit [51]. In similar work, Volkow and Bale [52] proposed a model in which dopamine can favor NOW processes through phasic signaling in reward circuits or LATER processes through tonic signaling in control circuits. Specifically, they suggest that through its modulation of the orbitofrontal cortex, which processes salience attribution, dopamine also enables shilting from NOW to LATER, while its modulation of the insula, which processes interoceptive information, influences the probability of selecting NOW versus LATER actions based on an individual’s physiological state. This hypothesis further supports the concept that disruptions along these circuits contribute to diverse pathologies, including obesity and addiction or RDS.

#### 2] No intent-foresight distinction – if I foresee a consequence, then it becomes part of my deliberation since its intrinsic to my action

#### 3] Actor spec – governments lack wills or intentions and inevitably deals with tradeoffs – outweighs because agents have differing obligations.

#### 4] No act omission distinction – choosing not to act is an action in of itself since you had to make an active decision to omit. Walking past a drowning baby and choosing not to save it is a cognitive decision you were faced with and you actively decided to keep walking b) warranting a distinction gives agents the permissible choice of omitting from any ethical action since omissions lack culpability.

#### 5] death is bad and outweighs – a) agents can’t act if they fear for their bodily security which constrains every ethical theory, b) it destroys the subject itself – kills any ability to achieve value in ethics since life is a prerequisite which means it’s a side constraint since we can’t reach the end goal of ethics without life

#### 6] No calc indicts – a) no philosophy actually says that consequences don’t matter at all since otherwise it would indict every theory since they use causal events to understand how their ethics have worked in the past and through the justification of premises b) we don’t need consequences – winning hedonism proves we’re the only one with impacts to it which means risk of offense framing is sufficient c) they’re blippy nibs that set the aff at an unfair advantage since they only have to win one while we have to beat them all – voting issue for fairness

#### 7] Extinction first –

#### 1 – Forecloses future improvement – we can never improve society because our impact is irreversible which proves moral uncertainty

#### 2 – Turns suffering – mass death causes suffering because people can’t get access to resources and basic necessities

#### 3 – Objectivity – body count is the most objective way to calculate impacts because comparing suffering is unethical

## Case

### 1NC---AT: FW

#### 1. Shmagency—people can always just choose not to be an agent and shift out of their obligations which means their theory can never hold anyone culpable and permits atrocities

#### 2. Tailoring—you can always tailor a rule to be more and more particular to the point where any action is ok because of how specific the rule is

At practical reason

#### 1. No impact doesn’t disprove the normative goodness of it - people can always say no to being an agent but only util solves since you cant stop your biological imperatives

#### Fallacy of Origin – we can say morality is deduced from practical reason without holding that reason is in itself valuable.

reason's inescapability is not the key internal link — they need to win that our rational agency commits us to willing universal maxims — yes, agents act on reasons but what we view as reason for action is dictated by which action maximizes pleasure

Util solves uncertainty since we are all certain by our biological feelings plus governments solve since they know to prevent death b] Abduction disproves— we can reason to the best inference that external objects are the cause of my sense perception since it's existence of external objects is presupposed by other theories that we can verify, and those theories transfer warrant to the presupposition

No is ought gap a] winning bindingness means it’s the only thing we can have as a fw b] kant can’t solve since you can’t prescribe ough claims to people

Unconditional worth is a reason as to why extinction outweighs and this is circular -

#### Constitutivism fails—showing we inevitably do engage in agency is insufficient to prove we ought to

Enoch 11 [(David, Philosophy Professor at Hebrew University) “Shmagency Revisited,” New Waves in Metaethics pp 208-233, 2011, https://link.springer.com/chapter/10.1057/9780230294899\_11] TDI

3.2 Irrelevance

So much, then, for the implausibility of the but-you-do-care response to the whyshould-I-care-about-(e.g.)-self-understanding challenge. What I want to argue now is that even if we ignore this implausibility, still this response cannot possibly work, because it does not even qualify as a response – it fails to address the challenge. The thought here is very simple: Noting that I do Φ is never a good answer to the question whether I should Φ. This is true for actions, and it is just as true for carings. Perhaps I do care about something; but how does noticing this fact count as an answer to the normative question whether I should care about it, or indeed as a reason for caring about it?

The point is not merely an is-ought-gap kind of point. True, some of us have somehow become very good at convincing ourselves that sometimes, an ought can after all be derived from an is, or that some normative facts or properties just are some natural facts or properties, or some such. But what we are up against here is an especially problematic instance of such a move – it is the move from someone caring about something, immediately to it being the case that she should care about it, or at least that she has a reason to so care. I take it even those of us with the strongest stomach for naturalistic fallacies should not be happy with such a move. When someone asks "Why should I care about self-understanding?" (or whatever else is constitutive of agency), and the response comes "But you do care!", all that is needed by way of counter-response is "So what? I asked whether I should care, not whether I 14 do. You haven't answered my question." The but-you-do-care response is thus no response at all. It is utterly irrelevant.

Constitutivists like to emphasize that the agency game is not just one we do play, but also one we cannot avoid playing, agency is – in certain senses – inescapable for creatures like us. Constitutivists then sometimes suggest that the inescapability of agency somehow helps with the shmagency challenge (and related challenges) 17.

Thus, Velleman (136-7) distinguishes two senses of inescapability, suggesting that their combined strength helps in answering the why-should-I-care-about-self-understanding challenge. His two senses may be labeled natural and dialectical18. Let me postpone discussion of dialectical inescapability to sections 5 through 7. The natural inescapability of agency seems to come down to the fact that we cannot opt out of the game of agency, such opting out is just not something we can do. We can, of course, choose to end our lives, but as I also noted in "Agency, Shmagency" (188), far from opting out of the game of agency, this would be a major move within this game. And we can temporarily opt out of this game, say by going to sleep. But still, acting and choosing is, as Korsgaard likes to put things, "our plight"19.

I want to concede that agency is indeed naturally inescapable for us. But I also want to note (as I did, to an extent, in "Agency, Shmagency" (188 and on)) that such inescapability does not matter in our context, and in particular does not render the but- you-do-care response any better. For the move from "You inescapably Φ" to "You should Φ" is no better – not even the tiniest little bit – than the move from "You actually Φ" to "You should Φ".

### 1NC---AFC/ACC

Ci we will defend the violation

Negative testing

Phil ed

Strategic case writing

Inclusion

Real world

### 1NC---AT: Contention

Concede the plan only applies to mega constellations - that means you don’t have an internal link to any of your kant contention offense since it’s all about appropriation writ large and not constellations - cntrl f constellations in any of their offense cards so err heavily negative - also functions as an alt cause to the adv since they only get to solve debris due to mega constellations

Specificity should come first in the context of contention turns because it’s the best determiner of intents

#### There does exist property rights in outer space for mega constellations - the itu grants individual forfeitable permits to companies that occupy orbital slots

Blodger 16 {JD Candidate, 2016, University of Minnesota Law School; BA Hillsdale College, 2013. I would like to thank Professor Carbone and the MJLST editors and staff for their feedback, edits, and guidance throughout this process. "Reclassifying Geostationary Earth Orbit as Private Property: Why Natural Law and Utilitarian Theories of Property Demand Privatization." <https://scholarship.law.umn.edu/cgi/viewcontent.cgi?article=1006&context=mjlst>]

This does not preclude the extension of a countrys legal jurisdiction into the sea, but only precludes the state and private individuals from exercising an ownership interest in the sea.80 This limitation is expressed in the Outer Space Treaty.81 The non-appropriation principles of the treaty are based on the theory that space, like the sea, is a potential medium of transport, and that the occupation of one small part of the area will not foreclose anothers use of the remaining portions of space.82 The current GEO regulation regime also follows the exception proposed by Grotius, that a person may use a common area he occupies for as long as the occupation lasts, as shown by the fact that the ITU only grants temporary, forfeitable licenses to use areas of GEO.83 While these licenses do not confer a property right, they do purport to confer a right to use an area of space; and, even though the ITU likely has no authority to exclude others from operating in the same space, the mere presence of the satellite would deter and likely prevent others from attempting to occupy the same location.84 Thus, the Outer Space Treaty not only relies on Grotius theory as an initial basis for preventing private ownership, but also employs the exceptions Grotius identifies.

#### That’s offense for us - it means the aff infringes on existing property rights regimes and turns promise breaking

#### Acquisition of property can never be unjust – to create rights violations, there must already be an owner of the property being violated, but that presupposes its appropriation by another entity.

Feser 1, (Edward Feser, 1-1-2005, accessed on 12-15-2021, Cambridge University Press, "THERE IS NO SUCH THING AS AN UNJUST INITIAL ACQUISITION | Social Philosophy and Policy | Cambridge Core", Edward C. Feser is an American philosopher. He is an Associate Professor of Philosophy at Pasadena City College in Pasadena, California. [https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)[brackets](https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)%5bbrackets) for gen lang]//phs st

There is a serious difficulty with this criticism of Nozick, however. It is just this: There is no such thing as an unjust initial acquisition of resources; therefore, there is no case to be made for redistributive taxation on the basis of alleged injustices in initial acquisition. This is, to be sure, a bold claim. Moreover, in making it, I contradict not only Nozick’s critics, but Nozick himself, who clearly thinks it is at least possible for there to be injustices in acquisition, whether or not there have in fact been any (or, more realistically, whether or not there have been enough such injustices to justify continual redistributive taxation for the purposes of rectifying them). But here is a case where Nozick has, I think, been too generous to the other side. Rather than attempt —unsatisfactorily, in the view of his critics—to meet the challenge to show that initial acquisition has not in general been unjust, he ought instead to have insisted that there is no such challenge to be met in the first place. Giving what I shall call “the basic argument” for this audacious claim will be the task of Section II of this essay. The argument is, I think, compelling, but by itself it leaves unexplained some widespread intu- itions to the effect that certain specific instances of initial acquisition are unjust and call forth as their remedy the application of a Lockean proviso, or are otherwise problematic. (A “Lockean proviso,” of course, is one that forbids initial acquisitions of resources when these acquisitions do not leave “enough and as good” in common for others.) Thus, Section III focuses on various considerations that tend to show how those intuitions are best explained in a way consistent with the argument of Section II. Section IV completes the task of accounting for the intuitions in question by considering how the thesis of self-ownership itself bears on the acqui- sition and use of property. Section V shows how the results of the previ- ous sections add up to a more satisfying defense of Nozickian property rights than the one given by Nozick himself, and considers some of the implications of this revised conception of initial acquisition for our under- standing of Nozick’s principles of transfer and rectification. II. The Basic Argument The reason there is no such thing as an unjust initial acquisition of resources is that there is no such thing as either a just or an unjust initial acquisition of resources. The concept of justice, that is to say, simply does not apply to initial acquisition. It applies only after initial acquisition has already taken place. In particular, it applies only to transfers of property (and derivatively, to the rectification of injustices in transfer). This, it seems to me, is a clear implication of the assumption (rightly) made by Nozick that external resources are initially unowned. Consider the following example. Suppose an individual A seeks to acquire some previously unowned resource R. For it to be the case that A commits an injustice in acquiring R, it would also have to be the case that there is some individual B (or perhaps a group of individuals) against whom A commits the injustice. But for B to have been wronged by A’s acquisi- tion of R, B would have to have had a rightful claim over R, a right to R. By hypothesis, however, B did not have a right to R, because no one had a right to it—it was unowned, after all. So B was not wronged and could not have been. In fact, the very first person who could conceivably be wronged by anyone’s use of R would be, not B, but A himself, since A is the first one to own R. Such a wrong would in the nature of the case be an injustice in transfer—in unjustly taking from A what is rightfully his—not in initial acquisition. The same thing, by extension, will be true of all unowned resources: it is only after some- one has initially acquired them that anyone could unjustly come to possess them, via unjust transfer. It is impossible, then, for there to be any injustices in initial acquisition.7

#### To own yourself and use your own freedom is to be able to interact with external objects. Anything else makes you unable to exercise your own freedom on other things and creates a contradiction.

Feser 2, (Edward Feser, 1-1-2005, accessed on 12-15-2021, Cambridge University Press, "THERE IS NO SUCH THING AS AN UNJUST INITIAL ACQUISITION | Social Philosophy and Policy | Cambridge Core", Edward C. Feser is an American philosopher. He is an Associate Professor of Philosophy at Pasadena City College in Pasadena, California. [https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)[brackets](https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)%5bbrackets) for gen lang]//phs st

There is. An alternative, soft-line approach could acknowledge that the initial acquirer who abuses a monopoly over a water hole (or any similar crucial resource) does commit an injustice against those who are disad- vantaged, but such an approach could still hold that the acquirer never- theless has not committed an injustice in acquisition —his acquisition was, as I have said, neither just nor unjust. Nor does he fail to own what he has acquired; he still cannot be said to have stolen the water from anyone. Rather, his injustice is an unjust use of what he owns, on a par with the unjust use I make of my self-owned fist when I wield it, unprovoked, to bop you on your self-owned nose. In what sense does the water-hole owner use his water unjustly, though? He doesn’t try to drown anyone in it, after all— indeed, the whole problem is that he won’t let anybody near it! Eric Mack gives us the answer we need in what he has put forward as the “self-ownership proviso” (SOP).28 This is a proviso not (as the Lock- ean proviso is) on the initial acquisition of property, but rather on how one can use his property in a way that respects others’ self-ownership rights. It is motivated by consideration of the fact that the talents, abilities, capac- ities, energies, etc., that a person rightfully possesses as a self-owner are inherently “world-interactive”; that is, it is of their very essence that they are directed toward the extra-personal environment.29 Your capacity to use your hand, for instance, is just a capacity to grasp and manipulate external objects; thus, what you own in owning your hand is something essentially grasping and manipulating.30 Now if someone were to cut off your hand or invasively keep you from using it (by tying your arm against your body or holding it behind your back), he would obviously be violating your self-ownership rights. But there are, Mack suggests, other, noninvasive ways in which those rights might be violated. If, to use an example of Mack’s, I effectively nullify your ability to use your hand by creating a device that causes anything you reach for to be propelled beyond your grasp, making it impossible for you ever to grasp or manip- ulate anything, I have violated your right to your hand as much as if I had cut it off or tied it down. I have, in any case, prevented your right to your hand from being anything more than a formal right, one that is practically useless. In the interests of guaranteeing respect for substantive, robust rights of self-ownership, then, “[t]he SOP requires that persons not deploy their legitimate holdings, i.e., their extra-personal property, in ways that severely, albeit noninvasively, disable any person’s world-interactive powers.” 31 The SOP follows, in Mack’s view, from the thesis of self-ownership itself; or, at any rate, the considerations that would lead anyone to accept that thesis should also, in his view, lead one to accept the proviso.32 A brief summary of a few of Mack’s thought experiments should suffice to give a sense of why this is so.33 In what Mack calls the Adam’s Island example, Adam acquires a previously uninhabited island and later refuses a shipwrecked Zelda permission to come ashore, as a result of which she remains struggling at sea (and presumably drowns). In the Paternalist Caging example, instead of drowning, Zelda becomes caught offshore in a cage Adam has constructed for catching large sea mammals, and, rather than releasing her, Adam keeps her in the cage and feeds her regularly. In the Knuckle-Scraper Barrier example, Zelda falls asleep on some unowned ground, whereupon a gang of oafish louts encircles her and, using their bodies and arms as barriers, refuses to let her out of the circle (accusing her of assault if she touches them in order to climb over or break through). In the Disabling Property Barrier example, instead of a human barrier, Adam constructs a plastic shield over and around the unowned plot of ground upon which Zelda sleeps, accusing her of trespassing upon his property when she awakens and tries to escape by breaking through the plastic. And in the (similarly named) Disabling Property Barriers example, seem to suggest an Aristotelian-Thomistic conception of natural function, and though this by no means troubles me, it might not be what Mack himself has in mind (nor, of course, is it something every philosopher is going to sympathize with). Mack’s view nevertheless seems to require something like this conception. And something like it —enough like it to do the job Mack needs to be done, anyway—is arguably to be found in Larry Wright’s well- known reconstruction, in modern Darwinian terms, of the traditional notion of natural function. See Larry Wright, “Functions,” Philosophical Review 82, no. 2 (1973): 139–68. Adam, instead of enclosing Zelda in a plastic barrier, encloses in plastic barriers every external object that Zelda would otherwise be able to use — thus, in effect, enclosing her in a larger, all-encompassing plastic barrier of a more eccentric shape. In all of these cases, Mack says, although Zelda’s formal rights of self-ownership have not been violated—no one has invaded the area enclosed by the surface of her skin —her rights over her self-owned powers, and in particular her ability to exercise those powers, have nevertheless been nullified. But a plausible self-ownership- based theory surely cannot allow for this. It cannot, for instance, allow the innocent Zelda justly to be imprisoned in any of the ways described! If Mack is right, then it seems we have, in the SOP, grounds for holding that a water-hole monopolist would indeed be committing an injustice against anyone he refuses water to, or to whom he charges exorbitant prices for access. The injustice would be a straightforward violation of a person’s rights to self-ownership, a case of nullifying a person’s self- owned powers in a way analogous to Adam’s or the knuckle-scrapers’ nullification of Zelda’s self-owned powers. It would not be an injustice in initial acquisition, however. The water-hole monopolist still owns the water hole as much as he ever did; he just cannot use it in a way that violates other individuals’ self-ownership rights (either by drowning them in it or by nullifying their self-owned powers by denying them access to it when there is no alternative way for them to gain access to the water necessary for the use of their self-owned powers). Is Mack right? The hard-liner might dig in his heels and insist that none of Mack’s examples amount to self-ownership-violating injustices; instead, they are merely subtle but straightforward property rights violations or cases of moral failings of various other sorts (cruelty, selfishness, etc.). The Adam’s Island case, for starters, is roughly analogous to the example of the water-hole monopolist, so that it arguably cannot give any non-question- begging support to the SOP, if the SOP is then supposed to show that the water-hole example involves an injustice. The Disabling Property Barriers case might also be viewed as unable to provide any non-question-begging support, since Adam’s encasing everything in plastic might plausibly be interpreted as his acquiring everything, in which case we are back to a water-hole-type monopoly example. The Knuckle-Scraper Barrier and Dis- abling Property Barrier examples might be explained by saying that in falling asleep on the unowned plot of land, Zelda in effect has come (at least temporarily) to acquire it, and (by virtue of walking) to acquire also the path she took to get to it, so that the knuckle-scrapers and Adam violate her property rights (not her self-ownership rights) in not allowing her to escape. The Paternalist Caging example can perhaps be explained by arguing that in building the cage, Adam has acquired the water route leading to it, so that in swimming this route (and thus getting caught in the cage) Zelda has violated his property rights and, therefore, can justly be caged. Accordingly, the hard-liner might insist, we can explain all of these examples in a hard-line way and thus avoid commitment to the SOP. Such a hard-line response would be ingenious (well, maybe), but still, I think, ultimately doomed to failure. Can the Paternalist Caging example, to start with, plausibly be explained away in the manner that I have suggested? Does Adam commit no injustice against Zelda even if he never lets her out? It will not do to write this off merely as a case of excessive punishment (explaining the injustice of which would presumably not require commitment to the SOP). For suppose Adam says, after a mere five minutes of confinement, “I’m no longer punishing you; you’ve paid your debt and are free to go, as far as I’m concerned. But I’m not going to bother exerting the effort to let you out. I never forced you to get in the cage, after all —you did it on your own —and you have no right to the use of my self-owned cage-opening powers to fix your mistake! So teleport out, if you can. Or get someone else —if you can find someone —to let you out.” Adam would be neither violating Zelda’s rights to external property nor excessively punishing her in this case; nor would he be invasively vio- lating her self-ownership rights. But wouldn’t he still be committing an injustice, however noninvasively? Don’t we need something like the SOP to explain why this is so? The barrier examples, for their part, do not require Zelda’s walking and falling asleep on virgin territory, which thus (arguably) becomes her prop- erty. We can, to appeal to the sort of science-fiction scenario beloved of philosophers, imagine instead a bizarre chance disruption of the structure of space-time that teleports Zelda into Adam’s plastic shell or into the midst of the knuckle-scrapers. There is no question now of their violating her property rights; yet don’t they still commit an injustice by nullifying her self-owned powers in refusing to allow her to exit? Consider a parallel example concerning property ownership itself. If your prized $50,000 copy of Captain America Comics number 1, due to another rupture in space-time or just to a particularly strong wind that blows it out of your hands and through my window, suddenly appears on the floor of my living room, do I have the right to refuse to bring it back out to you or to allow you to come in and get it? Suppose I attempt to justify my refusal by saying, “I won’t touch it, and you’re free to have it back if you can arrange another space-time rupture or gust of wind. But I refuse to exert my self-owned powers to bring it out to you, or to allow you on my property to get it. I never asked for it to appear in my living room, after all!” Would anyone accept this justification? Doesn’t your property right in the comic book require me to give it back to you? The hard-liner might suggest that this example transports the SOP advocate out of the frying pan and into the fire. For if the SOP is true, wouldn’t we also have to commit ourselves to a “property-ownership proviso” (POP) that requires us not to nullify anyone’s ability to use his external private property in a way consistent with its “world-interactive powers”? If I build a miniature submarine in my garage, and you have the only swimming pool within one thousand miles, must you allow me the use of your pool lest you nullify my ability to use the sub? If (to take an example of Cohen’s cited by Mack) I own a corkscrew, must I be provided with wine bottles to open lest the corkscrew sadly fail to fulfill its full potential?34 Mack’s response to this line of thought seems basically to amount to a bit of backpedaling on the claim that his proviso really follows from the notion of self-ownership per se —so as to avoid the conclusion that a (rather unlibertarian and presumably redistributionist) POP would also, in par- allel fashion, follow from the concept of property ownership. His response seems, instead, to emphasize the idea that the considerations favoring self-ownership also favor, via an independent line of reasoning, the SOP.35 In my view, however, a better response would be one that took note of some relevant disanalogies between property in oneself and property in external things. Note first that the self-owned world-interactive powers, the possible use of which the SOP is intended to guarantee, are possessed by a living being who is undergoing development, which involves passing through various stages; therefore, these powers are ones that flourish with use and atrophy or even disappear with disuse.36 To nullify these powers even for a limited time, then, is (very often at least) not merely temporarily to inconvenience their owner, but, rather, to bring about a permanent reduc- tion or even disablement of these powers. By contrast, a submarine (or a corkscrew) retains its powers even when left indefinitely in a garage (or a drawer). This difference in the effect that nullification has on self-owned powers versus extra-personal property plausibly justifies a difference in our judgments concerning the acceptability, from the point of view of justice, of such nullification in the two cases; that is, it justifies adoption of the SOP but not of the POP.37 Second, there is an element of choice (and in particular, of voluntary acquisition) where extra-personal property is concerned that is morally relevant here. One’s self-owned powers, along with the SOP-guaranteed right to the non-nullification of those powers, are not something one chooses or acquires; one just has them —indeed, to a great degree one just is the constellation of those powers, abilities, etc.—and owns them fully. By contrast, extra-personal property is something one chooses to acquire or not to acquire, and as we have seen, one always acquires property rights in various degrees, from partial to full ownership—and this would include the rights guaranteed by a POP. If one chooses to acquire a corkscrew under conditions where wine bottles are unavailable, or are even likely at some point to become unavailable, one can hardly blame others if one finds oneself bottle-less. To fail to acquire POP-like rights regarding the corkscrew (by, say, contracting with someone else to provide one with wine bottles in perpetuity) is not the same thing as to have those rights and then have them violated. Someone who buys a corkscrew and then finds that he cannot use it is like the person who acquires only partial property rights in a water hole that others have already acquired partial use rights over. He cannot complain that his co-owners have violated his rights; he never acquired those other rights in the first place. Similarly, the corkscrew owner cannot complain that he has no bottles to open; he never acquired the right to those bottles, only to the corkscrew. If full ownership of a corkscrew requires POP-like rights over it, then all that follows is that corkscrew owners who lack bottles are not full owners of their corkscrews.

#### Thus, self-ownership justifies the appropriation of property – our freedom necessitates being able to set and pursue external things as our ends, including exercising our rights on property. Restricting this arbitrarily limits our freedom which is unjust.

Feser 3, (Edward Feser, 1-1-2005, accessed on 12-15-2021, Cambridge University Press, "THERE IS NO SUCH THING AS AN UNJUST INITIAL ACQUISITION | Social Philosophy and Policy | Cambridge Core", Edward C. Feser is an American philosopher. He is an Associate Professor of Philosophy at Pasadena City College in Pasadena, California. [https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)[brackets](https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/there-is-no-such-thing-as-an-unjust-initial-acquisition/5C744D6D5C525E711EC75F75BF7109D1)%5bbrackets) for gen lang]//phs st

V. Some Implications If what I have argued so far is correct, then the way is opened to the following revised case for strongly libertarian Lockean-Nozickian prop-erty rights: We are self-owners, having full property rights to our body parts, powers, talents, energies, etc. As self-owners, we also have a right, given the SOP, not to have our self-owned powers nullified —we have the right, that is, to act within the extra-personal world and thus to acquire rights to extra-personal objects that the use of our self-owned powers requires.39 This might involve the buying or leasing of certain rights or bundles of rights and, correspondingly, the acquiring of lesser or greater degrees of ownership of parts of the external world, but as long as one is able to exercise one’s powers to some degree and is not rendered incapable of acting within that world, the SOP is satisfied. In any case, such rights can only be traded after they are first established by initial acquisition. In initially acquiring a resource, an agent does no one an injustice (it was unowned, after all). Furthermore, [they] has mixed [their] labor with the resource, significantly altering it and/or bringing it under his control, and is himself solely responsible for whatever value or utility the resource has come to have. Thus, [they] has a presumptive right to it, and, if his control and/or alteration (and thus acquisition) of it is (more or less) complete, his own- ership is accordingly (more or less) full. The system of strong private property rights that follows from the acts of initial acquisition performed by countless such agents results, as a matter of empirical fact, in a market economy that inevitably and dramatically increases the number of resources available for use by individuals, and these benefited individuals include those who come along long after initial acquisition has taken place. (Indeed, it especially includes these latecomers, given that they were able to avoid the hard work of being the first to “tame the land” and draw out the value of raw materials.)40 The SOP is thus, in fact, rarely, if ever, violated. The upshot is that a system of Lockean-Nozickian private property rights is morally justified, with a strong presumption against tampering with exist- ing property titles in general. In any case, there is a strong presumption against any general egalitarian redistribution of wealth, and no case what- soever to be made for such redistribution from the general theory of prop- erty just sketched, purged as it is of the Lockean proviso, with all the egalitarian mischief-making the proviso has made possible.

#### No aliens – err towards humans

Greene 19, Tristan. “NASA research shows alien life is far less likely than previously thought.” Next Web. June 12, 2019. <https://thenextweb.com/science/2019/06/12/nasa-research-shows-alien-life-is-far-less-likely-than-previously-thought/>

Scientists just threw a monkey wrench in the search for intelligent extraterrestrial life by redefining what a “habitable planet” is. A team of researchers led by NASA astrobiologist Edward Schwieterman recently published a study indicating that the habitable zone (HZ) for life includes far fewer planetary systems than scientists thought. Rented shoes are gross But bowling is fun! Join us for Bowlr, Amsterdam’s best networking event YEAH! According to the paper: Here we show that the HZ for complex aerobic life is likely limited relative to that for microbial life. We use a 1D radiative-convective climate and photochemical models to circumscribe a Habitable Zone for Complex Life (HZCL) based on known toxicity limits for a range of organisms as a proof of concept. Basically the scientists used the only model for life we have – Earth life – and came up with a solution for determining whether anything intelligent could evolve in the expected conditions of systems in the HZ. They concluded that a large number of planets thought capable of supporting life have toxic atmospheres unlikely to support any lifeforms beyond the most rudimentary organisms. According to study co-author Timothy Lyons, distinguished professor of biogeochemistry at the University of California, Riverside, previous ideas on what makes a planet habitable haven’t taken such a specific view. He told NASA: This is the first time the physiological limits of life on Earth have been considered to predict the distribution of complex life elsewhere in the universe. So what does it actually mean? Well, that depends on your belief system. Scientifically speaking, the search for alien life is based on faith. There’s no more evidence for alien life than there is for the various gods and goddesses of Earth‘s religions. Though there are mountains of evidence to support the idea that humans believe in aliens for the exact same reasons they believe in religion. That’s not to say that intelligent alien life is impossible. It’s just highly improbable. We know that the evolution of complex beings took billions of years on Earth, and we know our planet is so fragile that it almost surely wouldn’t have survived long enough to support that life were it not for Jupiter and Saturn out front blocking asteroids for us. And there’s countless other instances of conditions in our planet’s history so improbably perfect that life itself, even on a single planet, only seems possible because we’re experiencing it. Supposedly, anyway. This research shows that when you strip away our yearning, burning desire to find something to help us make sense of our own existence: you’re left with a universe that probably can’t support complex life anywhere but on Earth. As Schwieterman told USA Today: Showing how rare and special our planet is only enhances the case for protecting it. As far as we know, Earth is the only planet in the universe that can sustain human life. Sure, intelligent aliens could be deliberately concealing themselves to watch us from afar; they could be invisible to our senses and existing beside us in spiritual form, or simply beyond the reach of our current technology. The absence of evidence isn’t the evidence of absence. But climate crisis, war, disease, hunger, and poverty are demonstrably real. With no evidence for ET, maybe it’s time we made helping humans our new religion instead of seeking out neighbors we ought to be embarrassed to invite over.

#### We won’t find aliens, and machines—not aliens—would come if we did

Rowan 10 (Karen Rowan is a Health Editor for LiveScience with a Master’s degree in science and medical journalism from Boston University and in cellular biology from Northeastern Illinois University and has previously written for the Journal of the National Cancer Institute, “Could Extraterrestrials Really Invade Earth, and How?”, LiveScience, 4/28/10, <https://www.livescience.com/32557-could-extraterrestrials-really-invade-earth-and-how.html>) //EG

"In movies, aliens only come here for two reasons," Seth Shostak, senior astronomer at the Search for Extraterrestrial Intelligence (SETI) told Life's Little Mysteries. "They either come here to find some resource they don't have on their own planet, or they want to use us for some unauthorized breeding experiment." These scenarios play on our most primal human fears of losing the resources we need to survive or not being able to reproduce, Shostak said.

In reality, it isn't logical to think that aliens would want to do either of those things, Shostak said. Space travel is expensive and requires an enormous investment, he said.

"Anything that we have here, they could find where they live," Shostak said. If there was a resource found on Earth that did not exist on [the aliens' home planet](http://www.space.com/scienceastronomy/extrasolar_planets.html), there would certainly be easier ways to get or make the resource than coming here.

And if an alien civilization was advanced enough to engage in [interstellar travel](http://www.space.com/businesstechnology/080313-tw-centauri-travel.html), they would also probably have very advanced robotic machines, Shostak said. If they wanted to research our planet, they would be more likely to send those machines here than to come here themselves.

"It's not like, the hatch will open and we'll see a strange, alien paw coming out," he said. "It's more likely to be a robotic arm."

Contact with aliens is extremely unlikely, agrees David Morrison, Director of Space at NASA-Ames Research Center. Any communication that may occur would likely be in the form of radio waves sent from one civilization to another, he said.

"We're listening for radio signals," Morrison said, "And we can assume that any civilization that we receive a signal from is more advanced than we are."

We have only had the technology to listen and [send radio waves](http://www.space.com/scienceastronomy/080701-st-earth-sounds.html) for the last century, so if an alien radio signal reaches us from a distant planet hundreds or thousands of light-years away, that civilization would have to be more advanced than ours, Morrison said.

Morrison doubts that an advanced alien civilization would come here to harm us.

"Someone once suggested that if a civilization can last for hundreds of thousands of years, it almost surely has solved the problems we have. I would hope so," Morrison said.

Even if aliens existed, knew about us, and could travel here, they wouldn't be likely to send an army or the equipment needed to launch an attack on the Earth, said science fiction writer Jack McDevitt.

"Imagine putting together an invasion force, only to stick them in containers to travel here for years," McDevitt said.

Although contact between humans and aliens has been a key part of many of McDevitt's books, he doesn't think that it's likely to actually happen. It would take a great amount of time for aliens to reach Earth, and any civilization capable of this feat would not want to delegate its fighting force to the task, he said.

We have bigger problems to worry about, McDevitt said.

### 1NC---AT: Adv

#### Squo debris thumps

**Wall 21** [Mike Wall, Michael Wall is a Senior Space Writer with [Space.com](http://space.com/) and joined the team in 2010. He primarily covers exoplanets, spaceflight and military space. He has a Ph.D. in evolutionary biology from the University of Sydney, Australia, a bachelor's degree from the University of Arizona, and a graduate certificate in science writing from the University of California, Santa Cruz. 11/15/21, "Kessler Syndrome and the space debris problem," Space, [https://www.space.com/kessler-syndrome-space-debris accessed 12/10/21](https://www.space.com/kessler-syndrome-space-debris%20accessed%2012/10/21)] Adam

Earth orbit is getting more and more crowded as the years go by. Humanity has launched about 12,170 satellites since the dawn of the space age in 1957, [according to the European Space Agency](https://www.esa.int/Safety_Security/Space_Debris/Space_debris_by_the_numbers) (ESA), and 7,630 of them remain in orbit today — but only about 4,700 are still operational. That means there are nearly 3,000 defunct spacecraft zooming around Earth at tremendous speeds, along with other big, dangerous pieces of debris like upper-stage rocket bodies. For example, orbital velocity at 250 miles (400 kilometers) up, the altitude at which the ISS flies, is about 17,100 mph (27,500 kph). At such speeds, even a tiny shard of debris can do serious damage to a spacecraft — and there are huge numbers of such fragmentary bullets zipping around our planet. ESA estimates that Earth orbit harbors at least 36,500 debris objects that are more than 4 inches (10 centimeters) wide, 1 million between 0.4 inches and 4 inches (1 to 10 cm) across, and a staggering 330 million that are smaller than 0.4 inches (1 cm) but bigger than 0.04 inches (1 millimeter). These objects pose more than just a hypothetical threat. From 1999 to May 2021, for example, the ISS conducted 29 debris-avoiding maneuvers, including three in 2020 alone, [according to NASA officials](https://www.nasa.gov/mission_pages/station/news/orbital_debris.html). And that number continues to grow; the station performed [another such move in November 2021](https://www.space.com/space-station-dodging-chinese-space-junk-spacex-crew-3), for example. Many of the smaller pieces of space junk were spawned by the explosion of spent rocket bodies in orbit, but others were more actively emplaced. In January 2007, for instance, China intentionally destroyed one of its defunct weather satellites in a much-criticized test of anti-satellite technology that generated [more than 3,000 tracked debris objects](https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf) and perhaps 32,000 others too small to be detected. The vast majority of that junk remains in orbit today, experts say. Spacecraft have also collided with each other on orbit. The most famous such incident occurred in February 2009, when Russia's defunct Kosmos 2251 satellite slammed into the operational communications craft Iridium 33, producing [nearly 2,000 pieces of debris](https://swfound.org/media/6575/swf_iridium_cosmos_collision_fact_sheet_updated_2012.pdf) bigger than a softball. That 2009 smashup might be evidence that the Kessler Syndrome is already upon us, though a cataclysm of "Gravity" proportions is still a long way off. "The cascade process can be more accurately thought of as continuous and as already started, where each collision or explosion in orbit slowly results in an increase in the frequency of future collisions," [Kessler told Space Safety Magazine in 2012](http://www.spacesafetymagazine.com/space-debris/kessler-syndrome/don-kessler-envisat-kessler-syndrome/).

#### Collision risk is infinitesimally small

Fange 17 Daniel Von Fange 17, Web Application Engineer, Founder and Owner of LeanCoder, Full Stack, Polyglot Web Developer, “Kessler Syndrome is Over Hyped”, 5/21/2017, http://braino.org/essays/kessler\_syndrome\_is\_over\_hyped/

The orbital area around earth can be broken down into four regions. Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over. High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue. Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here. GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here. How bad could Kessler Syndrome in High LEO be? Let’s imagine a worst case scenario. An evil alien intelligence chops up everything in High LEO, turning it into 1cm cubes of death orbiting at 1000km, spread as evenly across the surface of this sphere as orbital mechanics would allow. Is humanity cut off from space? I’m guessing the world has launched about 10,000 tons of satellites total. For guessing purposes, I’ll assume 2,500 tons of satellites and junk currently in High LEO. If satellites are made of aluminum, with a density of 2.70 g/cm3, then that’s 839,985,870 1cm cubes. A sphere for an orbit of 1,000km has a surface area of 682,752,000 square KM. So there would be one cube of junk per .81 square KM. If a rocket traveled through that, its odds of hitting that cube are tiny - less than 1 in 10,000.

#### State-sponsored programs make space militarization inevitable

Nagashiwa 20 [(Jun, Adjunct Professor at the National Defense Academy’s Graduate School of Security Studies in Japan, former Lieutenant General, MA in European Security from Tsukuba University) “The Militarization of Space and its Transformation into a Warfighting Domain,” Sasakawa Peace Foundation, 7/17/2020] JL

In 2018, the United States issued its first National Space Strategy, which recognized that its adversaries had turned space into a warfighting domain[1].Military use of space began with the Sputnik crisis in October 1957[2], which initiated the space race between the U.S. and the Soviet Union. More recently, a growing number of countries are pursuing military uses of space. India conducted an anti-satellite weapons test in March 2019 and Iran launched its first military satellite launch in April. In its reorganization in 2015, the Chinese PLA established the Strategic Support Force, which handles the fields of space, cyber, and the electromagnetic spectrum. Russia also set up an independent Space Force in the same year. In response to these developments, France established the Space Command in September 2019, and the U.S. organized the Space Force last December.

In January 2007, China carried out an anti-satellite destruction test using anti-satellite weapons (ASAT), triggering the development of space as a warfighting domain in the post-Cold War era. China needed to build asymmetric capabilities in space and cyberspace[3]as a response to an expected contingency in the Taiwan Strait. This test created a large amount of space debris and was met with intense international criticism[4]. Although space was used militarily for decades during the Cold War, both the U.S. and the Soviet Union refrained from these kinds of tests because careless physical attacks could have a significant impact on all operations in space[5]. However, China, which is pursuing a strategy of asymmetric warfare, has set foot into this “sanctuary,” and forced the United States to recognize the vulnerability of its space system[6].

Space has enormous potential for not only the development of science and technology, but also for economic growth. Globalized society is increasingly dependent on the space system, and Japan is participating in the U.S.-led Artemis Program, which aims to explore lunar space. China, which aspires to global economic leadership, is also moving to make use of cislunar space[7], and is expected to work with Russia[8]. Non-military competition in acquiring growth resources in space has already begun through the development and use of relevant technologies. Next-generation information and communications technology (ICT), quantum computing and other such technologies will reduce the vulnerability of space systems.

As space becomes a more important resource, increasing the resilience of space systems has become an urgent issue. There were about 20,000 pieces of space debris as of November 2019[9], and more players are set to enter the field with new business models that use a constellation of small, cheaper satellites. As a result, “congestion” in space is expected to become more serious. Furthermore, in addition to kinetic threats like ASAT and physical deterioration, non-kinetic threats like cyberattacks and laser obstruction are becoming more dangerous. The vulnerability of space systems will inevitably increase.

In the June 2020 U.S. Defense Space Strategy, China and Russia are labelled as the biggest operational threats to the U.S. in outer space, and are designated as parties who have weaponized space and turned it into an area of great power competition. Both China and Russia, which prioritize their own usage of space, are criticized for trying to prevent other countries from freely utilizing space[10].

Space is becoming a less stable environment, even as it holds the promise of becoming a new source of human prosperity.

There are growing signs that space is being utilized for security as the concept of the battlefield has changed with advances in technology[11].Technologies to address air and missile threats are a clear example of this. The accuracy and reliability of ballistic missile defense (BMD) systems has improved in recent years, but developments in offensive technologies have outpaced this progress. China and Russia are developing flying object threats that overwhelm defensive reaction capability in Western countries. Hypersonic glide vehicles (HGV), for example, travel at Mach 5 or higher, and missile threats with orbital change capabilities are difficult to intercept.

#### Debris creates deterrence by raising the bar for conflict – international norms fail

Miller 7/31 [(Gregory, Chair of the Department of Space Power at the Air Command and Staff College, Ph.D. in Political Science from The Ohio State University) “Deterrence by Debris: The Downside to Cleaning up Space,” Space Policy, 7/31/2021] JL

The danger of kinetic strikes increasing orbital debris is a common theme in the literature, but the positive deterrent effects of some debris are often overlooked. The debris resulting from destroyed satellites, or other space objects, creates a deterrent effect on actors who might otherwise violate international norms and strike at objects in space, either to test their capabilities or as an act of hostilities. This is not deterrence in the traditional sense, of one actor publicly threatening punishment in response to another actor’s unwanted actions. It is not deterrence by denial since the attacker is not damaged and may even achieve its objective. Nor is it deterrence by punishment because the debris itself does not threaten to punish the attacker’s country. But debris can increase the future costs to the aggressor, even if their initial attack succeeds, and thus it has a similar restraining effect on certain behavior. Like the automated response of the U.S. tripwire in West Germany, the threat that debris can pose to state interests acts as a form of deterrence, at least to prevent some actors from taking certain types of actions. Removing the danger of debris will weaken that restraint and thus weaken deterrence, making ASAT tests and hostile actions in space more likely.

Several factors may deter a state from launching kinetic tests or striking against an adversary’s interests in space. For one thing, if a state’s adversary has similar capabilities to destroy objects in space, deterrence would be a function of not wanting to escalate tensions. Although international law only explicitly prohibits states from placing weapons of mass destruction in orbit, international space law, like the Outer Space Treaty [30], does provide a framework for addressing the activities of one state that lead to the damage of another state’s property. Likewise, there are international norms (informal but expected rules of behavior) against the weaponization of space. But these norms seem to be in decline [31], and such norms only deter a state from engaging in certain types of behavior if the state cares about following norms, if it cares about how states perceive its behavior, or if it believes other states are willing to enforce the norms. The beauty of debris as a deterrent is that it does not rely on the enforcement of norms or the credibility of states to succeed.

#### Deterrence

**Pavur and Martinovic 19** [James Pavur and Ivan Martinovic, May 2019, "The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space," ResearchGate, 11th International Conference on Cyber Conflict: Silent Battle [https://www.researchgate.net/publication/334422193\_The\_Cyber-ASAT\_On\_the\_Impact\_of\_Cyber\_Weapons\_in\_Outer\_Space accessed 12/10/21](https://www.researchgate.net/publication/334422193_The_Cyber-ASAT_On_the_Impact_of_Cyber_Weapons_in_Outer_Space%20accessed%2012/10/21)]Adam

A. Limited Accessibility

Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420].

Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23].

B. Attributable Norms

There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit.

Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly.

One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime.

C. Environmental Interdependence

A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Rockets don’t effect:

#### 1] Percentage of Contribution is Low

Boyle 18 Alan Boyle 3-24-2018 "Do rockets blast away the ozone layer? It’s no biggie today … but watch the skies" <https://www.geekwire.com/2018/rockets-blast-away-ozone-layer-no-biggie-today-watch-skies/> (Alan Boyle is an award-winning science writer and space reporter and GeekWire contributing editor.)//Elmer

Thanks to Blue Origin, SpaceX and other space ventures, the skies could well be filled with rockets in years to come. But what will that do to the environment? The short answer is, not that much right now. But as experts look to the years ahead, the answer gets as hazy as the air after a Falcon Heavy launch. “Ten years ago, the amount of emissions was not great,” said Martin Ross, an engineer at the Aerospace Corp. whose research focuses on the effects of space systems on the stratosphere. “Today, the effect is still small, but it’s growing.” Over the 60 years of the Space Age, the year-by-year tally of orbital launches has gone up and down, with the most active years coming during the height of the U.S.-Soviet space race and the start of the space shuttle era. Now the rate is on a sharp upswing, and if all of the plans being hatched by launch providers come to fruition, 2018 could well be a record year. Ross focuses on ozone-depleting chemicals rather than climate change — even though most rocket emissions take the form of carbon dioxide and water vapor, two of the best-known greenhouse gases. “The carbon dioxide emitted by rockets is absolutely and completely insignificant compared with aviation,” Ross explained. And aircraft, in turn, are thought to account for less than 10 percent of the total greenhouse-gas emissions linked to the U.S. transportation sector. (That’s compared with more than 80 percent for cars and trucks.)

#### 2] No Pollution

NSS 21 7-23-2021 "Why Space Tourism?" <https://space.nss.org/why-space-tourism/> (National Space Society)//Elmer

Space Tourism Will Not Be a Pollution Disaster It is possible to accept all the benefits above, and still express concern about the potential that a really successful space tourism industry will pollute the air and contribute to global warming. Fortunately, Blue Origin’s New Shepard produces only water as an exhaust, so neither is going to be an issue even if there are 1,000s of flights per year. Some have claimed that space tourism will be more polluting per passenger mile since there are fewer passengers per vehicle at the current time, but (a) New Shepard has zero carbon/zero pollution, and (b) over time space tourism vehicles will grow in capacity, just like airliners did. The Virgin Galactic engine is more problematic, but will most likely be replaced by a more sustainable engine before flight volumes become large. Some might be more worried about SpaceX’s StarShip/SuperHeavy driving global warming when used for point-to-point travel on the Earth, and for space tourism. Elon Musk has declared his intention to produce the methane fuel it uses directly from the atmosphere using solar power, assuring that the fuel cycle is carbon-neutral. In terms of air pollution, StarShip in a point-to-point mode will to a large degree replace airplanes currently flying while using cleaner burning methane, potentially resulting in less pollution than is the case currently. In any case, trips to space will likely always remain a minor part of point-to-point travel on the Earth. Currently, in the U.S. alone, there are about 5,700 passenger flights PER DAY. Even if we are simultaneously supporting dozens of orbital hotels, building a city on Mars, and constructing a network of space solar power satellites, we will be hard