## T

#### Interp: the aff may only claim offense from the hypothetical implementation of Resolved: The appropriation of outer space by private entities is unjust.

#### Resolved means a legislative policy

**Words and Phrases 64** Words and Phrases Permanent Edition. “Resolved”. 1964. ED

**Definition of the word “resolve,” given by Webster is “to express an opinion or determination by resolution or vote; as ‘it was resolved by the legislature**;” It is of similar force to the word “enact,” which is defined by Bouvier as meaning “**to establish by law**”.

#### Outer space means anything above Earth’s Karman line

**Dunnett 21** (Oliver Tristan, lecturer in geography at Queen’s University Belfast). Earth, Cosmos and Culture: Geographies of Outer Space in Britain, 1900–2020 (1st ed.). Routledge. 2021.<https://doi.org/10.4324/9780815356301> EE

In such ways, this book argues that Britain became a home to rich discourses of outer space, both feeding from and contributing to iconic achievements in space exploration, while also embracing the cosmos in imaginative and philosophical ways.2 **INSERT FOOTNOTE 2** 2 **This book primarily uses the term ‘outer space’ to describe the realm beyond the Earth’s atmosphere, conventionally accepted as beginning at the Kármán line of 100km above sea level**. Other terms such as ‘interplanetary space’, ‘interstellar space’, ‘cosmos’, and ‘the heavens’ are used in specific contexts. **END FOOTNOTE 2** Cognisant of this spatial context, a central aim is to demonstrate how contemporary geographical enquiry can provide specific and valuable perspectives from which to understand outer space. This is an argument that was initiated by Denis Cosgrove, and his critique of Alexander von Humboldt’s seminal work Cosmos helped to demonstrate geography’s special relevance to thinking about outer space.3 The key thematic areas which provide the interface for this book’s research, therefore, are the cultural, political and scientific understandings of outer space; the context of the United Kingdom since the start of the last century; and the geographical underpinnings of their relationship.

#### In the context of space, “Appropriation” means to take as property

**Leon 18** (Amanda M., Associate, Caplin & Drysdale, JD UVA Law) "Mining for Meaning: An Examination of the Legality of Property Rights in Space Resources." Virginia Law Review, vol. 104, no. 3, May 2018, p. 497-547. HeinOnline.

**Appropriation**. The term "appropriation" also remains ambiguous. **Webster's defines** the verb "**appropriate**" **as** "**to take to oneself in exclusion of others**; **to** claim or **use as by an exclusive or pre-eminent right**; as, let no man appropriate a common benefit."16 5 Similarly, **Black's** Law Dictionary **describes "appropriate" as an act "[t]o make a thing one's own; to make a thing the subject of property**; to exercise dominion over an object to the extent, and for the purpose, of making it subserve one's own proper use or pleasure."166 Oftentimes, **appropriation refers to the setting aside of government funds, the taking of land for public purposes, or a tort of wrongfully taking another's property as one's own**. The term appropriation is often used not only with respect to real property but also with water. According to U.S. case law, a person completes an appropriation of water by diversion of the water and an application of the water to beneficial use.167 This **common use** of the term "appropriation" with respect to water **illustrates** two key points: (1) **the term applies to natural resources-e.g., water or minerals-not just real property**, **and** (2) **mining space resources and putting them to beneficial use**-e.g., selling or manufacturing the mined resources **could reasonably be interpreted as an "appropriation" of outer space**. While **the ordinary meaning of "appropriation"** reasonably **includes the taking of natural resources as well as land**, whether the drafters and parties to the OST envisioned such a broad meaning of the term remains difficult to determine with any certainty. **The prohibition against appropriation "by any other means" supports such a reading**, though**, by expanding the prohibition to other types not explicitly described**.168

#### Private entity = majority nonstate

**Warners 20** (Bill, JD Candidate, May 2021, at UIC John Marshall Law School) "Patents 254 Miles up: Jurisdictional Issues Onboard the International Space Station." UIC Review of Intellectual Property Law, vol. 19, no. 4, 2020, p. 365-380. HeinOnline.

To satisfy these three necessary requirements for a new patent regime, the ISS IGA must add an additional clause ("Clause 7") in Article 21 specifically establishing a patent regime for private nonstate third parties onboard the ISS. First, Clause 7 would define **the term "private entity" as an individual, organization, or business which is primarily privately owned and/or managed by nonstate affiliates**. Specifically defining the term "private entity" prevents confusion as to what entities qualify under the agreement and the difference between "public" and "private."99 This definition would also support the connection of Clause 1 in Article 21 to "Article 2 of the Convention Establishing the World Intellectual Property Organization." 100 A succinct definition also alleviates international concerns that the changes to the ISS IGA pushes out Partner State influence. 101 Some in the international community may still point out that Clause 7 still pushes towards a trend of outer space privatization. However, this argument fails to consider that private entities in outer space have operated in space almost as comprehensively as national organizations. 102

#### At best, it’s extra topical,

#### a] Advocacy statement: the resolution goes further than a value statement

#### b] 1AC Banschbach: the resolution is not a question of appropriation, but rather, the question of the re-appropriation of the cyborg

#### c] 1AC Toye: we’ve made a claim about the resolutions relations to shaping subjectivities

#### Extra-Topicality is a Voter for Limits and Ground - explodes the topic – they can garner offense from anything from storytelling to linguistic performance to pre-fiat epistemic critiques of rhetoric, etc. By shifting the Negative win condition away from disproving the resolution to having to disprove every single potential Extra-topical aspect, it makes Negative preparation impossible and skirts the predictable core stasis of the topic which makes Negative Ground and Fairness impossible.

#### [1] Competitive equity—any alternative wrecks it—it’s impossible to negate alternative frameworks with the ground allocated to us by the parameters of the resolution—all 1AR defense to this claim will rely on concessionary ground which isn’t a stable basis for a year of debate.

#### They don’t get to weigh the aff – it’s just as likely that they’re winning it because we weren’t able to effectively prepare to defeat it.

#### [2] Switch Side Debate – read your stuff on the neg which non-uniques your offense and is net better since a Kritik on the neg has to be tailored to the aff– otherwise your discussion starts and ends at the 1AC.

#### [3] Refinement – a 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. Only a resolution with ground on both sides allows for the most clash which controls the internal link to education. Committees outweigh because they discuss the best topic for a stasis point – even if some resolutions are bad it is net better for a group to create a topic rather than an individual.

#### [4] TVA – read the aff as a deconstruction of the neoliberal society through banning of private entities in outer space

#### T isn’t violent – A] I don’t have the power to impose a norm – only to convince you my side is better. T doesn’t ban you from the activity – the whole point is that norms should be contestable – I just say make a better arg next time. B] Exclusion is inevitable – every role of the ballot excludes some arguments and even saying T bad excludes it – that means we should delineate ground along reciprocal lines, not abandon division altogether.

#### Reading T isn’t psychic violence – that was above, but especially if we’re not going for it since reading T can be used to prevent aff shiftiness and make substance a viable option.

#### No silencing DA - Theory is just like a disad or critique we’ve said a certain practice the aff took was bad and it would’ve been better had they done it differently not that they are bad debaters – just like the cap k says the aff engaged in some practice that reinforced capitalism and it would’ve been better if they had emphasized Marxism – impositions in some form are inevitable because the negative has the burden of rejoinder and needs link arguments – every disad link says the aff did something wrong and theres an implicit version of the aff that wouldn’t have linked

#### Theory before the K – A] Prior question. My theory argument calls into question the ability to run the argument in the first place. They can’t say the same even if they criticize theory because theory makes rules of the game not just normative statements about what debaters should say. B] Fair testing. Judge their arguments knowing I wasn’t given a fair shot to answer them. Prefer theory takes out K because they could answer my arguments, but I couldn’t answer theirs. Without testing their args, we don’t know if they’re valid, so you prefer fairness impacts on strength of link. Impact turns any critical education since a marketplace of ideas where we innovate, and test ideas presumes equal access.

#### Question of what the ballot can solve for – voting neg can rectify a shift in fairness in the round but voting aff cannot do anything to resolve structural issues of disability

#### Reject aff pre empts – not clearly delineated, impossible to know implications

# Case

## Case

#### No solvency and turn – debate as a communicative act may be violent, but they’re authors don’t differentiate it from the rest of the world it’s just an institution inside the world. They misread their authors the 1AC is a “band-aid” solution their authors don’t treat debate nihilistically in isolation BUT the world and eradicating debate doesn’t change the nature of the drive that recreates violence in different forms – proves it’s not endurance. ALL they actually do is generate cruel optimism since it creates a feel good solution that places identity in a not yet but maybe to come social order where infiltration of tournaments occurs. Their attempt to reform the content of debate through examining the way war goes down in the community is complicit in an violent world that consumes their project as false energy.

#### Allies da - using debate as a mode of advocacy ensures the failure of their radical project – competition means debaters ally themselves with individuals who vote for them and alienate those who are positioned with the burden of rejoinder and forced to negate – at worst you vote negative on presumption because they don’t use debate as a stepping stone for their advocacy outside the space and don’t have a net benefit to affirming the 1ac.

#### Cyborgs are hyper-sexualized and reinforce gender stereotypes

Smith ‘9- MA art and design at GSU (Nicole R., 12-01, “Wangechi Mutu: Feminist Collage and the Cybor,”http://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1052&context=art\_design\_theses)//LC

In similar fashion, Shabot also finds problematic the hyper-sexualized body found in popular versions of female cyborgs. This body is configured as an ideal body type in its hyper- reality. Consequently, she expresses concern that the cyborg body, as popularly configured, risks abandoning the “flesh and blood body.”86 Shabot sees this loss as tantamount to a loss of embodied existence. She places great emphasis on the need to retain an embodied subject, for to lose the experience of our bodies is to lose the very difference that our own meaningful life experiences and sensations impart: “We are ... ambiguous beings regarding our ways of existing: our gender, our looks and our thoughts, constitute an ever-changing flux that can never be absolutely defined or contained by an abstract, purely conceptual, incorporeal subjectivity.”87 Shabot finds the tendency toward a disembodied subjectivity in popular images of cyborgs dangerous in the way that such an abstraction can appear impartial while upholding traditional hierarchies, conceptions, and dualisms. Drawing on Mikhail Bakhtin, Shabot offers the grotesque and monstrous body as an alternate figure to the cyborg.88 She argues that the grotesque body cannot be disembodied. In many ways, the grotesque body is actually defined and identified through the physical body. It is excessive, unable to be contained, closed, or limited—a self-transgressing, fragmented figure intertwined and interlaced with the world around it.89 However, Shabot does not suggest the grotesque as a means to evade technology and its impact on the body, which she recognizes as nearly impossible to avoid. Today, the cyborg seems almost inescapable, which highlights the cogency of her insistence on foregrounding the embodied subjective position and, thus, partial and imperfect subjectivities. The disconnection between Haraway’s cyborgs and popularized versions of them underscores the ways in which cyborgs as metaphors and oppositional figurations can lose their radical potential when co-opted by mass culture but also the ways in which Haraway has been misinterpreted. While Balsamo’s and Shabot’s points are certainly important, their critiques of the cyborg stem more from their wariness of its popularized images than those Haraway envisions or advocates. Yet Haraway’s own comments on the cyborg are admittedly confusing when taken out of context. Within the broader perspective of her writings, the cyborg is only one of the figurations within her “menagerie,” which includes monsters, tricksters, and vampires. Through Shabot’s arguments we are reminded that the radical cyborg, if it is to be an oppositional figure, carries with it the specter of the grotesque and monstrous. Haraway does not disagree. She speaks of the cyborg as a monstrous entity, especially to the extent that it has defined the very limits of Western imagination.90 Haraway’s cyborg is neither an innocent nor unified subject.91 It is an argument against dualisms of all kinds, including machine/organism, human/animal, natural/artificial, mind/body, and female/male, to name a few. According to Haraway, “cyborg imagery can suggest a way out of the dualism in which we have explained our bodies and our tools to ourselves.”92 This statement, along with her essay “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective,” offers a more nuanced interpretation of her perhaps initially misleading comment that cyborgs inhabit a post- gendered world. Haraway’s cyborg is not the disembodied cyborg of popular culture that Shabot indicts, nor is her post-gendered cyborg world one that privileges disembodied subjects freed from the specificity of a body. For Haraway, that type of positionality offers only a “false vision promising transcendence of all limits and responsibilities.”93 In contrast, in its commitment to permanent partiality, her cyborg is more akin to the “split and contradictory self.” It is “the one who can interrogate positioning and be accountable, the one who can construct and join rational conversations and fantastic imaginings that change history.”94 Haraway’s cyborg thus departs from those popular science-fiction and cyberpunk versions that fetishize the cyborg body as an escape from the limitations of the human body.95 Haraway’s radicalized cyborg pushes us to rethink our bodies and imagine new kinds of embodiment but also to examine our kinship and connections to what was formerly outside or beyond these bodies.96 As Haraway states, “the cyborg is in this curious set of family relationships with sibling species of various kinds” and with the inorganic and mechanical as well.97

#### Cyborgs fail to break down gender stereotypes

Smith ‘9- MA art and design at GSU (Nicole R., 12-01, “Wangechi Mutu: Feminist Collage and the Cybor,”http://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1052&context=art\_design\_theses)//LC

Though Haraway’s ironic political myth of the cyborg remains a powerful metaphor in feminist studies, critical assessments of it provide further suggestions on the most productive ways to consider feminist cyborg figurations. In one of the better-known critical assessments of the cyborg, Anne Balsamo offers an ironic ethnographic reading. Balsamo follows Haraway’s lead in reading the cyborg as a figure that can potentially disrupt concepts of the “other” in terms of human/machine and natural/artificial binaries.82 However, Balsamo finds that the cyborg of popular culture does not completely follow through on this disruptive promise in terms of gender binaries. She points out that popularized versions of cyborgs in literature and film do not exist in a post-gendered or utopian world but are instead highly gendered entities. On the one hand, female-gendered cyborgs, as fusions of the female with machines and technology, challenge traditional gender assumptions due to the way femininity has historically been associated with the emotional or sexual, as masculinity has with the rational, scientific, and technological. Yet according to Balsamo, “female cyborgs, while challenging the relationship between femaleness and technology, actually perpetuate oppressive gender stereotypes.”83 Balsamo singles out Rachel in Ridley Scott’s Blade Runner and Helva in Anne McCaffrey’s science-fiction novel The Ship that Sang as examples of how popular images of cyborgs reinforce the feminine as emotional, nurturing, or sexually objectified.84 Sara Cohen Shabot adds William Gibson’s cyberpunk novels and the films Robocop, The Terminator, and Total Recall as examples that further entrench normative views on male and female gendered identities.85 Ultimately, both Balsamo and Shabot argue that the cyborg of popular culture falls short of Haraway’s vision of the cyborg as a figure capable of subverting patriarchal power structures and essentializing views on gender.

#### Their defense the cyborg reflects a universalizing Western mythologization of neutrality and identity that props up colonization

Schueller 05 [Malini Johar. "Analogy and (white) feminist theory: Thinking race and the color of the cyborg body." Signs: Journal of Women in Culture and Society 31.1 (2005): 63-92.]

I point to the similarities between Haraway’s cyborg theory and theories of several other poststructuralists in order to suggest that there is nothing inherently subversive for feminism about such theorizing unless the theory can be shown to have specific, material, and located ramifications (a fact Haraway seems to have partially recognized in Modest\_Witness [1997a], which I will briefly discuss at the end of this essay). Indeed, as Susan Bordo suggests, **the epistemological jouissance suggested by the image of the cyborg denies locatedness and fantasizes itself as a postmodern “dream of everywhere”** (1990, 136, 144–45).10 Here it is important to distinguish between locatedness and a simple celebration of the local as endless possibility. I am not advocating what Manuel Castells (1997) describes as a defensive and retrenched localism (manifested most disturbingly in the “not in my backyard” ideal) in the face of globalization as a basis for feminist identity but rather a relationship to materiality and sociopolitical specificity as a basis for theorizing, much in the manner of Castells’s own analyses (1997, 61–62). In arguing for a relationship to locatedness, I am taking a stance about critical responsibility in a postcolonial world. As third-world environmentalists such as Vandana Shiva (1997) and subaltern studies historians have demonstrated, **policies and political concepts of postcolonial nations cannot be understood through universal** (read: Western) **concepts alone, even though local concepts need to be related to the global.** Witness Shiva’s call for international legal ecological policies based on an understanding of indigenous knowledges and Partha Chatterjee’s (1986) critique of the Western idea of nation as inapplicable to postcolonial countries. In the United States, **critical race theorists have argued for what legal theorist Richard Delgado** (1995) **terms the call to context, which challenges the traditional juridical preference for universalism over particularism and abstract principles over perspectivism.** This is particularly important, Delgado points out, in normative discourse such as civil rights (1995, xv). **Feminists and gender theorists might simply repeat the universalizing knowledge claims of colonialism by celebrating an ahistorical and acontextual blurring of boundaries**. For instance, might the blurring of racial boundaries be an obfuscation of the systemic racial oppression and racial hierarchies that continue to affect women’s lives? I will return to this point shortly, but for the moment I want to suggest that **neocolonial and imperial knowledge claims can be contested only through theories derived from located knowledge.** Indeed, my own arguments for context-specific theory derive in part from Haraway’s own paradigm of situated knowledge. Positing an alternative to a value-free relativism that she declares to be the “perfect mirror twin of totalization” (1988, 584), Haraway suggests an alternative that is “partial, locatable, critical knowledg[e] sustaining the possibility of webs of connections called solidarity in politics and shared conversations in epistemology” (584). “Our problem is how to have simultaneously an account of radical historical contingency for all knowledge claims and knowing subjects, a critical practice for recognizing our own ‘semiotic technologies’ for making meanings, and a nononsense commitment to faithful accounts of a ‘real’ world, one that can be partially shared” (579). It is in the spirit of Haraway’s own call for partial and locatable knowledge that I propose to examine the relationship between Haraway’s concept of the cyborg and the women of color who figure so prominently in the essay. Such an analysis will also reveal the problematic nature of the concept of woman of color as used by Haraway. I have already mentioned the overly celebratory nature of Haraway’s cyborg myth as a means of resisting the domination of a thoroughly technologized information culture and as a description of that culture. Haraway writes, “By the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism: in short, we are cyborg. The cyborg is our ontology; it gives us our politics. . . . This chapter is an argument for pleasure in the confusion of boundaries and for responsibility in their construction” (1991, 150). **The cyborg enables a productive blurring of the binaries such as male/female, self/other, and culture/nature that have sustained Western cultural hierarchies**. Just as the cyborg provides the means whereby to resist repressive dichotomies through unnatural fusions and illegitimate couplings, Haraway suggests that the political constituency of women of color provides a means of constructing a political solidarity out of coalition and affinity rather than out of essential identity. **Unlike identities based on sameness or unity, this postmodern identity is premised on “otherness, difference, and specificity”** (Haraway 1991, 155). Chela Sandoval’s (1984) model of oppositional consciousness, which suggests a mode of articulation seized by those denied stable identities of race or gender, demonstrates to Haraway the subversive potential of the coalition of women of color (1991, 174). Thus **women of color becomes for Haraway a cyborg identity**, “a potent subjectivity **synthesized from fusions of outsider identities**” (1991, 174). By the end of the essay, the analogous relationship of women of color to the illegitimate and hybrid fusion of the cyborg is clear. Haraway moves to delineate aspects of the cyborg myth by looking at “two overlapping groups of texts . . . constructions of women of color and monstrous selves in feminist science fiction” (1991, 174). What follows are illustrations of subversive political identities formulated by women of color such as Audre Lorde and Cherrı´e Moraga and feminist science fiction writers such as Joanna Russ, Samuel R. Delaney, James Tiptree Jr., Octavia Butler, and Vonda McIntyre. Following a partial trajectory of Haraway’s complex essay still leaves us with a few nagging questions: Why are women of color needed in order to formulate a cyborg myth centrally based on the monstrous fusion of human and machine? Who are the women of color referred to in the essay? Let us attempt to answer the second question first. Clearly the term women of color (it usually appears in quotation marks in the essay) alludes to radical African American, Latina, Native American, and Asian American feminists who constituted themselves as a group apart from white U.S. feminists. Sandoval’s (1984) formulation of oppositional consciousness, which Haraway cites, was preceded by the formation of Kitchen Table/ Women of Color Press and the publication of the influential anthology This Bridge Called My Back: Writings by Radical Women of Color, edited by Moraga and by Gloria Anzaldu´a in 1981. Subsequently, the term women of color gained widespread critical and pedagogical usage. Let us now see how Haraway explains the first question raised above. Haraway sees the writings of women of color as postmodern resistance writing or cyborg writing. Like all colonized groups, women of color seize the power to write in order to resignify hegemonic Western myths: “The poetry and stories of US women of color are repeatedly about writing, about access to the power to signify; but this time that power must be neither phallic nor innocent. . . . Cyborg writing is about the power to survive, not on the basis of original innocence, but on the basis of seizing the tools to mark the world that marked them as other. . . . Figuratively and literally, language politics pervade the struggles of women of color” (Haraway 1991, 175). Haraway’s claims for the writings of women of color are similar to the arguments of scholars who see minority writing or postcolonial writing as resistance writing alone. However, **such an argument not only reifies the very binaries of center and margin, colonizer and colonized, that Haraway as poststructuralist wishes to blur but also homogenizes, through a colonial imperative, the margin itself, a tactic strongly critiqued** by feminists like Chandra Talpade Mohanty (1991, 51). Let us revisit, for a moment, the two groups of texts Haraway compares: constructions of women of color and monstrous selves in feminist science fiction. One includes a variety of texts (presumably including autobiographies, novels, poetry, and drama) by a racially marked group, while the other deals with grotesque bodies in a specific genre. One would be hardpressed to find similar generalizations about white U.S. women’s writings, but women of color become fair game here, as did all third-world texts in Fredric Jameson’s much contested claim about these texts being national allegories (1986). Here I would argue in similar fashion to Aijaz Ahmed ([1987] 1992) that many texts by women of color are not about access to the power to signify or about subverting either the central origin myths of Western culture or myths of original innocence. Texts like Jade Snow Wong’s Fifth Chinese Daughter ([1950] 1989), Le Ly Hayslip’s When Heaven and Earth Changed Places (1989), and Bharati Mukherjee’s Jasmine (1989), for instance, affirm to an extent the binaries of Western rationality, modernity, and progress and Eastern irrationality, prejudice, and backwardness. Furthermore, the very assumption that texts by U.S. women of color are centrally about subverting Western myths suggests that minority texts are significant only insofar as they relate to the center. Many texts by U.S. women of color—Toni Morrison’s Beloved (1987) and Fae Myenne Ng’s Bone (1993) are powerful examples—are not fundamentally about subverting Western myths. And simply to suggest that writings about women of color are “repeatedly about writing” is simply to reiterate the discursive postmodern truism that all fiction is metafiction. Moreover, the very distinction between women of color and feminist science fiction writers begs the obvious question: Is Butler (who is included in the category of feminist science fiction) not a woman of color?

#### The identitarian 1+1=? mathematics of the cyborg leaves identity unchanged and limits the possibility for radical change.

Currier 03 [Dianne. "Feminist technological futures: Deleuze and body/technology assemblages." Feminist Theory 4.3 (2003): 321-338.]

While **the figure of the cyborg**, and the manifesto in general, have done much to propel feminist scholarship into a creative engagement with questions of technology and subjectivity, I would argue that it ultimately **fails to make the break with the logic of identity** which Haraway rightly identifies as crucial. This is apparent in one aspect of the cyborg’s ætiology – the intersection of bodies and technologies. **The seamless intermingling of bodies and technologies**, enabled by the common coding of each as information, **is central** to the figure of the cyborg. For Haraway, it is the cyborg, as the product of these intersections, that defies classification as organic or nonorganic, human or machine. However, as Kirby (1997) suggests, what remains problematic is that **in order to fabricate the hybrid and intermingled cyborg one must first begin with the discrete component entities which are precisely those elaborated within the logic of identity.** That is, in the construction of a cyborg, technologies are added to impact upon, and at some point intersect with a discrete, non-technological ‘body’. **While a limitless range of mutations and variations might emerge** from such meetings, I would, however, argue that **to proceed on the basis of an engagement between bodies and technologies which is primarily prosthetic**, as Kirby points out, **effectively reinscribes the cyborg into the binary logic of identity** which Haraway hopes to circumvent. Within Haraway’s work **in the formulation of the cyborg a body pre-exists as a singular entity, to which a range of technological artifacts and/or processes are appended, which then reformulate that body and its associated identity beyond the bounds of conventional categories of Human or Man.** **Tools are applied to bodies** – ‘communications technologies and biotechnologies are the crucial tools recrafting our bodies’ (Haraway, 1991: 164) – **in a formula that posits them as initially discrete categories**. Thus, **in so far as the hybrid cyborg is forged in the intermeshing of technology with a body, in a process of addition, it leaves largely intact those two categories** – (human) body and technology – **that preceded the conjunction.** **Haraway’s ‘disassembled and reassembled’ recipe for cyborg graftings is utterly dependent on the calculus of one plus one, the logic wherein pre-existent identities are then conjoined and melded. The cyborg’s chimerical complications are therefore never so promiscuous that its parts cannot be separated even if only retrospectively.** (Kirby, 1997: 147) This original demarcation of the components of the hybrid functionally reinstates the human, grounded in an non-technological organic body as a stable site that cannot be retrospectively conjured away by a subsequent seamless interface of shared coding. In proposing the cyborg as hybrid, Haraway reiterates precisely the categorical demarcation of human and machine she is attempting to dissolve. And the logic through which those categories are articulated in a relation of binary opposition to each other remains. **Thus the cyborg is framed as different from the preceding forms of Human bodies and nonhuman technologies which give rise to it. Its difference is accounted for as variation or mutation, that is in a relation to a central figure, the Human, in a reiteration of the logic of identity.** That the logic of identity is problematic for feminist theory on a range of fronts has been convincingly and comprehensively argued elsewhere.1 I would argue that these difficulties are especially acute for feminists such as Haraway who are interested in re-conceptualizing technology as a facilitating agent for new and transformed futures. Not only does the logic of identity erase difference, including sexual difference, but to the extent that it is a deterministic framework it forecloses any possibility of radical and unexpected change. As Grosz (2000) has argued, the ability to think the new requires an open-ended, non-deterministic conceptual horizon within which the unpredictable and unexpected, the novel may appear and in which the future is not already predicted and determined in a relation to the past/present. Such a horizon must not be bound by determination, in which all emergent formations are explained in relation to existing ones, but must instead accommodate the ‘disconcerting idea of unpredictable transformation, upheavals in directions and arenas which cannot be known in advance and whose results are inherently uncertain’ (Grosz, 2000: 215). To think radical transformation, then, requires a conceptual horizon that will allow for the emergence of novelty, innovation or radical change – the new.2 Clearly a logic such as that of identity, where difference is always already situated in relation to the same, circumscribes the appearance of the new and radically different. **As long as bodies and technologies are thought through only the determinist framework of identity, their combination cannot give rise to radically transformed new configurations**. In the last instance, any mutant formation remains articulated within the dominant framework and its difference understood only in relation to the forms – human and technological – that preceded it. Transformation is short-circuited in a formulation in which emerging configurations are explicable only in terms of difference from preceding forms and, thus, articulated in relation to the same. Given the many disclaimers to the contrary, it is ironic that the cyborg is perhaps the most recent of Cartesian recuperations. Haraway’s insistence that ‘the cyborg skips the step of original unity’ forgets that it is against the unity of ‘the before’, the purity of identity prior to its corruption, that the cyborg’s’ unique and complex hybridity is defined. (Kirby, 1997: 147)

#### There is zero empirical basis for psychoanalysis – their authors either grossly misrepresent empirical data or hubristically extrapolate single events into broad theories – also Lacan was a cult leader

Paris 17 [Dr Paris is Professor, Department of Psychiatry, McGill University, and Research Associate, Department of Psychiatry, Jewish General Hospital. "Is Psychoanalysis Still Relevant to Psychiatry?" https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5459228/]

In an era in which psychiatry is dominated by neuroscience-based models, psychological constructs tend to be neglected and may be taken seriously only when they have neural correlates.37 Some psychoanalysts have sought to link their model with neurobiological research and to claim that newer methods of studying the brain can validate their theories.5,6

Mark Solms, a South African neuropsychologist, is the founder of “neuropsychoanalysis.” This new field, with its own society and its own journal, proposes to use neuroimaging to confirm analytic theories. Its key idea is that subjective experience and the unconscious mind can be observed through neuroimaging.5 It is known that brain processes can be seen on brain imaging even before they have entered consciousness.38 However, claims that neuroimaging validate Freud’s model of the unconscious can be based only on “cherry-picking” the literature. The observed correspondences are superficial and hardly support the complex edifice of psychoanalytic theory.

Solms39 has also suggested that Freud’s ideas about dreams are consistent with neuroscience research based on rapid eye movement (REM) activity. This attempt to rescue a century-old theory met with opposition from dream researchers who consider Freud’s clinical speculations to be incompatible with empirical data.40,41

The proposal to establish a discipline of neuropsychoanalysis also met with a mixed reception from traditional psychoanalysts, who did not want to dilute Freud’s wine with neuroscientific water.42 Neuroscientists, who are more likely to see links to psychology as lying in cognitive science,43 have ignored this idea. In summary, neuropsychoanalysis is being used a way to justify long-standing models, without attempting to find something new or to develop an integration of perspectives on psychology.

However, Eric Kandel,44 influential in the light of his Nobel Prize for the study of the neurochemistry of memory, has taken a sympathetic view of the use of biological methods to study psychoanalytic theory. Kandel had wanted to be an analyst before becoming a neuroscientist.45 But Kandel, who does not actively practice psychiatry, may be caught in a time warp, unaware that psychoanalysis has been overtaken by competitors in the field of psychotherapy.

Another attempt to reconcile psychoanalysis with science has come from the literature on neuroplasticity.46 It is now known that neurogenesis occurs in some brain regions (particularly the hippocampus) during adulthood and that neural connections undergo modification in all parts of the brain. There is also evidence that CBT can produce brain changes that are visible using imaging.47 These findings have not been confirmed in psychoanalytic therapies. However, Norman Doidge, a Canadian psychoanalyst, has argued that psychoanalysis can change the brain.48 This may be the case for all psychotherapies. However, more recently, Doidge49 has claimed that mental exercises can reverse the course of severe neurological and psychiatric problems, including chronic pain, stroke, multiple sclerosis, Parkinson’s disease, and autism. While these books have been best-sellers, most of their ideas in the second volume,49 based on anecdotes rather than on clinical trials, have had little impact in medicine. This story underscores the difficulty of reconciling the perspectives and methods of psychoanalysis with scientific methods based on empirical testing.

Psychoanalysis and the Humanities

Psychoanalysis claimed to be a science but did not function like one. It failed to operationalize its hypotheses, to test them with empirical methods, or to remove constructs that failed to gain scientific support.1 In this way, the intellectual world of psychoanalysis more closely resembles the humanities. Today, with few psychiatrists or clinical psychologists entering psychoanalytic training, the door has been opened to practitioners with backgrounds in other disciplines, including the humanities.

This trend is related to a hermeneutic mode of thought,50 which focuses on meaningful interpretations of phenomena, rather than on empirical testing of hypotheses and observations. Since the time of Freud, the typical psychoanalytic paper has consisted of speculations backed up with illustrations, similar to the methods of literary theory and criticism.

One model currently popular in the humanities is “critical theory.”51 This postmodernist approach uses Marxist concepts to explain phenomena ranging from literature to politics. It proposes that truth is entirely relative and often governed by hidden social forces. In its most radical form, in the work of Michel Foucault,52 critical theory and postmodernism take an antiscience position, denying the existence of objective truth and viewing scientific findings as ways of defending the “hegemony” of those in power.

Some humanist scholars have adopted the ideas of Jacques Lacan, a French psychoanalyst who created his own movement and whose eccentric clinical practice resembled that of a cult leader.53 Moreover, recruitment of professionals and academics with no training in science could lead to an increasing isolation of the discipline. While only a few contemporary psychoanalysts have embraced postmodernism, the humanities have made use of psychoanalytical concepts for their own purposes as a way of understanding literature and history.

## Util

#### Util good – Existential threats outweigh.

**GPP 17** (Global Priorities Project, Future of Humanity Institute at the University of Oxford, Ministry for Foreign Affairs of Finland, “Existential Risk: Diplomacy and Governance,” Global Priorities Project, 2017, <https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf>

1.2. THE ETHICS OF EXISTENTIAL RISK In his book Reasons and Persons, Oxford philosopher Derek Parfit advanced an influential argument about the importance of avoiding extinction: I believe that if we destroy mankind, as we now can, this outcome will be much worse than most people think. Compare three outcomes: (1) Peace. (2) A nuclear war that kills 99% of the world’s existing population. (3) A nuclear war that kills 100%. (2) would be worse than (1), and (3) would be worse than (2). Which is the greater of these two differences? Most people believe that the greater difference is between (1) and (2). I believe that the difference between (2) and (3) is very much greater**. ...** The Earth will remain habitable for at least another billion years. Civilization began only a few thousand years ago. If we do not destroy mankind, these few thousand years may be only a tiny fraction of the whole of civilized human history. The difference between (2) and (3) may thus be the difference between this tiny fraction and all of the rest of this history. If we compare this possible history to a day, what has occurred so far is only a fraction of a second.65 In this argument, it seems that Parfit is assuming that the survivors of a nuclear war that kills 99% of the population would eventually be able to recover civilisation without long-term effect. As we have seen, this may not be a safe assumption – but for the purposes of this thought experiment, the point stands. What makes existential catastrophes especially bad is that they would “destroy the future,” as another Oxford philosopher, Nick Bostrom, puts it.66 This future could potentially be extremely long and full of flourishing, and would therefore have extremely large value. In standard risk analysis, when working out how to respond to risk, we work out the expected value of risk reduction, by weighing the probability that an action will prevent an adverse event against the severity of the event. Because the value of preventing existential catastrophe is so vast, even a tiny probability of prevention has huge expected value.67 Of course, there is persisting reasonable disagreement about ethics and there are a number of ways one might resist this conclusion.68 Therefore, it would be unjustified to be overconfident in Parfit and Bostrom’s argument. In some areas, government policy does give significant weight to future generations. For example, in assessing the risks of nuclear waste storage, governments have considered timeframes of thousands, hundreds of thousands, and even a million years.69 Justifications for this policy usually appeal to principles of intergenerational equity according to which future generations ought to get as much protection as current generations.70 Similarly, widely accepted norms of sustainable development require development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs.71 However, when it comes to existential risk, it would seem that we fail to live up to principles of intergenerational equity. Existential catastrophe would not only give future generations less than the current generations; it would give them nothing. Indeed, reducing existential risk plausibly has a quite low cost for us in comparison with the huge expected value it has for future generations. In spite of this, relatively little is done to reduce existential risk. Unless we give up on norms of intergenerational equity, they give us a strong case for significantly increasing our efforts to reduce existential risks. 1.3. WHY EXISTENTIAL RISKS MAY BE SYSTEMATICALLY UNDERINVESTED IN, AND THE ROLE OF THE INTERNATIONAL COMMUNITY In spite of the importance of existential risk reduction, it probably receives less attention than is warranted. As a result, concerted international cooperation is required if we are to receive adequate protection from existential risks. 1.3.1. Why existential risks are likely to be underinvested in There are several reasons why existential risk reduction is likely to be underinvested in.Firstly, it is a global public good. Economic theory predicts that such goods tend to be underprovided.The benefits of existential risk reduction are widely and indivisibly dispersed around the globe from the countries responsible for taking action. Consequently, a country which reduces existential risk gains only a small portion of the benefits but bears the full brunt of the costs. Countries thus have strong incentives to free ride, receiving the benefits of risk reduction without contributing. As a result, too few do what is in the common interest. Secondly, as already suggested above, existential risk reduction is an intergenerational public good: most of the benefits are enjoyed by future generations who have no say in the political process. For these goods, the problem is temporal free riding: the current generation enjoys the benefits of inaction while future generations bear the costs. Thirdly, many existential risks, such as machine superintelligence, engineered pandemics, and solar geoengineering, pose an unprecedented and uncertain future threat. Consequently, it is hard to develop a satisfactory governance regime for them: there are few existing governance instruments which can be applied to these risks, and it is unclear what shape new instruments should take. In this way, our position with regard to these emerging risks is comparable to the one we faced when nuclear weapons first became available. Cognitive biases also lead people to underestimate existential risks.Since there have not been any catastrophes of this magnitude, these risks are not salient to politicians and the public.72 This is an example of the misapplication of the availability heuristic, a mental shortcut which assumes that something is important only if it can be readily recalled. Another cognitive bias affecting perceptions of existential risk is scope neglect. In a seminal 1992 study, three groups were asked how much they would be willing to pay to save 2,000, 20,000 or 200,000 birds from drowning in uncovered oil ponds. The groups answered $80, $78, and $88, respectively.73 In this case, the size of the benefits had little effect on the scale of the preferred response. People become numbed to the effect of saving lives when the numbers get too large. **74** Scope neglect is a particularly acute problem for existential risk because the numbers at stake are so large.Due to scope neglect, decision-makers are prone to treat existential risks in a similar way to problems which are less severe by many orders of magnitude.A wide range of other cognitive biases

#### Consequences first — anything else is irresponsible and escapes valuable discussions.

**Bracey 06** (Christopher A. Bracey 6, Associate Professor of Law, Associate Professor of African & African American Studies, Washington University in St. Louis, September, Southern California Law Review, 79 S. Cal. L. Rev. 1231, p. 1318)

Second, reducing conversation on race matters to an ideological contest allows opponents to elide inquiry into whether the results of a particular preference policy are desirable. Policy positions masquerading as principled ideological stances create the impression that a racial policy is not simply a choice among available alternatives, but the embodiment of some higher moral principle. Thus, the "principle" becomes an end in itself, without reference to outcomes. Consider the prevailing view of colorblindness in constitutional discourse. Colorblindness has come to be understood as the embodiment of what is morally just, independent of its actual effect upon the lives of racial minorities. This explains Justice Thomas's belief in the "moral and constitutional equivalence" between Jim Crow laws and race preferences, and his tragic assertion that "Government cannot make us equal [but] can only recognize, respect, and protect us as equal before the law." [281](http://web.lexis-nexis.com/universe/document?_m=cd9713b340d60abd42c2b34c36d8ef95&_docnum=9&wchp=dGLbVzz-zSkVA&_md5=9645fa92f5740655bdc1c9ae7c82b328) For Thomas, there is no meaningful difference between laws designed to entrench racial subordination and those designed to alleviate conditions of oppression. Critics may point out that colorblindness in practice has the effect of entrenching existing racial disparities in health, wealth, and society. But in framing the debate in purely ideological terms, opponents are able to avoid the contentious issue of outcomes and make viability determinations based exclusively on whether racially progressive measures exude fidelity to the ideological principle of colorblindness. Meaningful policy debate is replaced by ideological exchange, which further exacerbates hostilities and deepens the cycle of resentment.

## Cap Good

**Carbon capture is necessary to reach emissions targets – we’ve gone past core tipping points and legitimately can’t decarbonize in time absent CCS**

**Moniz 19** - 13th Secretary of Energy (2013 to 2017) and is the founder and CEO of the Energy Futures Initiative (Fredd Krupp is president of the Environmental Defense Fund, Ernest Moniz, “Cutting Climate Pollution Isn’t Enough — We Also Need Carbon Removal,” Text, TheHill, September 23, 2019, <https://thehill.com/opinion/energy-environment/462609-cutting-climate-pollution-isnt-enough-we-also-need-carbon-removal>)

It has been almost four years since the Paris climate agreement was signed. But as leaders gather in New York this week for the United Nations Climate Change Summit, **the world remains far off track from meeting the Paris objective of limiting global warming to well below 2 degrees Celsius** -- and pursuing efforts at 1.5 degrees. **To meet that target, the world must achieve a 100 percent clean economy** — one that produces net zero emissions, or no more climate pollution than can be removed from the atmosphere — soon after mid-century, with the United States and other advanced economies reaching that milestone **no later than 2050.** It’s a daunting but doable task. The consequences of falling short are enormous. This year, the U.S. government’s fourth National Climate Assessment documented the huge economic and social impacts of unchecked warming. The Pentagon has repeatedly warned of the impacts on national security and our troops. Achieving a 100 percent clean economy will require a swift transition to renewables and other zero-carbon energy sources. But **we also need to face the reality that meeting the Paris target will require taking carbon out of the atmosphere at massive scale.** In part, that’s because **eliminating emissions will be very challenging for some sectors, especially the transportation industry and agriculture. Removing carbon from the atmosphere would also bring concentrations down, helping to stabilize the climate at safer levels.** So, the push for clean energy must be supplemented by a suite of technologies known as carbon dioxide removal (CDR). It is not a question of what we’d prefer. It’s a question of insurmountable math. The crucial role carbon removal must play is becoming more widely recognized. **The 2018 Intergovernmental Panel on Climate Change report stressed the importance of carbon removal, and the U.S. National Academies of Sciences, Engineering and Medicine late last year estimated that ten billion tons of CO2 will need to be pulled from the atmosphere annually by 2050, and double that by 2100.** For context, today’s global emissions are less than 40 billion tons per year. **If the 10 billion tons of CO2 from CDR were stored underground, that would be roughly double the world’s annual oil production.** The good news is that **there are a surprisingly large number of promising pathways for carbon dioxide removal**

**Tech innovation and profit motives drive the Second Machine Age, which dematerializes capitalism and makes growth sustainable.**

**McAfee, 19**—cofounder and codirector of the MIT Initiative on the Digital Economy at the MIT Sloan School of Management, former professor at Harvard Business School and fellow at Harvard’s Berkman Center for Internet and Society (Andrew, “Looking Ahead: The World Cleanses Itself This Way,” *More from Less: The Surprising Story of How We Learned to Prosper Using Fewer Resources—and What Happens Next*, Chapter 14, pg 278-292, Kindle, dml)

**The decreases in resource use, pollution, and other exploitations of the earth** cataloged in the preceding chapters **are great news. But are they going to last? It could be that we're just living in a pleasant interlude between the Industrial Era and another** rapacious **period during which we massively increase our footprint on our planet and** eventually **cause a giant Malthusian crash**.

It could be, but **I don't think so**. Instead, I think **we're going to take better care of our planet from now on**. I'm confident that **the Second Machine Age will mark the time in our history when we started to progressively and permanently tread more lightly on the earth, taking less from it and generally caring for it better, even as we humans continue to become more numerous and prosperous**. The work of Paul Romer, who shared the 2018 Nobel Prize in economics, is one of the sources of this confidence.

Growth Mindset

Romer's largest contribution to economics was to show that it's best not to think of new technologies as something that companies buy and bring in from the outside, but instead as something they create themselves (the title of his most famous paper, published in 1990, is "Endogenous Technological Change"). These **technologies are like designs or recipes**; as Romer put it, they’re "**the instructions that we follow for combining raw materials**." This is close to the definitions of technology presented in chapter 7.

**Why do companies invent and improve technologies?** Simply, **to generate profits. They come up with instructions, recipes, and blueprints that will let them grow revenues or shrink costs**. As we saw repeatedly in chapter 7, **capitalism provides ample incentive for this kind of tech progress**.

So far, all this seems like a pretty standard argument for how the first two horsemen work together. Romer's brilliance was to highlight the importance of two key attributes of the **technological ideas** companies come up with as they pursue profits. The first is that **they're nonrival**, meaning that **they can be used by more than one person or company at a time, and that they don't get used up**. This is obviously not the case for most resources made out of atoms—I can't also use the pound of steel that you've just incorporated into the engine of a car—but it is the case for ideas and instructions. The Pythagorean theorem, a design for a steam engine, and a recipe for delicious chocolate chip cookies aren't ever going to get "used up" no matter how much they're used.

The second important aspect of corporate technologies is that **they're partially excludable**. This means that companies can kind of prevent others from using them. They do this by keeping the technologies secret (such as the exact recipe for Coca-Cola), filing for patents and other intellectual-property protection, and so on. However, none of these measures is perfect (hence the words partially and kind of). Trade secrets leak. Patents expire, and even before they expire, they must describe the invention they're claiming and so let others study it.

**Partial excludability** is a beautiful thing. It **provides strong incentives for companies to create useful, profit-enhancing new technologies** that they alone can benefit from for a time, **yet it also ensures that the new techs will eventually "spill over"—that with time they’ll diffuse and get adopted by more and more companies**, even if that's not what their originators want.

Romer equated tech progress to the production by companies of nonrivalrous, partially excludable ideas and showed that **these ideas cause an economy to grow**. What's more, he also demonstrated that **this idea-fueled growth doesn't have to slow down with time. It's not constrained by the size of the labor force, the amount of natural resources, or other such factors**. Instead, **economic growth is limited only by the idea-generating capacity of the people within a market**. Romer called this capacity "human capital" and said at the end of his 1990 paper, "The most interesting positive implication of the model is that an economy with a larger total stock of human capital will experience faster growth."

This notion, which has come to be called **"increasing returns to scale," is as powerful as it is counterintuitive. Most formal models of economic growth**, as well as the informal mental ones most of us walk around with, **feature decreasing returns—growth slows down as the overall economy gets bigger. This makes intuitive sense**; it just feels like it would be easier to experience 5 percent growth in a $1 billion economy than a $1 trillion one. **But** Romer showed that as long **as that economy continued to add to its human capital—the overall ability of its people to come up with new technologies and put them to use—it could actually grow faster even as it grew bigger. This is because the stock of useful, nonrivalrous, nonexcludable ideas would keep growing**. As Romer convincingly showed, economies run and grow on ideas.

The Machinery of Prosperity

Romer's ideas should leave us optimistic about the planetary benefits of digital tools—hardware, software, and networks—for three main reasons. First, **countless examples show us how good** these tools are at fulfilling the central role of **technology**, which **is** to provide "instructions that we follow **for combining raw materials**." **Since raw materials cost money, profit-maximizing companies are particularly keen to find ways to use fewer of them**. So they use digital tools to come up with beer cans that use less aluminum, car engines that use less steel and less gas, mapping software that removes the need for paper atlases, and so on and so on. **None of this is done solely for the good of the earth—it's done for the pursuit of profit that's at the heart of capitalism—yet it benefits the planet by**, as we've seen, **causing us to take less from it**.

Digital tools are technologies for creating technologies, the most prolific and versatile ones we've ever come up with. They're machines for coming up with ideas. Lots of them. **The same piece of computer-aided design software can be used to create a thinner aluminum can or a lighter and more fuel-efficient engine. A drone can be used to scan farmland** to see if more irrigation is needed, **or to substitute for a helicopter** when filming a movie. **A smartphone can be used** to read the news, listen to music, and pay for things, all **without consuming a single extra molecule**.

In the Second Machine Age, **the global stock of digital tools is increasing much more quickly than ever before. It's being used in countless ways by profit-hungry companies to combine raw materials in ways that use fewer of them**. In advanced economies such as America's, **the cumulative impact of this combination of capitalism and tech progress is clear: absolute dematerialization of the economy and society, and thus a smaller footprint on our planet**.

The second way Romer's ideas about technology and growth are showing up at present is via decreased excludability. **Pervasive digital tools are making it much easier for good designs and recipes to spread around the world**. While this is often not what a company wants—it wants to exclude others from its great cost-saving idea— excludability is not as easy as it used to be.

This isn't because of weaker patent protection, but instead because of stronger digital tools. **Once one company shows what's possible, others use hardware, software, and networks to catch up to the leader. Even if they can't copy exactly** because of intellectual-property restrictions, **they can use digital tools to explore other means to the same end. So, many farmers learn to get higher yields while using less water and fertilizer, even though they combine these raw materials in different ways**. Steve Jobs would certainly have preferred for Apple to be the only provider of smartphones after it developed the iPhone, but he couldn't maintain the monopoly no matter how many patents and lawsuits he filed. Other companies found ways to combine processors, memory, sensors, a touch screen, and software into phones that satisfied billions of customers around the world.

The operating system that powers most non-Apple smartphones is Android, which is both free to use and freely modifiable. Google's parent company, Alphabet, developed and released Android without even trying to make it excludable; the explicit goal was to make it as widely imitable as possible. This is an example of the broad trend across digital industries of giving away valuable technologies for free.

The Linux operating system, of which Android is a descendant, is probably the best-known example of free and open-source software, but there are many others. The online software repository GitHub maintains that it's "the largest open source community in the world" and hosts millions of projects. The Arduino community does something similar for electronic hardware, and the Instructables website contains detailed instructions for making equipment ranging from air-particle counters to machine tools, all with no intellectual-property protection. Contributors to efforts such as these have a range of motivations (Alphabet's goals with Android were far from purely altruistic—among other things, the parent of Google wanted to achieve a quantum leap in mobile phone users around the world, who would avail themselves of Google Search and services such as YouTube), but they're all part of the trend of technology without excludability, which is great news for growth.

As we saw in chapter 10, **smartphone use and access to the Internet are increasing quickly across the planet. This means that people no longer need to be near a decent library or school to gain knowledge and improve their abilities. Globally, people are taking advantage of the skill-building opportunities of new technologies**. This is the third reason that the spread of digital tools should make us optimistic about future growth: **these tools are helping human capital grow quickly**.

The free Duolingo app, for example, is now the world's most popular way to learn a second language. Of the nearly 15 billion Wikipedia page views during July of 2018, half were in languages other than English. Google's chief economist, Hal Varian, points out that hundreds of millions of how-to videos are viewed every day on YouTube, saying, "We never had a technology before that could educate such a broad group of people anytime on an as-needed basis for free."

Romer's work leaves me hopeful because it shows that **it's our ability to build human capital, rather than chop down forests, dig mines, or burn fossil fuels that drives growth and prosperity**. His model of how economies grow also reinforces how well capitalism and tech progress work together, which is a central point of this book. **The surest way to boost profits is to cut costs, and modern technologies, especially digital ones, offer unlimited ways to combine and recombine materials—to swap, slim, optimize, and evaporate—in cost-reducing ways.** **There's no reason to expect that** the two horsemen of **capitalism and tech progress will stop** riding together **anytime soon. Quite the contrary**. Romer's insights reveal that **they're likely to gallop faster and farther as economies grow**.

Our Brighter, Lighter Future

**The world still has billions of desperately poor people, but they won't remain that way. All available evidence strongly suggests that most will become much wealthier in the years and decades ahead. As they earn more and consume more, what will be the impact on the planet?**

The **history** and economics of the Industrial Era **lead to pessimism** on this important question. **Resource use increased in lockstep with economic growth throughout** the two **centuries** between James Watt's demonstration of his steam engine and the first Earth Day. **Malthus and Jevons seemed to be right, and it was just a question of when, not if, we'd run up against the hard planetary limits to growth.**

**But** in America and other rich countries **something strange, unexpected, and wonderful happened: we started getting more from less. We decoupled population and economic growth from resource consumption, pollution, and other environmental harms. Malthus's and Jevons's ideas gave way** to Romer's, and the world will never be the same.

This means that **instead of worrying about the world's poor becoming richer, we should instead be helping them upgrade economically as much and as quickly as possible**. Not only is it the morally correct thing to do, **it's** also **the smart move for our planet. As today’s poor countries get richer, their institutions will improve and most will eventually go through** what Ricardo Hausmann calls "**the capitalist makeover of production**." **This makeover doesn't enslave people, nor does it befoul the earth**.

**As today’s poor get richer, they'll consume more, but they'll also consume much differently** from earlier generations. **They won't read physical newspapers and magazines. They'll get a great deal of their power from renewables and** (one hopes) **nuclear because these energy sources will be the cheapest**. They’ll live in cities, as we saw in chapter 12; in fact, they already are. **They'll be less likely to own cars** because a variety of transportation options will be only a few taps away. Most important, **they'll come up with ideas that keep the growth going, and that benefit both humanity and the planet we live on**.

Predicting exactly how technological progress will unfold is much like predicting the weather: feasible in the short term, but impossible over a longer time. **Great uncertainty and complexity prevent precise forecasts about**, for example, the **computing devices** we’ll be using thirty years from now **or the dominant types of a**rtificial **i**ntelligence in 2050 and beyond.

**But** even though we can't predict the weather long term, **we can accurately forecast** the climate. We know how much warmer and sunnier it will be on average in August than in January, for example, and we know that global average temperatures will rise as we keep adding greenhouse gases to the atmosphere. Similarly, we can predict **the "climate" of future technological progress by starting from the knowledge that it will be heavily applied in the areas where it can affect capitalism the most. As we've seen over and over, tech progress supplies opportunities to trim costs (and improve performance) via dematerialization, and capitalism provides the motive to do so**.

As a result, **the Second Enlightenment** will continue as we move deeper into the twenty-first century. I'm confident that it **will accelerate as digital technologies continue to improve and multiply and global competition continues to increase**. We’ll see some of the most striking examples of slim, swap, evaporate, and optimize in exactly the places where the opportunities are biggest. Here are a few broad predictions, spanning humanity's biggest industries.

Manufacturing. Complex parts will be made not by the techniques developed during the Industrial Era, but instead by three- dimensional printing. This is already the case for some rocket engines and other extremely expensive items. **As 3-D printing improves and becomes cheaper, it will spread to** automobile engine blocks, manifolds and other complicated arrangements of pipes, airplane struts and wings, and **countless other parts. Because 3-D printing generates virtually no waste and doesn't require massive molds, it accelerates dematerialization**.

**We'll also be building things out of very different materials** from what we're using today. **We're rapidly improving our ability to use machine learning and massive amounts of computing power to screen the huge number of molecules available in the world. Well use this ability to determine which substances would be best for making flexible solar panels, more efficient batteries, and other important equipment. Our search for the right materials to use has so far been slow and laborious. That's about to change**.

**So is our ability to understand nature's proteins, and to generate new ones**. All living things are made out of the large biomolecules known as proteins, as are wondrous materials such as spiders' silk. The cells in our bodies are assembly lines for proteins, but we currently understand little about how these assembly lines work—how they fold a two-dimensional string of amino acids into a complicated 3-D protein. But thanks to **digital tools**, we're learning quickly. In 2018, as part of a contest, the AlphaFold software developed by Google DeepMind correctly guessed the structure of twenty-five out of forty-three proteins it was shown; the second-place finisher guessed correctly three times. DeepMind cofounder Demis Hassabis says, "We [haven't] solved the protein-folding problem, this is just a first step... but we have a good system and we have a ton of ideas we haven't implemented yet." As these good ideas accumulate, they **might** well **let us make spider-strength materials**.

Energy. **One of humanity's most urgent tasks** in the twenty-first century **is to reduce greenhouse gas emissions. Two ways to do this are to become more efficient in using energy and, when generating it, to shift away from carbon-emitting fossil fuels. Digital tools will help greatly with both**.

**Several groups have recently shown that they can combine machine learning and other techniques to increase the energy efficiency of data centers by as much as 30 percent**. This large improvement matters for two reasons. First, **data centers are heavy users of energy**, accounting for about 1 percent of global electricity demand. So efficiencies in these facilities help. Second, and more important, **these gains indicate how much the energy use of all our other complicated infrastructures— everything from electricity grids to chemical plants to steel mills—can be trimmed. All are a great deal less energy efficient than they could be. We have both ample opportunity and ample incentive now to improve them.**

**Both wind and solar power are becoming much cheaper**, so much so that **in many parts of the world they're now the most cost-effective options**,