# 1NC vs Bronx Science

### 1NC

#### Our interpretation is that the resolution should define the division of affirmative and negative ground and offense. It was *negotiated* and *announced in advance*, providing both sides with a reasonable opportunity to prepare to engage one another’s arguments.

#### ‘Resolved’ preceding a colon indicates a legislative forum.

Blanche Ellsworth 81, English professor at SFSU and M.A. in English from UC Berkeley, 1/1/1981, *English Simplified*, 4th Edition, cc

A colon is also used to separate 3. THE SALUTATION OF A BUSINESS LETTER FROM THE BODY, Dear Sir Dear Ms. Weiner NOTE: In an informal letter, a comma follows the salutation: Dear Mary, Dear Uncle Jack 4. PARTS OF TITLES, REFERENCES, AND NUMERALS. TITLE: Principles of Mathematics: An Introduction REFERENCE: Luke 3:4—13 NUMERALS: 8:15 PM 5. PLACE OF PUBLICATION FROM PUBLISHER Indianapolis: Bobbs-Merrill 6. THE WORD RESOLVED FROM THE STATEMENT OF THE RESOLUTION. Resolved: That this committee go on record as favoring new legislation.

#### Ought means should

Merriam Webster, No Date – Merriam Webster’s Learner’s Dictionary, “ought”, <http://www.learnersdictionary.com/definition/ought>  
ought /ˈɑːt/ verb  
Learner's definition of OUGHT [modal verb] 1 ◊ Ought is almost always followed by to and the infinitive form of a verb. The phrase ought to has the same meaning as should and is used in the same ways, but it is less common and somewhat more formal. The negative forms ought not and oughtn't are often used without a following to. — used to indicate what is expected They ought to be here by now. You ought to be able to read this book. There ought to be a gas station on the way. 2 — used to say or suggest what should be done You ought to get some rest. That leak ought to be fixed. You ought to do your homework.

#### Should requires legal effect

Summers 94 (Justice – Oklahoma Supreme Court, “Kelsey v. Dollarsaver Food Warehouse of Durant”, 1994 OK 123, 11-8, http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn13)

¶4 The legal question to be resolved by the court is whether the word "should"[13](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn13) in the May 18 order connotes futurity or may be deemed a ruling *in praesenti*.[14](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn14) The answer to this query is not to be divined from rules of grammar;[15](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn15) it must be governed by the age-old practice culture of legal professionals and its immemorial language usage. To determine if the omission (from the critical May 18 entry) of the turgid phrase, "and the same hereby is", (1) makes it an in futuro ruling - i.e., an expression of what the judge will or would do at a later stage - or (2) constitutes an in in praesenti resolution of a disputed law issue, the trial judge's intent must be garnered from the four corners of the entire record. [CONTINUES – TO FOOTNOTE] [13](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker2fn13) "*Should*" not only is used as a "present indicative" synonymous with *ought* but also is the past tense of "shall" with various shades of meaning not always easy to analyze. See 57 C.J. Shall § 9, Judgments § 121 (1932). O. JESPERSEN, GROWTH AND STRUCTURE OF THE ENGLISH LANGUAGE (1984); St. Louis & S.F.R. Co. v. Brown, 45 Okl. 143, 144 P. 1075, 1080-81 (1914). For a more detailed explanation, see the Partridge quotation infra note 15. Certain contexts mandate a construction of the term "should" as more than merely indicating preference or desirability. Brown, supra at 1080-81 (jury instructions stating that jurors "should" reduce the amount of damages in proportion to the amount of contributory negligence of the plaintiff was held to imply an *obligation* *and to be more than advisory*); Carrigan v. California Horse Racing Board, 60 Wash. App. 79, [802 P.2d 813](http://www.oscn.net/applications/oscn/deliverdocument.asp?box1=802&box2=P.2D&box3=813) (1990) (one of the Rules of Appellate Procedure requiring that a party "should devote a section of the brief to the request for the fee or expenses" was interpreted to mean that a party is under an *obligation* to include the requested segment); State v. Rack, 318 S.W.2d 211, 215 (Mo. 1958) ("should" would mean the same as "shall" or "must" when used in an instruction to the jury which tells the triers they "should disregard false testimony"). [14](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker2fn14) *In praesenti* means literally "at the present time." BLACK'S LAW DICTIONARY 792 (6th Ed. 1990). In legal parlance the phrase denotes that which in law is *presently* or *immediately effective*, as opposed to something that *will* or *would* become effective *in the future [in futurol*]. See Van Wyck v. Knevals, [106 U.S. 360](http://www.oscn.net/applications/oscn/deliverdocument.asp?box1=106&box2=U.S.&box3=360), 365, 1 S.Ct. 336, 337, 27 L.Ed. 201 (1882).

#### “Appropriation of outer space” by private entities refers to the exercise of exclusive control of space.

TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ’13, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217 [\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were trying to accomplish, albeit through different means.219

#### Outer Space is considered anything that sits above the Earth’s atmosphere

Betz 21 [(Eric Betz, Science & tech writer for @Discovermag, @Astronomymag and others), “The Kármán Line: Where does space begin?”, Astronomy, https://astronomy.com/news/2021/03/the-krmn-line-where-does-space-begin, March 5, 2021] SS

These days, spacecraft are venturing into the final frontier at a record pace. And a deluge of paying space tourists should soon follow. But to earn their astronaut wings, high-flying civilians will have to make it past the so-called Kármán line. This boundary sits some 62 miles (100 kilometers) above Earth's surface, and it's generally accepted as the place where Earth ends and outer space begins.

#### Private entities are non-governmental corporations

UpCounsel ND [(UpCounsel is an interactive online service that makes it faster and easier for businesses to find and hire legal help solely based on their preferences. “Private Entity: Everything You Need to Know”, UpCounsel, https://www.upcounsel.com/private-entity#importance-of-private-entities, No Date] SS

A private entity can be a partnership, corporation, individual, nonprofit organization, company, or any other organized group that is not government-affiliated. Indian tribes and foreign public entities are not considered private entities.

Unlike publicly traded companies, private companies do not have public stock offerings on Nasdaq, American Stock Exchange, or the New York Stock Exchange. Instead, they offer shares privately to interested investors, who may trade among themselves.

#### Unjust means unfair or characterized by injustice

Merriam Webster ND [(Merriam-Webster, Merriam-Webster, Inc. is an American company that publishes reference books and is especially known for its dictionaries.),“unjust”, https://www.merriam-webster.com/dictionary/unjust, No Date] SS

Definition of unjust

1: characterized by injustice : UNFAIR

#### It is irrelevant if they are correct about everything that they said – allowing the aff to deviate from the resolution is a moral hazard, it justifies an infinite number of unpredictable arguments with thin ties to the resolution

#### This undermines deliberation – turns the aff because they will never be competent advocates for their position unless they have experience against a well-prepared opponent

#### A clear, well-defined resolution is critical to allow the neg to refute the aff in an in-depth fashion – this process of negation produces iterative testing and improvement, where we learn to improve our arguments based on our opponents’ arguments. This process does not proscribe particular styles or forms of argument but does require a common point of disagreement around which arguments can be organized

Ralf Poscher 16, director of the Institute for Staatswissenschaft & Philosophy of Law, Professor of Public Law and Legal Philosophy, “Why We Argue About the Law: An Agonistic Account of Legal Disagreement,” in *Metaphilosophy of Law*, ed. Gizbert-Studnicki, Dyrda, Banas, 2/19/16, SSRN

Hegel’s dialectical thinking powerfully exploits the idea of negation. It is a central feature of spirit and consciousness that they have the power to negate. The spirit “is this power only by looking the negative in the face and tarrying with it. This […] is the magical power that converts it into being.”102 The tarrying with the negative is part of what Hegel calls the “labour of the negative”103. In a loose reference to this Hegelian notion Gerald Postema points to yet another feature of disagreements as a necessary ingredient of the process of practical reasoning. Only if our reasoning is exposed to contrary arguments can we test its merits. We must go through the “labor of the negative” to have trust in our deliberative processes.104

This also holds where we seem to be in agreement. Agreement without exposure to disagreement can be deceptive in various ways. The first phenomenon Postema draws attention to is the group polarization effect. When a group of like‐minded people deliberates an issue, informational and reputational cascades produce more extreme views in the process of their deliberations.105 The polarization and biases that are well documented for such groups 106 can be countered at least in some settings by the inclusion of dissenting voices. In these scenarios, disagreement can be a cure for dysfunctional deliberative polarization and biases.107 A second deliberative dysfunction mitigated by disagreement is superficial agreement, which can even be manipulatively used in the sense of a “presumptuous ‘We’”108. Disagreement can help to police such distortions of deliberative processes by challenging superficial agreements. Disagreements may thus signal that a deliberative process is not contaminated with dysfunctional agreements stemming from polarization or superficiality. Protecting our discourse against such contaminations is valuable even if we do not come to terms. Each of the opposing positions will profit from the catharsis it received “by looking the negative in the face and tarrying with it”.

These advantages of disagreement in collective deliberations are mirrored on the individual level. Even if the probability of reaching a consensus with our opponents is very low from the beginning, as might be the case in deeply entrenched conflicts, entering into an exchange of arguments can still serve to test and improve our position. We have to do the “labor of the negative” for ourselves. Even if we cannot come up with a line of argument that coheres well with everybody else’s beliefs, attitudes and dispositions, we can still come up with a line of argument that achieves this goal for our own personal beliefs, attitudes and dispositions. To provide ourselves with the most coherent system of our own beliefs, attitudes and dispositions is – at least in important issues – an aspect of personal integrity – to borrow one of Dworkin’s favorite expressions for a less aspirational idea.

In hard cases we must – in some way – lay out the argument for ourselves to figure out what we believe to be the right answer. We might not know what we believe ourselves in questions of abortion, the death penalty, torture, and stem cell research, until we have developed a line of argument against the background of our subjective beliefs, attitudes and dispositions. In these cases it might be rational to discuss the issue with someone unlikely to share some of our more fundamental convictions or who opposes the view towards which we lean. This might even be the most helpful way of corroborating a view, because we know that our adversary is much more motivated to find a potential flaw in our argument than someone with whom we know we are in agreement. It might be more helpful to discuss a liberal position with Scalia than with Breyer if we want to make sure that we have not overlooked some counter‐argument to our case.

It would be too narrow an understanding of our practice of legal disagreement and argumentation if we restricted its purpose to persuading an adversary in the case at hand and inferred from this narrow understanding the irrationality of argumentation in hard cases, in which we know beforehand that we will not be able to persuade. Rational argumentation is a much more complex practice in a more complex social framework. Argumentation with an adversary can have purposes beyond persuading him: to test one’s own convictions, to engage our opponent in inferential commitments and to persuade third parties are only some of these; to rally our troops or express our convictions might be others. To make our peace with Kant we could say that “there must be a hope of coming to terms” with someone though not necessarily with our opponent, but maybe only a third party or even just ourselves and not necessarily only on the issue at hand, but maybe through inferential commitments in a different arena.

f) The Advantage Over Non‐Argumentative Alternatives

It goes without saying that in real world legal disagreements, all of the reasons listed above usually play in concert and will typically hold true to different degrees relative to different participants in the debate: There will be some participants for whom our hope of coming to terms might still be justified and others for whom only some of the other reasons hold and some for whom it is a mixture of all of the reasons in shifting degrees as our disagreements evolve. It is also apparent that, with the exception of the first reason, the rationality of our disagreements is of a secondary nature. The rational does not lie in the discovery of a single right answer to the topic of debate, since in hard cases there are no single right answers. Instead, our disagreements are instrumental to rationales which lie beyond the topic at hand, like the exploration of our communalities or of our inferential commitments. Since these reasons are of this secondary nature, they must stand up to alternative ways of settling irreconcilable disagreements that have other secondary reasons in their favor – like swiftness of decision making or using fewer resources. Why does our legal practice require lengthy arguments and discursive efforts even in appellate or supreme court cases of irreconcilable legal disagreements? The closure has to come by some non‐argumentative mean and courts have always relied on them. For the medieval courts of the Germanic tradition it is bequeathed that judges had to fight it out literally if they disagreed on a question of law – though the king allowed them to pick surrogate fighters.109 It is understandable that the process of civilization has led us to non‐violent non‐ argumentative means to determine the law. But what was wrong with District Judge Currin of Umatilla County in Oregon, who – in his late days – decided inconclusive traffic violations by publicly flipping a coin?110 If we are counting heads at the end of our lengthy argumentative proceedings anyway, why not decide hard cases by gut voting at the outset and spare everybody the cost of developing elaborate arguments on questions, where there is not fact of the matter to be discovered?

One reason lies in the mixed nature of our reasons in actual legal disagreements. The different second order reasons can be held apart analytically, but not in real life cases. The hope of coming to terms will often play a role at least for some time relative to some participants in the debate. A second reason is that the objectives listed above could not be achieved by a non‐argumentative procedure. Flipping a coin, throwing dice or taking a gut vote would not help us to explore our communalities or our inferential commitments nor help to scrutinize the positions in play. A third reason is the overall rational aspiration of the law that Dworkin relates to in his integrity account111. In a justificatory sense112 the law aspires to give a coherent account of itself – even if it is not the only right one – required by equal respect under conditions of normative disagreement.113 Combining legal argumentation with the non‐argumentative decision‐ making procedure of counting reasoned opinions serves the coherence aspiration of the law in at least two ways: First, the labor of the negative reduces the chances that constructions of the law that have major flaws or inconsistencies built into the arguments supporting them will prevail. Second, since every position must be a reasoned one within the given framework of the law, it must be one that somehow fits into the overall structure of the law along coherent lines. It thus protects against incoherent “checkerboard” treatments114 of hard cases. It is the combination of reasoned disagreement and the non‐rational decision‐making mechanism of counting reasoned opinions that provides for both in hard cases: a decision and one – of multiple possible – coherent constructions of the law. Pure non‐rational procedures – like flipping a coin – would only provide for the decision part. Pure argumentative procedures – which are not geared towards a decision procedure – would undercut the incentive structure of our agonistic disagreements.115 In the face of unresolvable disagreements endless debates would seem an idle enterprise. That the debates are about winning or losing helps to keep the participants engaged. That the decision depends on counting reasoned opinions guarantees that the engagement focuses on rational argumentation. No plain non‐argumentative procedure would achieve this result. If the judges were to flip a coin at the end of the trial in hard cases, there would be little incentive to engage in an exchange of arguments. It is specifically the count of reasoned opinions which provides for rational scrutiny in our legal disagreements and thus contributes to the rationales discussed above.

2. The Semantics of Agonistic Disagreements

The agonistic account does not presuppose a fact of the matter, it is not accompanied by an ontological commitment, and the question of how the fact of the matter could be known to us is not even raised. Thus the agonistic account of legal disagreement is not confronted with the metaphysical or epistemological questions that plague one‐right‐answer theories in particular. However, it must still come up with a semantics that explains in what sense we disagree about the same issue and are not just talking at cross purposes.

In a series of articles David Plunkett and Tim Sundell have reconstructed legal disagreements in semantic terms as metalinguistic negotiations on the usage of a term that at the center of a hard case like “cruel and unusual punishment” in a death‐penalty case.116 Even though the different sides in the debate define the term differently, they are not talking past each other, since they are engaged in a metalinguistic negotiation on the use of the same term. The metalinguistic negotiation on the use of the term serves as a semantic anchor for a disagreement on the substantive issues connected with the term because of its functional role in the law. The “cruel and unusual punishment”‐clause thus serves to argue about the permissibility of the death penalty. This account, however only provides a very superficial semantic commonality. But the commonality between the participants of a legal disagreement go deeper than a discussion whether the term “bank” should in future only to be used for financial institutions, which fulfills every criteria for semantic negotiations that Plunkett and Sundell propose. Unlike in mere semantic negotiations, like the on the disambiguation of the term “bank”, there is also some kind of identity of the substantive issues at stake in legal disagreements.

A promising route to capture this aspect of legal disagreements might be offered by recent semantic approaches that try to accommodate the externalist challenges of realist semantics,117 which inspire one‐right‐answer theorists like Moore or David Brink. Neo‐ descriptivist and two‐valued semantics provide for the theoretical or interpretive element of realist semantics without having to commit to the ontological positions of traditional externalism. In a sense they offer externalist semantics with no ontological strings attached.

The less controversial aspect of the externalist picture of meaning developed in neo‐ descriptivist and two‐valued semantics can be found in the deferential structure that our meaning‐providing intentions often encompass.118 In the case of natural kinds, speakers defer to the expertise of chemists when they employ natural kind terms like gold or water. If a speaker orders someone to buy $ 10,000 worth of gold as a safe investment, he might not know the exact atomic structure of the chemical element 79. In cases of doubt, though, he would insist that he meant to buy only stuff that chemical experts – or the markets for that matter – qualify as gold. The deferential element in the speaker’s intentions provides for the specific externalist element of the semantics.

In the case of the law, the meaning‐providing intentions connected to the provisions of the law can be understood to defer in a similar manner to the best overall theory or interpretation of the legal materials. Against the background of such a semantic framework the conceptual unity of a linguistic practice is not ratified by the existence of a single best answer, but by the unity of the interpretive effort that extends to legal materials and legal practices that have sufficient overlap119 – be it only in a historical perspective120. The fulcrum of disagreement that Dworkin sees in the existence of a single right answer121 does not lie in its existence, but in the communality of the effort – if only on the basis of an overlapping common ground of legal materials, accepted practices, experiences and dispositions. As two athletes are engaged in the same contest when they follow the same rules, share the same concept of winning and losing and act in the same context, but follow very different styles of e.g. wrestling, boxing, swimming etc. They are in the same contest, even if there is no single best style in which to wrestle, box or swim. Each, however, is engaged in developing the best style to win against their opponent, just as two lawyers try to develop the best argument to convince a bench of judges.122 Within such a semantic framework even people with radically opposing views about the application of an expression can still share a concept, in that they are engaged in the same process of theorizing over roughly the same legal materials and practices. Semantic frameworks along these lines allow for adamant disagreements without abandoning the idea that people are talking about the same concept. An agonistic account of legal disagreement can build on such a semantic framework, which can explain in what sense lawyers, judges and scholars engaged in agonistic disagreements are not talking past each other. They are engaged in developing the best interpretation of roughly the same legal materials, albeit against the background of diverging beliefs, attitudes and dispositions that lead them to divergent conclusions in hard cases. Despite the divergent conclusions, semantic unity is provided by the largely overlapping legal materials that form the basis for their disagreement. Such a semantic collapses only when we lack a sufficient overlap in the materials. To use an example of Michael Moore’s: If we wanted to debate whether a certain work of art was “just”, we share neither paradigms nor a tradition of applying the concept of justice to art such as to engage in an intelligible controversy.

#### These skills are tremendously valuable for movement building and challenging injustice but require engagement with a well-prepared opponent

Talisse 5 – Professor of Philosophy @ Vandy (Robert, Philosophy & Social Criticism, “Deliberativist responses to activist challenges,” 31(4) p. 429-431)

The argument thus far might appear to turn exclusively upon different conceptions of what reasonableness entails. The deliberativist view I have sketched holds that reasonableness involves some degree of what we may call epistemic modesty. On this view, the reasonable citizen seeks to have her beliefs reﬂect the best available reasons, and so she enters into public discourse as a way of testing her views against the objections and questions of those who disagree; hence she implicitly holds that her present view is open to reasonable critique and that others who hold opposing views may be able to offer justiﬁcations for their views that are at least as strong as her reasons for her own. Thus any mode of politics that presumes that discourse is extraneous to questions of justice and justiﬁcation is unreasonable. The activist sees no reason to accept this. Reasonableness for the activist consists in the ability to act on reasons that upon due reﬂection seem adequate to underwrite action; discussion with those who disagree need not be involved. According to the activist, there are certain cases in which he does in fact know the truth about what justice requires and in which there is no room for reasoned objection. Under such conditions, the deliberativist’s demand for discussion can only obstruct justice; it is therefore irrational. It may seem that we have reached an impasse. However, there is a further line of criticism that the activist must face. To the activist’s view that at least in certain situations he may reasonably decline to engage with persons he disagrees with (107), the deliberative democrat can raise the phenomenon that Cass Sunstein has called ‘group polarization’ (Sunstein, 2003; 2001a: ch. 3; 2001b: ch. 1). To explain: consider that political activists cannot eschew deliberation altogether; they often engage in rallies, demonstrations, teach-ins, workshops, and other activities in which they are called to make public the case for their views. Activists also must engage in deliberation among themselves when deciding strategy. Political movements must be organized with whom one disagrees is essential to the proper pursuit of justice. Insofar as the activist denies this, he is unreasonable.

#### Prefer our impact:

#### Skepticism – presume all their truth claims false because they have not been properly tested

#### Scope – the role of individual debate rounds on broader subject formation is white noise – *can you remember what happened round () of () your junior year?* – individual rounds don’t affect our subjectivity, but a model of debate that forefronts clash and rigorous negation can turn us into more competent advocates

#### Deliberative processes like debate rarely change latent preferences, but they can make us less vulnerable to political manipulation – that means our framework doesn’t create neocons but makes us better equipped to resist them

Simon Niemeyer - Centre for Deliberative Global Governance, The Australian National University - 2011,

The Emancipatory Effect of Deliberation: Empirical Lessons from Mini-Publics, Politics & Society, 39(1) 103–140, SAGE Publications

The results of the two case studies in this article suggest that deliberation does not fundamentally change individuals or inculcate a sense of moral duty. The particular values that prevailed in both issues were always present (and measurable), even if they were latent in expressed preferences. Before deliberation, most participants believed they were acting in the public interest,69 but good intentions alone are not sufficient to formulate civic-minded preferences. Predeliberative preferences were more strongly influenced by discourses associated with symbolic politics. Following deliberation, symbolic cues reduced the “cost” of arriving at a decision,70 but the cognitive shortcut resulted in positions that did not properly reflect participants’ overall subjectivity. Before deliberation, symbolic politics—or at least the mere presence of potent symbols—distorted participants’ preferences. This process may be manipulative and overt, as in the case of the Bloomfield Track, or incidental, as in the case of the Fremantle Bridge. Deliberation successfully corrected the influence of symbolic politics because it provided both the incentive and the means to develop positions on an intersubjective set of recognized issues that extended beyond the narrow set of unhelpful symbolic ones. The mechanism whereby this occurred did not so much involve changing incentive structures, as predicted by institutional rational choice.71 Rather, it changed the decision pathway from a casual understanding of emotionally appealing content to a deeper understanding that allowed participants to better express their own subjectivity. The change was as much a function of stripping away the impact of symbolic arguments as it was due to participants’ increased ability and willingness to deal with issue complexity.

## Case

#### Vote neg on presumption— no warrant for why this would cause any spill over into real world education of this issue or why you need the ballot to win.

### Framing

**ROB is to vote for the better debater – anything else is arbitrary, self–serving, and impact justified – they haven’t justified how debate shapes subject formation – it doesn’t – the role of individual debate rounds is white noise – *can you remember what happened round () of () your senior year?***

#### Utilitarianism is good— I feel pleasure and pain no reason to think otherwise for you, proves its not subjective

**Moral uncertainty means preventing extinction should be our highest priority.  
Bostrom 12** [Nick Bostrom. Faculty of Philosophy & Oxford Martin School University of Oxford. “Existential Risk Prevention as Global Priority.” Global Policy (2012)]  
These reflections on **moral uncertainty suggest** an alternative, complementary way of looking at existential risk; they also suggest a new way of thinking about the ideal of sustainability. Let me elaborate.¶ **Our present understanding of axiology might** well **be confused. We may not** nowknow — at least not in concrete detail — what outcomes would count as a big win for humanity; we might not even yet **be able to imagine the best ends** of our journey. **If we are** indeedprofoundly **uncertain** about our ultimate aims,then we should recognize that **there is a great** option **value in preserving** — and ideally improving — **our ability to recognize value and** to **steer the future accordingly. Ensuring** that **there will be a future** version of **humanity** with great powers and a propensity to use them wisely **is** plausibly **the best way** available to us **to increase the probability that the future will contain** a lot of **value.** To do this, we must prevent any existential catastrophe.

**Reducing the risk of extinction is always priority number one.   
Bostrom 12** [Faculty of Philosophy and Oxford Martin School, University of Oxford.], Existential Risk Prevention as Global Priority.  Forthcoming book (Global Policy). MP. http://www.existenti...org/concept.pdfEven if we use the most conservative of these estimates, which entirely ignores the   possibility of space colonization and software minds, **we find that the expected loss of an existential   catastrophe is greater than the value of 10^16 human lives**.  **This implies that the expected value of   reducing existential risk by a mere one millionth of one percentage point is at least a hundred times the   value of a million human lives.**  The more technologically comprehensive estimate of 10  54 humanbrain-emulation subjective life-years (or 10  52  lives of ordinary length) makes the same point even   more starkly.  Even if we give this allegedly lower bound on the cumulative output potential of a   technologically mature civilization a mere 1% chance of being correct, we find that the expected   value of reducing existential risk by a mere one billionth of one billionth of one percentage point is worth   a hundred billion times as much as a billion human lives. **One might consequently argue that even the tiniest reduction of existential risk has an   expected value greater than that of the definite provision of any ordinary good, such as the direct   benefit of saving 1 billion lives.**  And, further, that the absolute value of the indirect effect of saving 1  billion lives on the total cumulative amount of existential riskâ€”positive or negativeâ€”is almost   certainly larger than the positive value of the direct benefit of such an action.

### advantage

#### Technological thought is good rejection removes innovation that creates a litany of extinction scenarios

**Heaberlin, 4** – nuclear engineer, led the Nuclear Safety and Technology Applications Product Line at the Pacific Northwest National Laboratory (Scott, A Case for Nuclear-Generated Electricity, p. 31-40)

Well, then let's not do that, huh? Well, no, not hardly, because without that use of fertilizers we couldn't produce the food to feed the population. We just couldn't do it. Here are some comparisons." If you used no fertilizers or pesticides you could get 500 kilograms of grain from a hectare in a dry climate and as much as 1000 kilograms in a humid cli­mate. If you got organic and used animal manure as fertilizer, assuming you could find enough, you might get as much as 2000 kilograms per hectare. For a sense of scale, the average in the United States, where recall we only get half the food value to hectare as the intensively farmed Chinese crop land, we get about 4500 kilograms per hectare on the average. In serious cornfields with fertilizer, irrigation, and pesticides, the value is 7000 kilograms per hectare. Modern mechanized, chemically supported agriculture produces 7 to 14 times the food that you would get without those advantages. Even the best organic farming would produce only 30 to 45% of the food value you would get from the same sized chemically fertilized farm, and that is assuming you could get the manure you needed to make it work. In very stark terms, without the chemically enhanced farming we would have probably something like one-fifth the food supply we have now. That means four-fifths the population would not be fed, at least as we are organized now. So, no, just giving up on fertilizers is not in the deal. However, we could get the hydrogen and energy from sources other than natural gas. Nuclear energy could be used to provide electricity to extract hydrogen from water and produce the process heat required to combine the hydrogen and nitrogen from the air. That is just a thought to stick in your mind. While we are looking at energy use in agriculture, here are a few more numbers for you.10 If you look at the energy input into agriculture and the energy you get out, you see some interesting facts. By combining the energy used to make fertilizers and pesticides, power irrigation, and run the farm machinery in the United States, we use about 0.7 kcal of fossil fuel energy for each 1 kcal of food we make. This doesn't include the energy needed to process and transport the food. In Europe where they farm more intensely, the amount of energy out is just about the same as energy in. In Germany and Italy the numbers are 1.4 and 1.7 kcal energy input to each 1 kcal output respectively. The point is you need energy to feed people, well at least a lot of people. Which gets us back to Cohen and his question. One of the studies he examined looked at a "self-sustaining solar energy system." For the United States, this would replace all fossil energy and provide one-fifth to one-half the current energy use. The conclusion of the study was that this would either produce" a significant reduction in our standard of living ... even if all the energy conservation measures known today were adopted" or if set at the current standard of living, "then the ideal U.S. population should be targeted at 40-100 million people." The authors of that study then cheerfully go on to point out that we do have enough fossil fuel to last a least a century, as long as we can work out the pesky environmental problems. So, you can go to a "self-sustaining" energy economy as long as you are willing to shoot between 2 out of 3 and 6 out of 7 of your neighbors. And this is a real question. The massive use of fossil fuel driven agriculture to provide the fertilizers and pesticides, and power the farm equipment, is a) vitally important to feed everyone, and b) something we just can't keep up in a business-as-usual fashion. Sustainable means you can keep doing it. Fossil energy supplies are finite; you will run out some time. Massive use of fossil energy and the greenhouse gases they produce also may very well tip the planet into one of those extinction events in which a lot of very bad things happen to a lot of the life on the earth. O.K. to Cohen's big question, how many people can the earth support? What it comes down to is that the "Well, it depends" answer depends on • what quality of life you will accept, • what level of technology you will use, and • what level of social integration you will accept. We have seen some of the numbers regarding quality of life. Clearly if you are willing to accept the Bangladesh diet, you can feed 1.8 times more people than if you chose the United States diet. If you choose the back-to-nature, live like our hearty forefathers, level of technology, you can feed perhaps one-fifth as many people as you can with modern chemical fertilized agriculture. The rest have to go. And here is the tough one. You can do a lot better, get a lot more people on the planet, if you just force a few things. Like, no more land wasted in growing grapes for wine or grains for whiskey and beer. No cropland used for tobacco. No more grain wasted on animals for meat, just grain for people. No more rich diets for the rich countries, share equally for everyone. No more trade barriers; too bad for the farmers in Japan and France, those countries would just have to accept their dependence on other countries for their food. It is easy to see that at least some of those might actually be a pretty good thing; however, the kicker is how do you get them to happen? After all, Mussolinill did make the trains run on time. How could you force these things without a totalitarian state? Are you willing to give up your ability to choose for yourself for the common good? It is not pretty, is it? Cohen looked at all the various population estimates and concluded that most fell into the range of 4 to 16 billion. Taking the highest value when researchers offered a range, Cohen calculated a high median of 12 billion and taking the lower part of the range a low median of 7.7 billion. The good news in this is 12 billion is twice as many people as we have now. The bad news is that the projections for world population for 2050 are between 7.8 and 12.5 billion. That means we have got no more than 50 years before we exceed the nominal carrying capacity of the earth. Cohen also offers a qualifying observation by stating the "First Law of Information," which asserts that 97.6% of all statistics are made up. This helps us appreciate that application of these numbers to real life is subject to a lot of assumptions and insufficiencies in our understanding of the processes and data. However, we can draw some insights from all of this. What it comes down to is that if you choose the fully sustainable, non-fossil fuel long-term options with only limited social integration, the various estimates Cohen looked at give you a number like 1 billion or less people that the earth can support. That means 5 out of 6 of us have got to go, plus no new babies without an offsetting death. On the other hand, if you let technology continue to do its thing and perhaps get even better, the picture need not be so bleak. We haven't made all our farmland as productive as it can be. Remember, the Chinese get twice the food value per hectare as we do in the United States. There is also a lot of land that would become arable if we could get water to it. And, of course, in case you need to go back and check the title of this book, there are alternatives to fossil fuels to provide the energy to power that technology. So given a positive and perhaps optimistic view of technology, we can look to some of the high technology assumption based studies from Cohen's review. From the semi-credible set of these, we can find estimates from 19 to 157 billion as the number of people the earth could support with a rough average coming in about 60 billion. This is a good time to be reminded of the First Law of Information. The middle to lower end of this range, however, might be done without wholesale social reprogramming. Hopefully we would see the improvement in the quality of life in the developing countries as they industrialize and increase their use of energy. Hopefully, also this would lead to a matching of the reduction in fertility rates that has been observed in the developed countries, which in turn would lead to an eventual balancing of the human population. The point to all this is the near-term future of the human race depends on technology. If we turn away from technology, a very large fraction of the current and future human race will starve. If we just keep on as we are, with our current level of technology and dependence on fossil fuel resources, in the near term it will be a race between fertility decrease and our ability to feed ourselves, with, frankly, disaster the slight odds-on bet. In a slightly longer term, dependence on fossil fuels has got to lead to either social chaos or environmental disaster. There are no other end points to that road. It doesn't go anywhere else. However, if we accept that it is technology that makes us human, that technology uniquely identifies us as the only animal that can choose its future, we can choose to live, choose to make it a better world for everyone and all life. This means more and better technology. It means more efficient technology that is kinder to the planet but also allows humans to support large numbers in a high quality of life. That road is not easy and has a number of ways to screw up. However, it is a road that can lead to a happier place, a better place. Two Concluding Thoughts on the Case for Technology Two more points and I will end my defense of technology. First, I want to bring you back from all the historical tour and all the numbers about population to something more directly personal. Let me ask you two questions. What do you do for a living? What did you have for breakfast? Don't see any connection between these questions or of their connection to·the subject of technology? Don't worry, the point will come out shortly. I am just trying to bring the idea of technology back from this grand vision to its impact on your daily life. Just as a wild guess, your answer to the first question was something that, say 500 years ago, didn't even exist. If we look 20,000 years ago, the only job was" get food." Even if you have a really directly socially valuable job like a medical doctor, 20,000 years ago you would have been extraneous. That is, the tribe couldn't afford you. What, no way! A doctor could save lives, surely a tribe would value such a skill. Well, sure, but the tribe could not afford taking one of their members out of the productive */I* getting the food" job for 20 years while that individual learned all those doctor skills. If you examine the "what you do for a living" just a bit I think you will see a grand interconnectedness of all things. I personally find it pretty remarkable that we have a society that values nuclear engineers enough that I can make a living at it. Think about it. Somehow what I have done has been of enough value that, through various taxpayer and utility ratepayers, society has given me enough money for food and shelter. The tribe 20,000 years ago wouldn't have put up with me for a day. You see, that is why we as humans are successful, wildly successful in fact. We work together. "Yeah, sure we do," you reply, " read a newspaper lately?" Well, *O.K.,* we fuss and fight a good deal and some of us do some pretty stupid and pretty mean things. But the degree of cooperation is amazing if you just step back a bit. O.K., what did you have for breakfast: orange juice, coffee, toast, maybe some cereal and milk? Where do these things come from? Orange juice came from Florida or California. Coffee came from South America. Bread for the toast came perhaps from Kansas; cereal, from the Mid-West somewhere. The jam on the toast may have come from Oregon, or maybe Chile. Milk is probably the only thing that came from within a hundred miles of your breakfast table. Think about it. There were hundreds of people involved in your breakfast. Farmers, food-processing workers, packaging manufacturers, transportation people, energy producers, wholesale and retail people. Perhaps each one only spent a second on their personal contribution to your personal breakfast, but they touch thousands of other people's breakfasts as well. In turn, you buying the various components of your breakfast supported, in your part, all those people. They in turn, in some way or another, bought whatever you provide to society that allowed you to buy breakfast. Pretty amazing, don't you think? Now when you look at all that, think about what ties all the planetwide interconnection, Yep, you guessed it: technology. Without technology, you get what is available within your personal reach, and what you produce is available only to those who are near enough that you can personally carry it to them on your own two feet. Technology makes our world work. It gives you personally a productive and socially valuable way to make both a living and to provide your contribution to the rest of us**.** I want you to stop a minute and really think about that. What would your life be like without technology? Could you do what you currently do? Would anyone be able to use what you do? Would anyone pay you for that? "But I am a school teacher," you say, "of course, they would pay me!" Are you sure? Why do you need schools if there is no technology? All I need is to teach the kid how to farm and how to hunt. Sons and daughters can learn that by working in the fields along with their parents. See what I mean? Now, I have hopefully reset your brain. Sure, you are still going to be hit with daily "technology is bad" messages. Hopefully, you are a bit more shielded against that din, and you have been given some perspective to balance that message and are prepared to see the true critical value of technology to human existence. The point is that technology is what makes us human. Without it, we are just slightly smarter monkeys. You may feel that 6 billion of us are too many, and that may very well be. I personally don't know how to make that value decision. Which particular person does one select as being one of the excess ones? However, the fact is that there are 6 billion of us, and it looks like we are headed for 10 to 12 billion in the next 50 years, Without not only the technology we have, but significantly better and more environmentally friendly technology, the world is going to get ugly as we approach these numbers, On the other hand, with the right technologies we can not only support those numbers, we can do it while we close the gap between the haves and have-nots. We can make it a better place for everyone. It takes technology and the energy to drive it. Choosing technology is what we have to do to secure the evolutionary selection of us as a successful species, Remember, some pages back in discussing the unlikely evolutionary path to us, I said we are not the chosen, unless. Unless we choose us. This is what I meant. We are totally unique in all of evolutionary history. We humans have the unique ability and opportunity to choose either our evolutionary success or failure. A choice of technology gives us a chance. A choice rejecting technology dooms us as a species and gives the cockroaches the chance in our place. Nature doesn't care what survives, algae seas, dinosaurs, humans, cockroaches, or whatever is successful. If we care, we have to choose correctly. As an aside, let me address a point of philosophy here. If any of this offends your personal theology, I offer this for your consideration. Genesis tells us God gave all the Earth to humanity and charged us with the stewardship thereof. So it is ours to use as well as we can. That insightful social philosopher Niccolo Machiavelli put it this way in 1501: "What remains to be done must be done by you; since in order not to deprive us of our free will and such share of glory as belongs to us, God will not do everything Himself." *O.K.,* you are saying, "I give." You have beaten the socks off me. Technology is good; technology is the identifying human trait and our only hope. But what is this stuff about choosing technology or not? Technology just happens doesn't it? I mean, technology always advances, it always has, so why the big deal? Well, that is my last point on technology. It doesn't always just happen, and people have chosen to turn away from technology. In what might have seemed at the time to be a practical social decision, huge future implications were imposed on many generations to come. It has happened. Let me take you on one more trip through history. I think you will find it enlightening. In *Guns, Germs, and Steel,* Jared Diamond explores the question of why the European societies came to be dominate over all the other human cultures on earth. It is a fascinating story and provides a lot of insight into how modern societies evolved. In moving through history, he comes across a very odd discontinuity. He observes that if you came to earth from space in the year 1400 A.D., looked around, and went home to write your research paper on the probable future of the earth, you would clearly conclude the Chinese would run the entire planet shortly. Furthermore, you could conclude they would do it pretty darn well. If those same extraterrestrial researchers were to pop into their time machine and come back to earth in any year from say 1800 to now, they would be totally amazed to see China as a large, but relatively backward, country, struggling to catch up with their European and American peers. To understand the significance of this, you have to go on that research trip with the extraterrestrials and look at China before 1400. In *The Lever af Riches,* Joel Mokyr dedicates one chapter looking at the comparisons of technology development in China to that in Europe. He lists the following as technology advantages China had in the centuries before 1400: • Extensive water control projects, alternately draining and irrigating land, significantly boosting agricultural production • Sophisticated iron plow introduced sixth century B.C. • Seed drills and other farm tools, introduced around 1000 *A.D.* • Chemical and organic fertilizers and pesticides used • Blast furnaces and casting of iron as early as 200 B.C., not known in Europe until fourteenth century • Advanced use of power sources in textile production, not seen in Europe until the Industrial Revolution • Invention of compass around 960 A.D. • Major advances in maritime technology (more in a bit on this) • Invention of paper around 100 A.D. (application as toilet paper by *590 A.D.).* In the year 1400 AD., China was a world power, perhaps the only true world power. Their technology in agriculture, textiles, metallurgy, and maritime transportation were far in advance of any other country. They had a strong central government and a very healthy economy. Their naval strength provides a real insight into the degree of this dominance. Dr. Diamond sends us to an extremely readable book *When China Ruled the Seas-The Treasure Fleet of the Dragon Throne 1405-1433* by Dr. Louise Levathes. Dr. Levathes takes us on an inside tour of the Chinese empire during these years. She focuses on the great treasure fleets that China set forth in these early years of the fifteenth century. In her book she has a wonderful graphic that overlays a Chinese vessel of the treasure fleet (-1410) with Columbus's *St. Maria* (1492). At 85 feet in length and three masts, the *St. Maria* is dwarfed by the nine-masted, 400-foot-long Chinese vessel. The Chinese sailed fleets of these magnificent vessels throughout oceans of South Asia, to India, and even as far as the eastern coast of Africa. With this naval domination China claimed tribute from Japan, Korea, the nations of the Malay Archipelago, and various states within what is now India. Through both trade and the occasional application of military force, China provided an enlightened and progressive direction for all the nations within this sphere of influence. If two princes in India were fighting over a throne, it was the recognition, or lack thereof, from the Chinese emperor that decided who would rule. Setting a policy of religious inclusion and tolerance, the Chinese engaged the Arabian traders and calmed religious disputes within Asia. With applications of power sources in textiles and advanced metallurgy, the Chinese were in the same position in 1400 as the British were in 1750, ready to launch into the Industrial Revolution. They traded with nations thousands of miles from home with vast, sophisticated shipping fleets. They were poised to extend this trade all the way to Europe and perhaps find the New World by going east instead of the European's going west in search of the rich Chinese markets. But if we pop into that extraterrestrial time machine and drop into China in 1800, we find a technologically backward nation, humbled by a relatively small force of Europeans with "modern" military technology who wantonly imposed their will on the Chinese. The Chinese have been struggling to catch up with European and American technology ever since and so far not quite being able to do that. The domination of China by the Japanese during World War II shows how complete the turnaround was. In 1400 Japan was but one of many vassal states huddled about the feet of the Imperial Chinese throne. In 1940 the Japanese military crushed the Chinese government while marching on to control much of South Asia. What could have happened to turn this clear champion of technology, trade, enlightened leadership with all its advantages over both its neighbors and yet-distant foreign competitors into such a weak, backward giant? Mokyr goes through a pretty complete list of potential causes. He looks at diet, climate, and inherent philosophical mindset rejecting each as a credible actor mainly on the bases that all of these conditions were present during the period of technological and economic growth as well as the subsequent stagnation. Therefore, these were not determining factors in the turnabout. In the end he concludes, as does Diamond and Levathes, that it was just politics. Yep, that is right. It was good, old human politics. Dr. Levathes gives us a delightful insider's view of the personalities and politics of Imperial progressions during this critical time period. To make a short story of it, the party that had been in control during the expansionist period supported the great treasure fleets, commerce with foreign nations, use and expansion of technology, and a rather harsh control of the rival party. The rival party was based on Confucian philosophy that preached a rigid, inward-looking, controlled existence. When the Confucian party gained control of the throne, they had their opportunity to push back on the prior ruling party that had oppressed them so harshly for so long. And they did. They wanted nothing to do with foreigners; we have all we need at home, here in China, they said. The fleet was disbanded and the making of ocean-going vessels forbidden. Technology was no longer "encouraged." Again, their position was what we have is good enough, stop with all this new nonsense. Over a period of just a few years, the course of the entire nation was shifted from what would have appeared to be a bright future as the leading power in the world to a large, but relatively insignificant, backwater, rich in history and culture, but all backward looking to a former glory. That was it. A shift in the political agenda. At the time, to the leaders in control, one that made sense. Focus at home, use what you have now, create order, discipline, control. In 50 years Japanese pirates controlled the coast of China, and the former ruler of the seas from Asia to Africa could not get out of their harbors safely. So, you see **if the "technology is bad" message gets incorporated into too many of our daily decisions**, we can turn from our bright future into something else. The difference is that this time the stakes are much higher than they were in fifteenth century China. If we, in the developed nations, make the wrong choices, we doom all of humanity by our folly. It is not just that we miss the potential bright future, we miss the chance to avoid the combined human population growth and resources exhaustion disaster coming at us like a runaway train. Technology is the only way to prevent that train wreck. We can hear the siren's call of anti-technology, come back to nature and let the train run us down in a bloody mess, or we can try our best to use technology wisely and win free to make a better life for everyone.

#### Tech thought is inevitable

Kateb, professor of politics – Princeton, ‘97

(George, http://findarticles.com/p/articles/mi\_m2267/is\_/ai\_19952031)

But the question arises as to where a genuine principle of limitation on technological endeavor would come from. It is scarcely conceivable that Western humanity--and by now most of humanity, because of their pleasures and interests and their own passions and desires and motives--would halt the technological project. Even if, by some change of heart, Western humanity could adopt an altered relation to reality and human beings, how could it be enforced and allowed to yield its effects? The technological project can be stopped only by some global catastrophe that it had helped to cause or was powerless to avoid. Heidegger's teasing invocation of the idea that a saving remedy grows with the worst danger is useless. In any case, no one would want the technological project halted, if the only way was a global catastrophe. Perhaps even the survivors would not want to block its reemergence. As for our generation and the indefinite future, many of us are prepared to say that there are many things we wish that modern science did not know or is likely to find out and many things we wish that modern technology did not know how to do. When referring in 1955 to the new sciences of life, Heidegger says We do not stop to consider that an attack with technological means is being prepared upon the life and nature of man compared with which the explosion of the hydrogen bomb means little. For precisely if the hydrogen bombs do not explode and human life on earth is preserved, an uncanny change in the world moves upon us (1966, p. 52). The implication is that it is less bad for the human status or stature and for the human relation to reality that there be nuclear destruction than that (what we today call) genetic engineering should go from success to success. To such lengths can a mind push itself when it marvels first at the passions, drives, and motives that are implicated in modern technology, and then marvels at the feats of technological prowess. The sense of wonder is entangled with a feeling of horror. We are past even the sublime, as conceptualized under the influence of Milton's imagination of Satan and Hell. It is plain that so much of the spirit of the West is invested in modern technology. We have referred to anger, alienation, resentment. But that cannot be the whole story. Other considerations we can mention include the following: a taste for virtuosity, skill for its own sake, an enlarged fascination with technique in itself, and, along with these, an aesthetic craving to make matter or nature beautiful or more beautiful; and then, too, sheer exhilaration, a questing, adventurous spirit that is reckless, heedless of danger, finding in obstacles opportunities for self-overcoming, for daring, for the very sort of daring that Heidegger praises so eloquently when in 1935 he discusses the Greek world in An Introduction to Metaphysics (1961, esp. pp. 123-39). All these considerations move away from anger, anxiety, resentment, and so on. The truth of the matter, I think, is that the project of modern technology, just like that of modern science, must attract a turbulence of response. The very passions and drives and motives that look almost villainous or hypermasculine simultaneously look like marks of the highest human aspiration, or, at the least, are not to be cut loose from the highest human aspiration.

#### Engagement with technocracy is more effective than passive rejection

Jiménez-Aleixandre 2, professor of education – University of Santiago de Compostela, and Pereiro-Muñoz High School Castelao, Vigo (Spain) (Maria-Pilar and Cristina, “Knowledge producers or knowledge consumers? Argumentation and decision making about environmental management,” International Journal of Science Education Vol. 24, No. 11, p. 1171–1190)

If science education and environmental education have as a goal to develop **critical thinking and** to promote **decision making**, it seems that the acknowledgement of a variety of experts and expertise is of relevance to both. **Otherwise citizens could be unable to challenge a common view** that places economical issues and technical features over other types of values or concerns. As McGinn and Roth (1999) argue, citizens should be prepared to participate in scientific practice, to be involved in situations where science is, if not created, at least used. The assessment of environmental management is, in our opinion, one of these, and citizens do not need to possess all the technical knowledge to be able to examine the positive and negative impacts and to weigh them up. The identification of instances of scientific practice in classroom discourse is difficult especially if this practice is viewed as a complex process, not as fixed ‘steps’. Several instances were identified when it could be said that students acted as a knowledge-producing community in spite of the fact that the students, particularly at the beginning of the sequence, expressed doubts about their capacities to assess a project written by experts and endorsed by a government office. Perhaps these doubts relate to the nature of the project, a ‘real life’ object that made its way into the classroom, into the ‘school life’. As Brown et al. (1989) point out, there is usually a difference between practitioners’ tasks and stereotyped school tasks and, it could be added, students are not used to being confronted with the complexity of ‘life-size’ problems. However, as the sequence proceeded, **the students assumed the role of experts**, exposing inconsistencies in the project, offering alternatives and discussing it with one of its authors. The issue of expertise is worthy of attention and it needs to be explored in different contexts where the relationships among technical expertise, values hierarchies and possible biases caused by the subject matter could be unravelled. One of the objectives of environmental education is to **empower people with the capacity of decision making**; for this purpose the acknowledging of multiple expertise is crucial.

#### The earth is becoming uninhabitable—only management can avoid extinction of all life

Ward, 9 (Peter, Professor of biology and Earth and space sciences at the University of Washington and an astrobiologist with NASA, The Medea Hypothesis, 52-54)

Calcium is an important ingredient in this process, and it is found in two main sources on a planet's surface: igneous rocks and, most importantly, the sedimentary rocks called limestone. Calcium reacts with carbon dioxide to form limestone. Calcium thus draws CO2 out of the atmosphere. When CO2 begins to increase in the atmosphere, more limestone formation will occur. This can only happen, however, if there is a steady source of new calcium available. The calcium con­tent is steadily made available by plate tectonics, for the formation of new mountains brings new sources of calcium back into the system in its magmas and by exhuming ancient limestone, eroding it, and thus releasing its calcium to react with more CO2. At convergent plate margins, where the huge slabs of the Earth's surface dive back down into the planet, some of the sediments resting on the descend­ing part are carried down into the Earth. High temperature and pressure convert some of these rocks into metamorphic rocks. One of the reactions is the carbonate metamorphic reaction, where lime­stone combining with silica converts to a calcium silicate—and car­bon dioxide. The CO2 can then be liberated back into the atmosphere in volcanic eruptions. The planetary thermostat requires a balance between the amount of CO2 being pumped into the atmosphere through volcanic action and the amount being taken out through the formation of limestone. The entire system is driven by heat emanating from the Earth's in­terior, which causes plate tectonics. But as we have seen there is more to this cycle than simply heating from the interior. Weather­ing on the surface of the Earth is crucial as well, and the rate of weathering is highly sensitive to temperature, for reaction rates in­volved in weathering tend to increase as temperature increases. This will cause silicate rocks to break down faster and thus create more calcium, the building block of limestone. With more calcium avail­able, more limestone can form. But the rate of limestone formation affects the CO2 content of the atmosphere, and when more lime‑ stone forms there is less and less CO2 in the atmosphere, causing the climate to cool. Here is a key aspect of the overall Earth system that helps refute either Gaia or Medea. If the Medea hypothesis is correct, we should be able to observe or measure a reduction of habitability potential (as measured by the carrying capacity, or total amount of life that can live on our planet at any give time) through time, or as measured by an observable shortening of the Earth's ability to be habitable for life in the future. For our own Earth, habitability will ultimately end for two reasons. The first of these is not Medean; it is a one-way effect. The ever-increasing energy output of our Sun, a phenomenon of all stars on what is called the main sequence, will ultimately cause the loss of the Earth's oceans (sometime in the next 2 to 3 billion years, accord­ing to new calculations). When the oceans are lost to space, planetary temperatures will rise to uninhabitable levels. But long before that, life will have died out on the Earth's surface through a mechanism that is Medean: because of life, the Earth will lose one resource with­out which the main trophic level of life itself—photosynthetic or­ganisms, from microbes to higher plants—can no longer survive. This dwindling resource, ironically, (in this time when human society worries about too much of it), is atmospheric carbon dioxide. The Medean reduction of carbon dioxide will then cause a further reduc­tion of planetary habitability because the CO2 drop will trigger a drop in atmospheric oxygen to a level too low to support animal life. This is an example of a "Medean" property: it is because of life that the amount of CO2 in the Earth's atmosphere has been steadily dropping over the last 200 million years. It is life that makes most calcium car­bonate deposits, such as coral skeletons, and thus life that ultimately caused the drop in CO2, since it takes CO2 out of the atmosphere to build this kind of skeleton. Life will continue to do this until a lethal lower limit is attained. This finding is important: in chapter 8 I will show a graph that supports this statement. As pointed out by David Schwartzman, while limestone can be formed with or without life, life is far more efficient at producing calcium carbonate structures—a process that draws CO2 out of the atmosphere—than nonlife. There is only one way out of the lethal box imposed by Darwinian life: the rise of intelligence capable of devising planetary-scale engi­neering. Technical, or tool-producing, intelligence is the unique solution to the planetary dilemma caused by Medean properties of life. New astrobiological work indicates that Venus, Mars, Europa, and Titan are potentially habitable worlds at the present time, at least for microbes, just as the Earth was early in its history. Did they undergo a reduction in habitability because of prior Medean forces? And cer­tainly the cosmos is filled with Earth-like planets, based on both new modeling of still-forming solar systems and observations by the Butler and Marcy planet-finding missions. While the "planet find­ers" cannot yet directly observe any planet that is Earth-sized (a planet of this size is still too small for us to see with our current technologies), the orbits exhibited by some of the Jupiter- and Saturn-sized planets that can be observed suggest that smaller, Earth-like planets might exist there. Would Medean forces occur in alien life, as well as Earth life? If such life were Darwinian, the answer would be "certainly."

#### Space colonization solves extinction

Filling Space 19, 4-19, "Deflecting Existential Risk with Space Colonization," Filling Space, https://filling-space.com/2019/04/19/deflecting-existential-risk-with-space-colonization/

The first living organism on Earth emerged approximately three and a half billion years ago. Since then, life has evolved into countless forms and colonized the planet. But the story of life is not a rosy one. At least five mass extinctions have occurred, and nearly all species that have ever existed on our planet are now dead. One of the most well-understood mass extinctions occurred when the Alvarez asteroid impacted Earth and, likely combined with other factors, killed many dinosaurs and other species. Life then had no tools to detect the coming asteroid or to be able to plan proactively to ensure its survival.

In order to avoid sharing the same fate as the dinosaurs, scholars argue that humans should become a multi-planetary species. We spoke with Professor Gonzalo Munevar, Emeritus Professor at Lawrence Technical University, to hear his thoughts on the existential risks we face and how colonization of the cosmos can help us address them. He has written extensively about the philosophy of space exploration and human consciousness.

Why do you argue that “failure to move into the cosmos would condemn us to oblivion”?

By having a significant presence in the solar system in the next few thousands of years and beyond, we will be in a better position to deflect asteroids and comets that might bring the end of humanity, and much other Earth life, in a horrible collision. And if perchance one such catastrophe proves inevitable (e.g. a rogue planet passing through the solar system), humanity would still survive by having colonized Mars and other bodies, as well as by having built artificial space colonies of the type advocated by Gerard O’Neill.

Once the sun begins to turn into a red giant in a few billion years, we must have long moved into the outer solar system. In the very long run, we have to move into other solar systems. Relativistic-speed starships would be nice, but they are not necessary for the task of moving humanity to the stars. We can reach them, slowly but surely, by propelling some of our space colonies away from the sun, carrying perhaps millions of human beings. They would take advantage of the many resources to be found in the Oort Cloud, and then of equivalent clouds in other solar systems. Even interstellar space has resources to offer. Nuclear energy, probably fusion, would likely be required. It may take us tens of thousands of years, but in the cosmic time scale, that is but a blink in the eye.

What are these catastrophic threats? Are there any records of catastrophic events happening before humans appeared on Earth?

I have already mentioned collisions with asteroids and comets. Although the active geology of our planet tends to erase the record of many collisions, we can find a well-preserved record on the Moon and Venus, the two closest bodies to Earth. On the 600-million-years-old Venusian surface, the spacecraft Magellan discovered about one thousand impact craters at least twice the diameter of meteor craters on Earth. This impact record makes it reasonable to estimate a catastrophic impact on Earth every half a million years or so. Collisions with bodies of 5 km across would happen, on the average, every 20 million years. Apart from the Alvarez asteroid (crater near Yucatan) that led to the extinction of the dinosaurs and the majority of species on Earth 65 million years ago, there have been at least two more impacts by asteroids 10 km or larger in the last 300 million years.

How could human colonization of outer space save other terrestrial life?

On both O’Neill types of colonies as well as on colonies on other planets, and particularly on terraformed planets, we would need all sorts of organisms like bacteria and plants for food, medicine, and ornamentation, as well as many animals for food and other purposes. We cannot have a proper colony without an Earthly environment to surround and nourish us. So, we have to take much other terrestrial life with us in order to survive and flourish. And given the value of biodiversity we would make it a point to take a great variety of organisms that contribute to our biosphere. Of course, we should heed Mark Twain and be sure not to include mosquitoes in our future space arks. I myself would keep out tarantulas and some other obnoxious viruses, bacteria, plants, and animals.

#### Yes link to cap— this critiques our ability to engage in a capitalism/the economy.

Kalanges 10– Kristine Kalanges is Associate Professor of Law and Concurrent Associate Professor of Political Science at the University of Notre Dame. From the Violence of Positivism to the Ethics of Encounter: Restoring Relationality to International Relations, 9-23-2010, msm//rehighlighted *~bxnk*

The Industrial Revolution had ramifications throughout economic, cultural and martial relations. Individuals as laborers, citizens or soldiers were transformed into commodities to be manipulated by managers, politicians and other ancestors of today’s technocrats. Left with little local or even regional political significance (apart, of course, from their role as cogs in the machine of the new economy), the expanding lower classes found identification within the freshly-delineated borders of 12 the nation-state.

#### Capitalism solves environmental crisis - industrial development, technological advances, and any alternative fails

Zitelmann 20 [(Dr. Rainer, a historian and sociologist. He is also a world-renowned author, successful businessman and real estate investor. Zitelmann has written a total of 24 books and has a doctorate in political science and sociology) “‘System Change Not Climate Change’: Capitalism And Environmental Destruction” Forbes, 7/13/2020] BC

The Price Of Growth—Destruction Of The Environment?

But isn’t there a price for this growth: environment devastation? Of course, nobody would deny that industrialization causes environmental problems. But the assertion that growth automatically leads to ever accelerating environmental degradation is simply false. Yale University’s Environmental Performance Index (EPI) uses 16 indicators to rank countries on environmental health, air quality, water, biodiversity, natural resources and pollution. These indicators have been selected to reflect both the current baseline and the dynamics of national ecosystems. One of the Index’s most striking findings is that there is a strong correlation between a state’s wealth and its environmental performance. Most developed capitalist countries achieve high environmental standards. Those countries with the worst EPI scores, such as Ethiopia, Mali, Mauritania, Chad and Niger, are all poor. They have both low investment capacity for infrastructure, including water and sanitation, and tend to have weak environmental regulatory authorities.

Contrary to prevailing perceptions, industrial development and technological advances have contributed significantly to relieving the burden on the environment. Both Indur Goklany in his book The Improving State of the World and Steven Pinker in chapter ten (“The Environment”) of his book Enlightenment Now demonstrate that we are not only living longer, healthier lives in unprecedented prosperity, but we are also doing so on a comparatively clean planet.

Researchers have confirmed that economic freedom—in other words, more capitalism—leads to higher, not lower, environmental quality.

Every year, the Heritage Foundation compiles its Index of Economic Freedom, which analyzes individual levels of economic freedom, and thus capitalism, in countries around the world. The Heritage Foundation’s researchers also measure the correlation between each country’s environmental performance and its economic freedom. The results couldn’t be clearer: the world’s most economically free countries achieve the highest environmental performance rankings with an average score of 76.1, followed by the countries that are “mostly free,” which score an average of 69.5. In stark contrast, the economically “repressed” and “mostly unfree” countries all score less than 50 for environmental performance.

Is Government The Best Solution To Environmental Problems?

Anti-capitalists frequently claim that central government is the best solution to environmental problems. And there is no doubt that state regulations to safeguard the environment are important. But state regulations, cited by anti-capitalists as a panacea for environmental issues, often achieve the opposite of what they were intended to do. Hardly any other country in the world touts its green credentials as much as Germany. According to even the most conservative estimates, Germany’s so-called “energy transition” is set to cost a total of almost €500 billion by 2025.

But the results of this massive investment is sobering, as an analysis by McKinsey reveals, “Germany is set to miss several key energy transition targets for the year 2020, and the country’s high power supply security is at risk unless new generation capacity and grid infrastructure are built in time for the coal and nuclear exit and electrification of transportation networks is accelerated.”

For decades, environmentalists in Germany focused on shutting down nuclear power plants. However, the phasing out of nuclear power has left Germany in a poor position in terms of CO2 emissions compared to other countries. It is not without good reason that Germany’s energy policy has been described as the dumbest in the world.

The latest generation of nuclear power plants are much safer than their predecessors. Despite what environmentalists might claim, impartial calculations have confirmed that it is impossible to meet the world’s energy needs from solar and wind power alone. Enlightened environmentalists are therefore now calling for nuclear power to be rightfully included in the fight against climate change. And yet, this is precisely what is being prevented in Germany by politicians—not capitalism. This example, just one of many, shows that government environmental policy is often ineffective. In some instances, it even achieves the opposite of what it was originally intended to, i.e. it exacerbates existing environmental problems.

It is also wrong to think that capitalism necessarily leads to ever greater waste of limited natural resources. Just take the smartphone for example, one of the most environmentally friendly of capitalism’s many achievements. With just one small device, a whole plethora of devices that used to consume resources in the past, such as the telephone, camera, calculator, navigation system, dictation machine, alarm clock, flashlight and many others, have been replaced. Smartphones also help to reduce the consumption of paper as many people choose not to take notes on paper and, for example, use their iPhone instead of a calendar to enter appointments.

Those who call for “system change” instead of “climate change” do not usually say which system they would prefer. All they are really sure of is that any new system should not be based on free market economics and that the state should play the decisive role. The simple fact is that socialism has failed in every country every time it has been tried—and socialism has damaged the environment more than any capitalist system. Murray Feshbach documents examples of the environmental destruction wrought by socialism in his book Ecological Disaster. Cleaning Up the Hidden Legacy of the Soviet Regime. As the book progresses through chapters such as “A Nuclear Plague,” “Dying Lakes, Rivers, and Inland Seas” and “Pollution of the Air and Land,” it becomes clear that this non-capitalist system was responsible for the greatest environmental destruction in history. Anti-capitalists may well reply that they do not want a system like the Soviet Union. And yet, they cannot name a single real-world system—at any time in the history of mankind—that provides better environmental solutions than capitalism.

#### AI solves warming

**Vincent 19** [(James- Senior Reporter for the Verge)” Here’s how AI can help fight climate change according to the field’s top thinkers-From monitoring deforestation to designing low-carbon materials”, 2019] SS

The AI renaissance of recent years has led many to ask how this technology can help with one of the greatest threats facing humanity: climate change**.** A new research paper authored by some of the field’s best-known thinkers aims to answer this question, giving a number of examples of how machine learning could help prevent human destruction.

The suggested use-cases are varied, ranging from using AI and satellite imagery to better monitor deforestation, to developing new materials that can replace steel and cement (the **production of** which accounts for nine percent of global green house gas emissions).

AI IS NO SILVER BULLET, BUT IT WILL PROVE INVALUABLE IN THE COMING CLIMATE FIGHT

But despite this variety, the paper (which we spotted via MIT Technology Review) returns time and time again to a few broad areas of deployment. Prominent among these are using machine vision to monitor the environment; using data analysis to find inefficiencies in emission-heavy industries; **and** using AI to model complex systems, like Earth’s own climate, so we can better prepare for future changes**.**

The authors of the paper — which include DeepMind CEO Demis Hassabis, Turing award winner Yoshua Bengio, and Google Brain co-founder Andrew Ng — say that AI could be “invaluable” in mitigating and preventing the worse effects of climate change, but note that it is not a “silver bullet” and that political action is desperately needed, too.

“Technology alone is not enough,” write the paper’s authors, who were led by David Rolnick, a postdoctoral fellow at the University of Pennsylvania. “[T]echnologies that would reduce climate change have been available for years, but have largely not been adopted at scale by society. While we hope that ML will be useful in reducing the costs associated with climate action, humanity also must decide to act.”

In total, the paper suggests 13 fields where machine learning could be deployed (from which we’ve selected eight examples), which are categorized by the time-frame of their potential impact, and whether or not the technology involved is developed enough to reap certain rewards. You can read the full paper for yourself here, or browse our list below.

Build better electricity systems. Electricity systems are “awash with data” but too little is being done to take advantage of this information. Machine learning could help by forecasting electricity generation and demand, allowing suppliers to better integrate renewable resources into national grids and reduce waste. Google’s UK lab DeepMind has demonstrated this sort of work already, using AI to predict the energy output of wind farms.

Monitor agricultural emissions and deforestation. Greenhouse gases aren’t just emitted by engines and power plants — a great deal comes from the destruction of trees, peatland, and other plant life which has captured carbon through the process of photosynthesis over millions of years. Deforestation and unsustainable agriculture leads to this carbon being released back into the atmosphere, but using satellite imagery and AI, we can pinpoint where this is happening and protect these natural carbon sinks.

Create new low-carbon materials. The paper’s authors note that nine percent of all global emissions of greenhouse gases come from the production of concrete and steel. Machine learning could help reduce this figure by helping to develop low-carbon alternatives to these materials. AI helps scientists discover new materials by allowing them to model the properties and interactions of never-before-seen chemical compounds.

Predict extreme weather events. Many of the biggest effects of climate change in the coming decades will be driven by hugely complex systems, like changes in cloud cover and ice sheet dynamics. These are exactly the sort of problems AI is great at digging into. Modeling these changes will help scientists predict extreme weather events, like droughts and hurricanes, which in turn will help governments protect against their worst effects.

Make transportation more efficient.The transportation sector accounts for a quarter of global energy-related CO2 emissions, with two-thirds of this generated by road users. As with electricity systems, machine learning could make this sector more efficient, reducing the number of wasted journeys, increasing vehicle efficiency, and shifting freight to low-carbon options like rail. **A**I could also reduce car usage through the deployment of shared, autonomous vehicles, but the authors note that this technology is still not proven.

Reduce wasted energy from buildings. Energy consumed in buildings accounts for another quarter of global energy-related CO2 emissions, and presents some of “the lowest-hanging fruit” for climate action. Buildings are long-lasting and are rarely retrofitted with new technology. Adding just a few smart sensors to monitor air temperature, water temperature, and energy use, can reduce energy usage by 20 percent in a single building, and large-scale projects monitoring whole cities could have an even greater impact.

Geoengineer a more reflective Earth. This use-case is probably the most extreme and speculative of all those mentioned, but it’s one some scientists are hopeful about. If we can find ways to make clouds more reflective or create artificial clouds using aerosols, we could reflect more of the Sun’s heat back into space. That’s a big if though, and modeling the potential side-effects of any schemes is hugely important. AI could help with this, but the paper’s authors note there would still be significant “governance challenges” ahead.