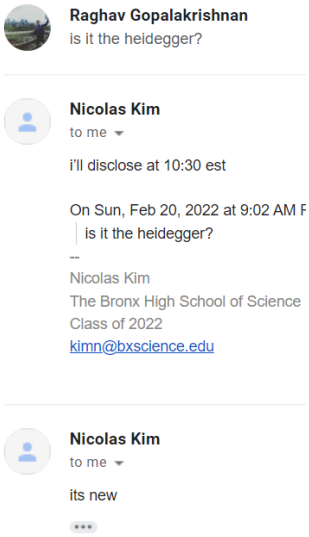
1

Interpretation: Debaters must disclose new affirmatives on the wiki 30 minutes before they are read in round.

Violation: You didn't



Raghav Gopalakrishnan
is it the heidegger?

Nicolas Kim
to me
i'll disclose at 10:30 est

On Sun, Feb 20, 2022 at 9:02 AM R
is it the heidegger?
--
Nicolas Kim
The Bronx High School of Science
Class of 2022
kimn@bxscience.edu

Nicolas Kim
to me
its new

Net benefits -

1 - Testing: There are hundreds of potential aff positions, disclosure of the aff directs pre-round prep which ensures the debate is about the substance of the position as opposed to generics, which is key to nuanced clash and in depth debate. Their interpretation forces the negative to read frivolous theory or kritiks with overly broad points of disagreement with the aff.

2 - Edu - if you had disclosed your aff before then maybe we could've had a better discussion which promotes edu in round

3 - Clash - 6-8 minutes isn't enough to prep out an entire 1NC that clashes with the neg. Fundamentally unfair and skewed towards the aff because it limits quality engagement

4 - Fairness is a virtue - manipulating your new aff to win a ballot and to screw me over is not virtuous lol its greedy

Vote on fairness because it is axiomatically necessary to determine the better debater over the better cheater

Vote on education because it is the reason why schools fund debate

Use competing interps:

Reasonability is arbitrary which invites judge intervention or random unjustified thresholds.

Competing interpretations deters future abuse by creating consistent norms that debaters can be held to in the future.

No RVIs on 1NC Theory - you have plenty of time to respond to it and its k2 checking against 1AC abuse you don't get an RVI for "not being abusive"

Drop the debater:

Deters future abuse the greatest incentive in debate is competitive success so debaters won't read positions if they can't win on them.

2

The Standard is maximizing expected wellbeing

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 – Extinction outweighs under any framework

Pummer 15 [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. "Moral Agreement on Saving the World" Practical Ethics, University of Oxford. May 18, 2015] AT

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – **whether we're consequentialists, deontologists, or virtue ethicists** – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how **reducing existential risk is easily the most important thing in the whole world.** This is for the familiar reason that there are **so many people who could exist in the future** – there are **trillions upon trillions**… upon trillions. There are so many possible future people that **reducing existential risk is arguably the most important** thing in the world, **even if the well-being of these possible people were given only 0.001% as much weight** as that of existing people. Even on a wholly person-affecting view – according to which there's nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there's a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But **that is a huge mistake.** Non-consequentialism is the view that there's more that determines rightness than the goodness of consequences or outcomes; **it is not the view that the latter don't matter.** Even John Rawls wrote, "All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy." **Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good**, from an impartial point of view. They'd thus imply very strong reasons to reduce existential risk, at least when this doesn't significantly involve doing harm to others or damaging one's character. What's even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial "point of view of the universe," indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply

strong reasons to reduce existential risk. It will depend, among other things, on what one's own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don't care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler's recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I'd have very strong reason to reduce existential risk. **We should also take into account moral uncertainty.** What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I've just argued that there's agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, **even if we are only 1% sure that** the **well-being** of possible future people **matters,** it is at least arguable that, **from** the standpoint of **moral uncertainty, reducing existential risk is the most important thing in the world.** Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It's possible they'll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, **all minimally plausible moral views would converge on the conclusion that we should try to save the world.** While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won't get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: "We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe,

make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly." (From chapter 36 of On What Matters)

3 – Death is bad and o/w—ontologically destroys the subject.

Paterson 1 – Department of Philosophy, Providence College, Rhode Island. (Craig, "A Life Not Worth Living?", Studies in Christian Ethics, http://sce.sagepub.com)

Contrary to those accounts, I would argue that it is **death** per se that is really the **objective evil** for us, not because it deprives us of a prospective future of overall good judged better than the alter- native of non-being. It cannot be about harm to a former person who has ceased to exist, for no person actually suffers from the sub-sequent non-participation. Rather, death in itself is an evil to us because it **ontologically destroys the current existent subject** – it is the ultimate in **metaphysical lightening strikes**.80 The evil of death is truly an ontological evil borne by the person who already exists, **independently of calculations about better or worse** possible lives**. Such an evil need not be consciously experienced** in order to be an evil for the kind of being a human person is. Death is an evil because of the change in kind it brings about, a change that is destructive of the type of entity that we essentially are. **Anything**, whether caused naturally or caused by human intervention (intentional or unintentional), **that drastically interferes in the process of maintaining the person in existence is an objective evil** for the person. What is crucially at stake here, and is dialectically supportive of the self-evidency of the basic good of human life, is that death is a radical interference with the current life process of the kind of being that we are. In consequence, **death itself can be credibly thought of as a 'primitive evil' for all persons, regardless of the extent to which they are currently or prospectively capable of participating in a full array of the goods of life.**81 In conclusion, concerning willed human actions, it is justifiable to state that **any intentional rejection of human life itself cannot therefore be warranted since it is an expression of an ultimate disvalue** for the subject, namely, the destruction of the present person; a radical ontological good that we cannot begin to weigh objectively against the travails of life in a rational manner. To deal with the sources of disvalue (pain, suffering, etc.) we should not seek to irrationally destroy the person, the very source and condition of all human possibility.82

4 – Motivation - Consequentialism is the only metric that consistently motivates actors since desires are intrinsically driven by increasing pleasure and decreasing pain.

5 - Truth testing always collapses to consequentialism since as humans we always evaluate the consequences of actions. (if i asked you would it be a good idea to wear a pink shirt to school tomorrow, you would think about how you or other might react to it)

6 - Only consequentialism explains a degree of wrongness

7 - Probability only util explains probability - if something happens 100 times we can determine it will happen again.

3

Starlink Mega-Constellations generates next-level advanced Weather Forecasting.

Erwin 20 Sandra Erwin 10-14-2020 "SpaceX to explore ways to provide weather data to U.S. military"

https://spacenews.com/spacex-to-explore-ways-to-provide-weather-data-to-u-s-military/ (Sandra Erwin writes about military space programs, policy, technology and the industry that supports this sector. She has covered the military, the Pentagon, Congress and the defense industry for nearly two decades as editor of NDIA's National Defense Magazine and Pentagon correspondent for Real Clear Defense.)//Elmer

The $2 million contract is to "assess the feasibility and long term viability of a 'weather data as a service business model." WASHINGTON — **SpaceX is looking at ways it could provide weather data** to the U.S. military. The company is working under a $2 million six-month study contract from the U.S. Space Force's Space and Missile Systems Center. Charlotte Gerhart, chief of the Space and Missile Systems Center Production Corps Low Earth Orbit Division, said in a statement to SpaceNews that SpaceX received the contract in July from SMC's Space Enterprise Consortium. The contract is to "assess the feasibility and long term viability of a 'weather data as a service business model,'" said Gerhart. SpaceX did not respond to questions from SpaceNews on how the company would leverage the Starlink internet constellation to provide weather data. The contract awarded to SpaceX is part of a Space Force program called Electro Optical/Infrared Weather System (EO/IR EWS). The consortium in June awarded $309 million in contracts to Raytheon Technologies, General Atomics Electromagnetic Systems, and Atmospheric & Space Technology Research Associates to develop weather satellite prototypes and payloads. SpaceX won the portion of the EO/IR EWS program that is looking at how weather data could be purchased as a service from a commercial company. "The EWS program **goal remains to provide** a more **resilient and higher refresh capability, enhancing global terrestrial weather capability**," said Gerhart. The SpEC consortium was created in 2017 to attract commercial space businesses to work with the military. The contracts awarded by SpEC are known as "other transaction authority" deals that are used for research projects and prototyping. The consortium on Oct. 8 informed its members that SpaceX had won the weather study contract. "The Air Force is pursuing a space-based environmental monitoring EO/IR system in a multi phased approach," the SpEC said in an email to members. The EO/IR EWS program is **looking at a future proliferated l**ow-**E**arth **o**rbit **constellation to focus on cloud characterization and theater weather imagery** that could be **supplemented by commercial services**. SpaceX's contract is for the "weather data as a service system architecture exploration phase," said SpEC. Industry sources speculated that **SpaceX could provide weather data collected by sensors hosted on its own Starlink satellites, or it could team with a weather data** services **company and use Starlink to distribute the data** to customers. One executive noted that both the U.S. military and the National Oceanic and Atmospheric Administration have **growing demands for data** that can be **provided at relatively low cost from companies that operate proliferated LEO systems.**

Advanced Weather Forecasting solves Climate Change.

Taylor-Smith 21 Kerry Taylor-Smith 3-25-2021 "What Role can Advanced Weather Forecasting have in Providing Climate Crisis Solutions?" https://www.azocleantech.com/article.aspx?ArticleID=1193 (Pursuing a passion for science, Kerry completed a degree in Natural Sciences at the University of Bath; where she studied a range of topics, including chemistry, biology, and environmental sciences. Her passion for writing grew as she worked on the university newspaper as a contributor, feature editor, and editor.)//Elmer

Humankind is in the midst of a climate crisis, battling to prevent global temperatures from rising while also keeping up with the energy demands of a growing population. Weather-related disasters cost billions of dollars each year, but it is not just the financial cost that should be considered – there is the loss of life, homes, wildlife, and infrastructure. There are **several ways weather monitoring can help solve** the climate crisis, **from lowing** transportation **emissions to pinpointing extreme weather events** such as wildfires and extraordinary variations in temperature. Tackling Emissions **Global travel and shipping contribute significantly to global warming**. Aircraft, ships, cars – nearly all modes of transportation emit harmful greenhouse gases, notably carbon dioxide, but also nitrous and sulfur oxides as well as particulates. **These greenhouse gases trap heat in the Earth's atmosphere, causing an overall warming effect and a negative impact on our climate**. Aviation accounts for 2.4% of all anthropogenic carbon dioxide emissions, with international flights in 2019 producing 915 million tons of the gas. **Weather forecasting** technology **providing** accurate, **real-time data** on meteorological conditions **can help airlines adjust routes to avoid headwinds or take advantage of favorable winds**, both of **which can** help **reduce fuel consumption and emissions**. Shipping is one of the most fuel-efficient means of transport, but also one of the most polluting, contributing 3% of all greenhouse gas emissions - a figure expected to almost double by 2050. "Burning bunker fuel accounts for almost 90% of global sulfur emissions and the 15 largest ships in the world produce more sulfur each year than all cars put together," states Renny Vandewege, Vice President of Weather Operations at DTN, a company providing decision support tools and forecast insights across many sectors. Shipping discharges a large and growing source of noxious gas but the sector has the potential to drastically cut emissions through **fuel-saving techniques**. Among the most promising is **weather routing**. "Using weather information and analytics can help mitigate risks today caused by climate change and can also reduce emissions further reducing future impacts", explains Vandewege, a former director of the Broadcast Meteorology Program at Mississippi State University. Weather **analytics can optimize routes** and "**reduce emissions up to 4% and** reduce **fuel consumption up to 10%**, depending on the type of vessel, the season, and the conditions," states Vandewege. "If there's bad weather ahead, sophisticated algorithms that use information about the ship and its capabilities and the weather effects on that specific ship can make numerous calculations and provide optimal route alternatives for the mariner." Extreme Weather Events Advanced weather forecasting alerts us to the probability of extreme meteorological events occurring. While these events are largely unpredictable, accurate meteorological data can identify hotspots where they are likely to occur. The better the data, the better prepared the general public and authorities can be. Wildfires have ravaged the US state of California and huge swathes of land in Australia. Climate change is responsible for the increasing intensity and occurrence of blazes, not just here, but worldwide. It has created the optimal conditions for wildfires to start, including warmer weather, less precipitation, dryer vegetation, and stronger winds. Advanced weather forecasting, such as DTN's live Geographic Information System (GIS) can monitor atmospheric conditions to evaluate wildfire risk and predict areas where conditions are just right for a wildfire to ignite. "Fire weather forecasting uses atmospheric conditions to evaluate wildfire risk," explains Vendewege. "Meteorologists can also use their tools and experience to identify the specific location of wildfires. Sophisticated imaging systems can show fire locations in real time, allowing for a live look at the conditions using a GIS layer service containing the latest fire hotspot data and also showing the likelihood of a fire." Machine learning, a means of artificial intelligence, can also be used in

conjunction with current forecasting methods to predicts heat waves or cold snaps. These extreme weather events are the result of unusual atmospheric patterns that researchers from Rice University realized could be taught to a pattern recognition program. The technology, designed to work with current analog forecasting systems rather than replace them, could predict events with 80% accuracy, five days before the event occurred. Although only proof-of-concept, the technology could provide an early warning about when and where an extreme weather event might occur. Conclusion Humans are heavily reliant on the weather; it has a role in every aspect of our lives, from feeding us to providing power for our ever-growing needs. Climate change has warmed the planet and altered our weather, making extreme weather events such as droughts and floods more likely. **High-tech weather forecasting technology can help** in the fight against climate change by monitoring meteorological conditions to **aid decision making**, whether that be in the aviation or shipping industry, **or** by helping us **understand** and predict **natural hazards and disasters,** allowing us to reduce the risk of adverse events – and the costs, environmental, economic or otherwise.

Warming causes extinction, we have a short window for action before point of no return

Krosofsky '21 [Andrew, Green Matters Journalist, "How Global Warming May Eventually Lead to Global Extinction", Green Matters, 03-11-2021, https://www.greenmatters.com/p/will-global-warming-cause-extinction]//pranav

Eventually, yes. **Global warming will invariably result in the mass extinction of millions of different species,** humankind included. In fact, **the Center for Biological Diversity says that global warming is currently the greatest threat to life on this planet**. **Global warming causes a number of detrimental effects on the environment that many species won't be able to handle long-term**. Extreme weather patterns are shifting climates across the globe, eliminating habitats and altering the landscape. **As a result, food and fresh water sources are being drastically reduced**. Then, of course, **there are the rising global temperatures themselves, which many species are physically unable to contend with**. Formerly frozen arctic and antarctic regions are melting, increasing sea levels and temperatures. Eventually, **these effects will create a perfect storm of extinction conditions**. The melting glaciers of the arctic and the searing, **unmanageable heat indexes being seen along the Equator are just the tip of the iceberg, so to speak. The species that live in these climate zones have already been affected by the changes caused by global warming.** Take polar bears for example, whose habitats and food sources have been so greatly diminished that they have been forced to range further and further south. **Increased carbon dioxide levels in the atmosphere and oceans have already led to ocean acidification**. **This has caused many species of crustaceans to either adapt or perish and has led to the mass bleaching of more than 50 percent of Australia's Great Barrier Reef**, according to National Geographic. According to the Center for Biological Diversity, the current trajectory of global warming predicts that more than 30 percent of Earth's plant and animal species will face extinction by 2050. By the end of the century, that number could be as high as 70 percent. We won't try and sugarcoat things, humanity's own prospects aren't looking that great either. According to The Conversation, **our species has just under a decade left to get our CO_2 emissions under control. If we don't cut those emissions by half before 2030, temperatures will rise to potentially catastrophic levels. It may only seem like a degree or so, but the worldwide ramifications are immense.** The human species is resilient. We will survive for a while longer, even if these grim global warming predictions come to pass, **but it will mean less food, less water, and increased hardship across the world — especially in low-income areas and developing countries. This increase will also mean more pandemics, devastating storms, and uncontrollable wildfires.**

4 - Agriculture (1:20)

Constellations 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.

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 São 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 Population 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

usly available.

Case

AT: Framing

Ethical side constraint - we can’t pursue virtue if we constantly fear death.
If i my family will be killed unless i steal, i'm going to steal
Virtue is infinitely regressive, we never know what is good and what is not it becomes inherently subjective

AT: Offense:

A] Tech innovation is inevitable, if not in space then on earth, someone is always doing something and your kritik doesn't do anything

B] Commodifying nature is inevitable we're capitalist

Space colonization can only be achieved by the public-sector – rhetoric doesn't matter if its impossible

Phillips 20 [(Leigh, science writer and EU affairs journalist, author of Austerity Ecology & the Collapse-Porn Addicts.) "We Don't Need Elon Musk to Explore the Solar System," May 8, 2021, https://jacobinmag.com/2021/05/elon-musk-space-exploration-mars-colonization] TDI

Elon Musk is right to dream of humanity's future as a multi-planet species. However, the multigenerational, millennia-long project of space colonization will be a public-sector endeavor, or it will not happen. Elon Musk, the third-richest man in the world, CEO of SpaceX and Tesla (and dabbler in online edgelord provocation), issued a strange Twitter post last month in defense of his wealth. "I am accumulating resources to help make life multiplanetary & extend the light of consciousness to the stars," he declared. And then, this week, the centibillionaire further provoked when he mentioned in an interview about Martian colonization that, while it would be a glorious experience, "a bunch of people will probably die in the beginning." All this within days of NASA's Perseverance Mars mission achieving the first helicopter flight on another planet and producing five grams of oxygen from the planet's carbon dioxide–dominant atmosphere — two major milestones in space exploration. A reasonable critique of Musk's SpaceX endeavors might begin by noting that, regardless of how noble an aim Musk may have for his centibillions, there simply should not be centibillionaires (or even regular millionaires and billionaires). One might also echo Neil Armstrong's criticism of private space flight — a criticism that once made Elon cry when 60 Minutes asked him about his hero arguing against the privatization of space. We might note how space exploration during the Cold War, despite the militarist overtones of the Space Race, was explicitly intended to be for all mankind rather than in service of the jollies of ultrarich space tourists. A democratic and public redirection of Elon Musk's billions might be spent differently. One might further assert that, given the non-identity of the set of all things that are beneficial and the set of all things that are profitable, **space colonization will be a public-sector endeavor, or it will not happen — as such a private space travel has no near-term, medium-term, or even long-term prospect of any return on financial investment beyond servicing low-earth, medium-earth, or geostationary orbit**

The 1NC Never says that space col is good or will happen

Private entities can't undergo space col anyways so no impact to your offense

(Tyson 12) Neil deGrasse Tyson, *"Neil deGrasse Tyson: Bringing Commercial Space Fantasies Back to Earth,"* BigThink, 2012, **https://bigthink.com/videos/neil-degrasse-tyson-bringing-commercial-space-fantasies-back-to-earth/ //** AKRG

Tyson went on to earn his BA in Physics from Harvard and his PhD in Astrophysics from Columbia. He is the first occupant of the Frederick P. Rose Directorship of the Hayden Planetarium. His professional research interests are broad, but include star formation, exploding stars, dwarf galaxies, and the structure of our Milky Way. Tyson obtains his data from the Hubble Space Telescope, as well as from telescopes in California, New Mexico, Arizona, and in the Andes Mountains of Chile. Tyson is the recipient of nine honorary doctorates and the NASA Distinguished Public Service Medal. His contributions to the public appreciation of the cosmos have been recognized by the International Astronomical Union in their official naming of asteroid "13123 Tyson". Tyson's book is Letters From an Astrophysicist (2019). https://bigthink.com/people/neildegrassetyson/

Neil deGrasse Tyson: **There is a lot of talk lately about what role the privatization of space might play in our future ambitions of space exploration, and from where I sit there is a lot of**

delusional thinking there. For example, unlike what Newt Gingrich said in a presidential debate—there he is saying had we given the money we had given to NASA to the private sector we would have been on the moon and Mars by now and we would have done it more cheaply and everything would be fine and dandy. . . . No, it doesn't work that way. **Private enterprise in the history of civilization has never led large, expensive, dangerous projects with unknown risks. That has never happened because when you combine all these factors you cannot create a capital market valuation of that activity. The first Europeans to the new world were not sailors on the Dutch East India Trading Company ships. It was Columbus. It was Magellan. And these were voyages funded by governments. Somebody has to draw the maps. Somebody has to see where the danger spots are, where it's safe, what the prevailing winds are.** Once that is established, then private enterprise can come in and say, "Here's the risk, I need an investor, here's your payback, we can turn this into an enterprise." **So no, private enterprise is not going to lead us to the moon. They're not going to lead us to Mars.** What would be nice for them to do is take on our low earth orbit activities. Been there, done that. **Back in the 60s low earth orbit was a frontier. We didn't know, well, can a human survive? Can you even swallow if you're in orbit? Would saliva get caught in your throat? Simple questions like that were unknown and unanswered at the time. We're well past that.** We know how to get to low earth orbit. **It's done.** The patents are offered—are given, granted—and so that would be the ideal place for private enterprise to take over. Tourism would easily drive that. Look how much money Americans in the world spend on tourism. You could have tourist lotteries where you could win a much more expensive vacation than you could otherwise afford, and I'd certainly buy lottery tickets if it meant taking a vacation in space, or rather in orbit around earth—which I guess we'll still call that space, but if NASA is advancing a space frontier that's kind of really just driving around the block at that point, but that could surely sell tickets, and I'd be first in line.

B] Going to space is inevitable if states go its not any different no reason to reject the neg