Transhumanism, The Singularity, and Technological Idolatry

Presentation to the Dorothy Day Catholic Worker D.C., May 5, 2023, commemorating the 90th anniversary of the Catholic Worker's founding and the 7th anniversary of Dan Berrigan's death

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Peter Maurin and Dorothy Day, Presente!

"For those who think that there is no hope for the future, no recognition of their plight,—this little paper is addressed.

It is printed to call their attention to the fact that the Catholic Church has a social program[.]"

CW Vol. I. No. 1 (May Day, 1933) page 4

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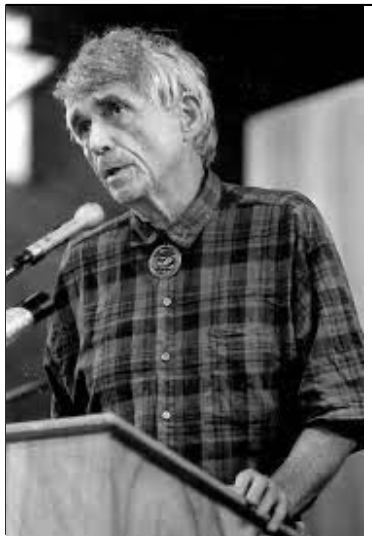

Dan Berrigan, Presente!

"**It is not true that we have to wait** for those who are specially gifted,
who are the prophets of the church, **before we can be peacemakers**.
This is true: **I will pour out my Spirit on all flesh**,
and your sons and daughters shall prophesy,
your young shall see visions,
and your old shall have dreams. . . .
So let us enter Advent in hope, even hope against hope.
Let us see visions of love and peace and justice."

Dan Berrigan, "Advent", in *Testimony, The Word Made Flesh* (Orbis 2004) 211

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Presentation Order

- What is Transhumanism, its stated aims, and its tenets
- Technologies transhumanists advocate
- The Pentagon's research and development of transhumanist technologies
- Critique of Transhumanism

Transhumanism: Expediting Human Evolution Through Bioengineering

- A philosophical and scientific movement that advocates enhancing human beings through the use of current and emerging technologies—such as genetic engineering, cryonics, artificial intelligence, and nanotechnology—to elevate humans to an exponentially greater step in evolutionary development called the "posthuman" state

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F.R. Rana & K.R. Samples, *Humans 2.0, Scientific: Philosophical, and Theological Perspectives on Transhumanism* 18, 194 (RTB Press 2019); Encyclopedia Britannica, "Transhumanism," available at https://www.britannica.com/topic/transhumanism.

James Hughes: Transhumanism Accomplished By Better Technology

"In the twenty-first century the **convergence of artificial intelligence, nanotechnology and genetic engineering** will allow human beings to achieve things previously imagined only in science fiction. **Life spans will extend** well beyond a century. **Our senses and cognition will be enhanced**. We will gain control over our emotions and memory. **We will merge with machines, and machines will become more like humans. These technologies will allow us to evolve into varieties of 'posthumans' and usher us into a 'transhuman' era and society** . . . Transhuman technologies, technologies that push the boundaries of humanness, can radically improve our quality of life."

James Hughes, *Citizen Cyborg* (Westview 2004), xii

Executive Director Institute for Ethics and Emerging Technologies

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Transhumanism Leads To The Posthuman

- Future beings whose basic capacities so radically exceed those of present humans as **to be no longer unambiguously human**
- "**Posthumans could be completely synthetic artificial intelligences, or they could be enhanced uploads, or they could be the result of making many smaller but cumulatively profound augmentations to a biological human.** The latter alternative would probably require either the **redesign of the human organism using advanced nanotechnology or its radical enhancement using some combination of technologies** such as genetic engineering, psychopharmacology, anti-aging therapies, neural interfaces, advanced information management tools, memory enhancing drugs, wearable computers, and cognitive techniques."

Nick Bostrom, Faculty of Philosophy, Oxford University

Nick Bostrom, *The Transhumanist FAQ* (V2.1) (2003)

7

Available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://nickbostrom.com/views/transhumanist.pdf.

Hans Moravec, adjunct faculty, Robotics Institute Carnegie Mellon University

The Posthuman Will Sweep Away The Human Race

"What awaits is not oblivion but rather **a future which**, from our present vantage point, is **best described by the words "postbiological" or even "supernatural." It is a world in which the human race has been swept away by a tide of cultural change, usurped by its own artificial progeny**. . . .

Within the next century [machines] will mature into entities as complex as ourselves, and eventually into something transcending everything we know . . . .

We humans will benefit for a time from their labors, but sooner of later, like natural children, [machines] will seek their own fortunes while **we, their aged parents, silently fade away.**"

Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence* (Harvard Univ. Press 1988) 1

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Transhumanism's Tenets

- Human potential: **humanity's biological state with its limitations does not reflect evolution's endpoint**. Human beings' condition can develop and change through the reasonable use of science and technology.
- Technological progress: **a new revolution in science and technology** involving genetic engineering, information technology, molecular nanotechnology, and artificial intelligence **will lead to greatly enhanced bodily functionality, increased intellectual capacity, and indefinite life span**.
- Human autonomy: atheist or agnostic outlook. **Humans are masters of their own fate** and, therefore, are free to pursue transformation through various advancement technologies.

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Humans 2.0, at 194-96.

Transhumanism's Tenets

- Posthuman transformation: The posthuman condition reflects a **transmutation where humans and intelligent technology will be increasingly intertwined and embodied.** For some transhumanists, the posthuman condition could reflect an **ultimate endgame of super-intelligent, immortal, seemingly godlike beings**.
- Naturalist worldview: the natural, material, and **physical universe is the only reality**.
- Secular humanism: **Rejecting belief in God, religion, and anything supernatural**, secular transhumanism embraces unguided biological evolution, scientism and materialism.
- Temporal values: **morals, values, and societal norms** find their justification in the **conventional agreement of humans** (e.g., utilitarianism, relativism, pragmatism)

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Humans 2.0, at 194-96.

Technologies Transhumanists Advocate

- Artificial Intelligence
- CRISPR genetic manipulation
- Brain Computer Interfaces
- Anti-Aging/Life Extension techniques
- Immortality by uploading our consciousness and memories onto a computer
- The Metaverse, a virtual reality world

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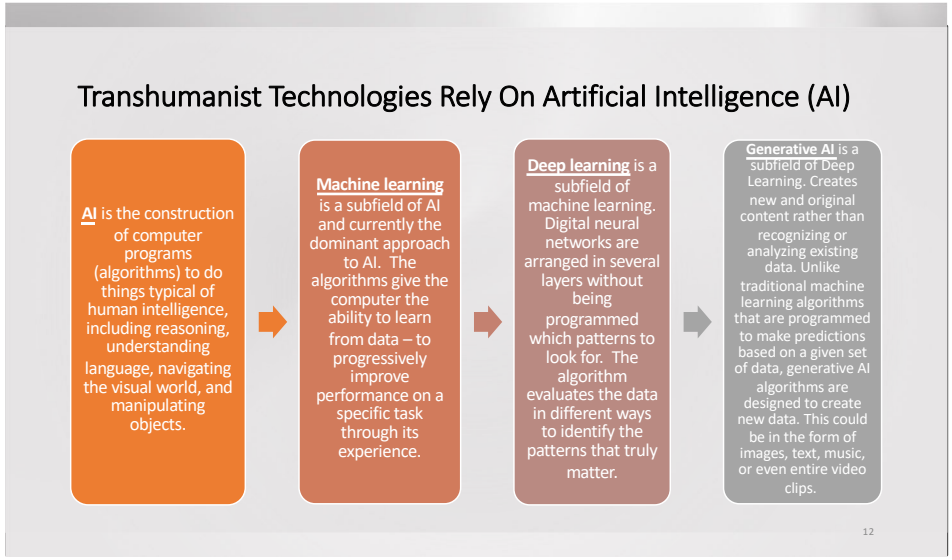

Kartik Hosanger, *A Human's Guide to Machine Intelligence: How Algorithms are Shaping Our Lives and How We Can Stay in Control* (Viking 2019) 90-93, N. Razavian et al, *Artificial Intelligence Explained for Nonexperts*, NIH National Library of Medicine (Feb. 24, 2020), available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7393604/; Red Blink Technology, *Generative AI vs Machine Learning vs Deep Learning Differences* (Mar. 16, 2023), available at https://redblink.com/generative-ai-vs-machine-learning-vs-deep-learning/#Generative_AI_Vs_Machine_Learning_Vs_Deep_Learning.

AI Computing Powers

- The latest iPhone 14 has a neural network processing unit capable of 15.8 trillion operations (instructions) per second (trillion = 1^{12}), enabling even faster machine learning computations
- The fastest supercomputer in the world, DOE Oak Ridge Lab's Frontier, is capable of 2 quintillion operations per second (quintillion = 1^{18})
- Google's quantum computer Sycamore is 158 million times faster than Frontier

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Floating Point Operations Per Second (FLOPS), analogous to instructions. Apple press release, Hello, yellow! Apple introduces new iPhone 14 and iPhone 14 Plus (Mar. 7, 2023), available at https://www.apple.com/newsroom/2023/03/hello-yellow-apple-introduces-new-iphone-14-and-iphone-14-plus/#:~:text=The%206%2Dcore%20CPU%20with,and%20third%2Dparty%20app%20experiences; Michigan State Univ., MSU is taking the world's fastest supercomputer to the final frontier (Mar. 16, 2023), available at https://msutoday.msu.edu/news/2023/msu-takes-fastest-supercomputer-to-final-frontier; Vidar, Google's Quantum Computer Is About 158 Miliion Times Faster Than The World's Fastest Supercomputer (Feb.), available at https://medium.com/predict/googles-quantum-computer-is-about-158-million-times-faster-than-the-world-s-fastest-supercomputer-36df56747f7f; US Int'l Trade Comm., Data Centers Around the World: A Quick Look (May 2021), available at https://www.usitc.gov/publications/332/executive_briefings/ebot_data_centers_around_the_world.pdf.

Clustered Regularly Interspersed Short Palindromic Repeats (CRISPR) Gene Editing

CRISPR-Cas9 gene editing has proven feasible to:

- Deleting specific regions of the genome
- Inserting DNA into specific genome sites
- Replacing specific DNA segments within the genome
- Rearranging specific regions of the genome
- Turning specific genes on and off
- Altering gene binding patterns

The human genome is comprised of DNA strands that contain in total approximately 20,000 genes in 12.8 billion genetic letter combinations (i.e, DNA double helixes of various Adenosine, Guansine, Cytidine, Thymidine nucleotide combinations)

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Humans 2.0, at 52. Adenosine, Guanosine, Cytidine, Thymidine. DNA stores the information necessary to make all the proteins used by the cell (the DNA sequences or combinations encode the amino acid sequence of proteins). Cas is CRISPR-associated protein (enzyme). Foreign DNA enters bacteria cell, is broken apart by Cas enzymes and stored in cell DNA as CRISPR repeats. CRISPR DNA made into special CRISPR RNA that guides Cas9 enzyme to target and breakdown new foreign DNA from viruses. Scientists figured out a way to create the special CRISPR RNA so as to guide the Cas9 enzyme to target specific DNA.

Clinical Studies Using CRISPR

- **Blood disorders**. Variations in the gene that encodes part of the hemoglobin molecule cause **sickle cell disease and beta thalassemia**. To remedy these variations, a patient's blood stem cells are harvested directly from their blood. Next, **scientists edit the genomes of these cells to turn on the fetal hemoglobin gene**. Then, chemotherapy eliminates the remaining disease-causing blood stem cells from the patient's body. Finally, billions of genome-edited stem cells are put back into their bloodstream by IV and take up residence in the bone marrow.
- **Cancer**. In CAR-T immunotherapy, researchers **genetically engineer an individual's T cell PD-1 gene to have a receptor that recognizes cancer cells**, thereby allowing the T cells to attack (cancer cells can cloak by appearing as safe to the receptors).

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Hope Henderson, *CRISPR Clinical Trials: A 2022 Update*, Innovative Genomics Institute (Mar. 29, 2022),available at https://innovativegenomics.org/news/crispr-clinical-trials-2022/

Clinical Studies Using CRISPR

- **Genetic Blindness**. Targeting a mutation in photoreceptor cells in the eye that cause Leber Congenital Amaurosis (LCA), inherited childhood blindness. This disease is caused by a single nucleotide mutation in a photoreceptor gene.
- **Type 1 Diabetes**. In Type 1 diabetes (T1D), pancreatic beta cells are destroyed, usually by an autoimmune reaction. Using CRISPR, **pancreatic cells are made from stem cells. CRISPR is used to edit the immune-related genes of these cells** so that the patient's immune system does not attack them.
- **HIV/AIDS**. HIV infects CD4 T lymphocytes, a type of immune cell that is important for fighting infections. HIV is a retrovirus, which means it stores copies of its own genetic material within the host's own genome in an inactive form. **CRISPR editing targets the HIV DNA sequence stored in the host cell genome, surgically excising most of the HIV genome**.

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Hope Henderson, *CRISPR Clinical Trials: A 2022 Update*, Innovative Genomics Institute (Mar. 29, 2022),available at https://innovativegenomics.org/news/crispr-clinical-trials-2022/

CRISPR Already Has Been Used To Genetically Engineer Twin Embryos

- In 2018, Chinese scientist He Jiankui edited the genes of twin embryos by deleting a single protein to make them immune to their father's HIV
- He was jailed and released in 2022.
- Other future germline applications of CRISPR:
  - Eye, hair color
  - Height, musculature

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Nicolas Guttierez, *What's next for the gene-edited children from CRISPR trial in China?*, New Scientist June 29, 2022, available at https://www.newscientist.com/article/mg25533930-700-whats-next-for-the-gene-edited-children-from-crispr-trial-in-china/; Bill McKibbon, *Falter* 143-150.

Beyond Remedying Diseases, CRISPR Allows Enhancing Of Human Traits

Genetic "enhancement" has been variously defined as:

- "boosting our capabilities beyond the species-typical level or statistically normal range of functioning"
- "**a nontherapeutic intervention intended to improve or extend a human trait**"
- "improvements in the capacities of existing individuals or future generations"
- "interventions that improve bodily condition or function beyond what is needed to restore or sustain health"

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Human Genome Editing: Science, Ethics, and Governance (National Academies Press 2017) Ch.6, available at https://www.ncbi.nlm.nih.gov/books/NBK447264/

CRISPR: A Path To The Posthuman

"CRISPR thus seems to be taking humanity into new, uncharted and unsettling territory of genetic posthumanism, **whether we like it or not**. And, once we begin editing, deleting and rewriting parts of ourselves as a species, we will no longer simply be "human" anymore . . . **We will be genetically engineered posthumans and those alterations will be transmissible to our offspring and their offspring.**"

Peter Mahon, *Posthumanism: A Guide for the Perplexed* (Bloomsbury Academic 2017) 78

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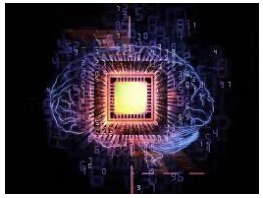
Brain Computer Interfaces and Neuroprosthetics

BCI: external devices (non-invasive) or brain implants (invasive) that allow the brain to transmit and receive information from an external source such as a computer or a prosthesis

Neuroprosthetic: a device designed to interface with the brain to compensate for lost sensory or motor functions

The interface between the brain and the computer or device is possible by converting the brain's electrical neural signals to algorithms that are machine readable



There are approximately 86 billion neurons in the human brain, comprising neural networks

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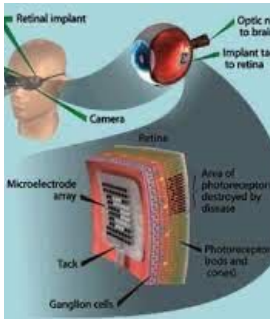
Human 2.0, at 68.

Current Medical Uses Of Neuroprosthetics



- Cochlear implants: A microphone placed behind the ear picks up sounds that are converted into electrical currents that are processed and delivered to electrodes implanted in the cochlea. The electrical activity stimulates the cochlear nerve that sends information to the brain.
- Retinal Implants: A camera records video, processes it, and then transmits data wirelessly to electrodes implanted in the retina. The implant converts the digital data to analog format and then stimulates the optic nerve.

Humans 2.0, at 80.

Current Research On Medical Uses of BCI

- **Control of a Robotic Arm**: In 2006, researchers implanted an array of microelectrodes into the brain of a quadriplegic that allowed the patient to use their thoughts to operate a computer cursor and direct a robotic arm.
- **Electronic skin**: A polymer film embedded with sensors that can detect temperature, pressure, and vibrations is wrapped around a prosthetic limb. As the sensors respond to environmental conditions, they transmit the information to the brain of the amputee through an implant or external device.
- **Locked-in syndrome**: Microelectrodes are implanted in the brains of patients that are paralyzed but cognizant. The electrodes allow recording of their neural activity that is then correlated by computer algorithms to words they heard and read.

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Humans 2.0, at 85-87.

BCI Implants At Work

DARPA Video (0:00-2:00)

- https://www.youtube.com/watch?v=A4BR4Iqfy7w&t=60s

Transhumanism Wants To Use BCI And Neuroprosthetics For Enhancing Human Abilities

- Enhancing a healthy person's memory and cognition
- Extending a healthy person hearing and vision beyond the normal frequency and wavelength ranges
- Equipping a healthy person with stronger limbs (might require amputation)
- Mind uploading

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Humans 2.0, at 69, 89-92.

Transhumanism Wants To Use BCI And Neuroprosthetics For Enhancing Human Abilities

"What these neuroprosthetic experiments make clear time and again is that **information is able to form loops between the body's nervous system and digital computers with relative ease**: neural activity is machine readable and machine activity is brain-readable. . . . **In short, neuroprosthetic medicine gives real scientific weight to posthumanism**."

Peter Mahon, *Posthumanism: A Guide for the Perplexed* (Bloomsbury Academic 2017) 81-82

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Humans 2.0, at 69.

Anti-Aging/Life Extension: Overcoming The Biological Limits Of Senescence

- Anti-aging: expanding longevity ("90 is the new 50") by curing and preventing age-related disease, thereby resetting the aging process of your body so that you live healthily longer
- Technologies:
  - SENS (Strategies for Engineered Negligible Senescence)
  - Blood transfusions (parabiosis)
  - Cryonics (biostasis)

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Senescence: deterioration of cells with age (can't divide or grow anymore).

Anti-Aging/Life Extension Will Get Us To LEV

- Anti-aging and life extension technology will improve to the point of getting us to Longevity Escape Velocity (LEV)
- LEV is when we gain more years of life through life extension than we lose through aging

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Strategies for Engineered Negligible Senescence (SENS)

- In *Ending Aging*, Aubrey de Grey explains that SENS consists of various anti-aging biotechnologies designed to repair age-related damage with the hope of maintaining adult humans in a presenescent state.

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Humans 2.0, 115.

Strategies for Engineered Negligible Senescence (SENS)

- **Preventing DNA mutations in the nuclear genome from leading to cancer (OncoSENS)**. Entails deleting the gene for telomerase (cancer cells have high levels of telomerase), which would end cancer, and replacing any resulting senescent cells with stem cells.
- **Repairing DNA mutations in the mitochondrial genome (MitoSENS)**. Entails incorporating mitochondrial genes into the nuclear genome. This would ensure a back-up copy of the mitochondrial genes exist in the event of mutations.
- **Clearing intracellular debris (LysoSENS)**. Cells generate waste products that accumulate as we age. Lysosomes are organelles that clean and recycle the cell's waste. To prevent loss of lysosome function that comes with age, lysosome enzymes would be introduced into the cell's genome.
- **Clearing extracellular debris (AmyloSENS)**. Amyloids are protein gunk that accumulates between cells as we age, forming plaque. Certain immune cells in the brain consume amyloids, and a vaccine can be developed from these cells to counter amyloid build-up.

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Humans 2.0, 115-122.

Strategies for Engineered Negligible Senescence (SENS)

- **Repairing extracellular cross-links (GlycoSENS)**. Reactions between sugar molecules and proteins in the body cause distortions in the proteins' structure, causing them to cross-link to other proteins. The result is an advanced glycation end-product (AGE) that accumulates in tissue over time and degrades tissue function, thus contributing to aging. A drug can be developed to disrupt AGEs.
- **Overcoming the atrophy and loss of cells (RepliniSENS)**. Certain tissues in our body (like muscle, heart, and nervous tissue) are not regenerative because they lack stem cells; once damaged they are not repaired. Embryonic stem cells and cloning techniques can be used to replace these cells.
- **Clearing toxic, senescent cells (ApoptoSENS)**. Entails removing toxic, non-dividing immune and fat cells produced over time, as well as senescent cells using some of the techniques discussed above.

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Humans 2.0, 115-121.

Parabiosis: Surgical Linkage Of Circulatory Systems

- In 2005, a Stanford lab announced that heterochronic parabiosis, or exchange of blood between older and younger animals—in this case mice—rejuvenated the livers and muscles of the older ones.
- The mice were stitched together so that they shared the same circulatory system.
- Billionaires invested in applying the technique to humans. Several companies currently offer plasma transfusions to older recipients from younger blood donors.
- One such company in the U.S., Ambrosia, offers transfusion at a price range of £6,000- £215,000, depending on number of transfusions.

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Tad Friend, "Silicon Valley's Quest to Live Forever," *The New Yorker* (Mar. 27, 2017); ABC Finance Blog, "How Billionaires Plan to Live Forever," available at https://abcfinance.co.uk/blog/how-billionaires-plan-to-live-forever/.

Cryonics And Human Cryostasis

- Cryopreservation of body (biostasis) upon being declared legally dead: reversible solid state suspended animation in liquid nitrogen through vitrification (replacing body fluids with a solution that prevents ice crystals to form when the body is frozen below freezing point of -196 C)
- Whole body or head (neural)
- Revived by nanobots using regenerative medicine yet to be developed
- Costs range from up to $290,000 for entire body and $80,000 for your head

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Cryonics Institute, Cryonics Preservation live webinar (May 2002), available at https://www.youtube.com/watch?v=KuLKO-gHS_M?feature=share.

Madrid Singularity Cryonics Webinar

https://www.youtube.com/live/KuLKO-gHS_M?feature=share

Video at 3:00-6:00

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Cryonics Institute, Cryonics Preservation live webinar (May 2002), available at https://www.youtube.com/watch?v=KuLKO-gHS_M?feature=share.

Immortality

- "Clearly, it is possible, through technology, to make death optional."

  Martine Rothblatt, founder of United Therapeutics, a company that intends to grow organs from peoples DNA

- "The proposition that we can live forever is obvious. It doesn't violate the laws of physics, so we will achieve it."

  Arram Sabeti, founder of ZeroCater, a company working on longevity and life extending technology

- "I felt it was maybe our mission here to transcend [death], and to preserve consciousness indefinitely."

  Bill Maris, founder of Calico

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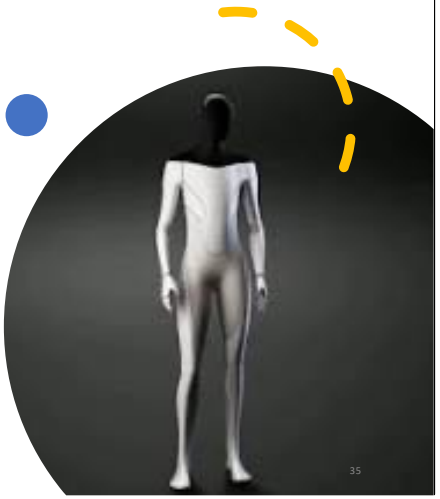
Tad Friend, "Silicon Valley's Quest to Live Forever," *The New Yorker* (Mar. 27, 2017).

Immortality: Uploading Consciousness

When asked if one day we could "download our human brain capacity" into Tesla's new humanoid robot Optimus, "which would be a different way of eternal life," Elon Musk replied:

"Yes, we could download the things that we believe make ourselves unique. . . As far as preserving our memories, our personality, I think we could do that."

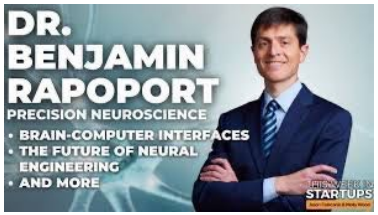


Joe Allen, Elon Musk is Driving Us Toward a "Smoother" Singularity, Substack (Apr. 5, 2022)

Uploading Consciousness

"The question is, What is the fundamental you that is you. Most people feel it's the mind. But can your mind exist only in a biological substrate that weighs 1.5 kilograms, is very wet, and floats like jellyfish. Or could it conceivably exist someplace else?"

Benjamin Rappaport, Co-founder of Neuralink and Precision Neuroscience



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Tad Friend, "Silicon Valley's Quest to Live Forever," *The New Yorker* (Mar. 27, 2017).

Androids For The Uploading

Video of Optimus (Tesla) (2023)

- https://www.youtube.com/watch?v=2dS0aDMQoD4

Video of Sophia (Hansen Robotics) (2018)

- https://www.youtube.com/watch?v=BhU9hOo5Cuc

Video of Ameca (Engineered Arts) (2022)

- https://youtu.be/yUszJyS3d7A

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Ray Kurzweil's Three Bridges to Indefinite Longevity/Immortality

- Bridge One (presently). **Using current technology to slow aging**: nutrition, exercise, supplements, early diagnosis of disease.
- Bridge Two (2025-2030). A biotech revolution will allow us to reprogram our biology to resist disease and eradicate any genetic propensities we have towards them. **Technologies like gene therapy and organ cloning and printing will offer personally tailored immune therapies for cancer and organs grown from our DNA. Bridge Two will bring us to LEV** (adding more than a year to every year you have left to live).
- Bridge Three (2045). **The Singularity**. Humans begin merging with machines.

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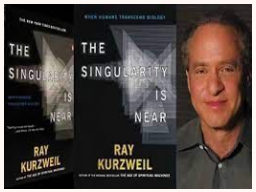
Ray Kurzweil and Terry Grossman, Transcend, available at https://transcend.me/pages/three-bridges-to-immortality; Tad Friend, "Silicon Valley's Quest to Live Forever," *The New Yorker* (Mar. 27, 2017).

The Singularity



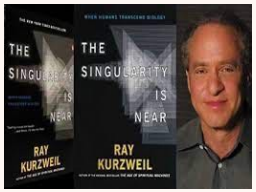
Ray Kurzweil was awarded the National Medal of Technology and Innovation in 1999 by Pres. Bill Clinton

- The Singularity is a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed.
- It will represent **the culmination of the merger of our biological thinking and existence with our technology,** resulting in a world that is still human but that transcends our biological roots. There will be **no distinction, post-Singularity, between human and machine or between physical and virtual reality**.

Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology* (Penguin Books 2006) 7, 9

Currently works at Google on machine learning and language processing.

The Singularity



Ray Kurzweil was awarded the National Medal of Technology and Innovation in 1999 by Pres. Bill Clinton

- Nanobots the size of blood cells replace neurons, blood cells, and destroy infections, reversing degenerating changes and rewrite our genetic code.
- The nanobots will connect our brains to a neocortical annex in the cloud, and our intelligence will expand a billionfold.
- "For a time, we'll be a hybrid of biological and nonbioloigical thinking, but as the cloud keeps doubling, the nonbiological intelligence will predominate . . . And it will be anachronistic, then to have one body."

Transcend, available at https://transcend.me/pages/three-bridges-to-immortality; Tad Friend, "Silicon Valley's Quest to Live Forever," *The New Yorker* (Mar. 27, 2017).

Superintelligence Is The Primary Characterstic Of The Singularity

The concept of the singularity is often associated with Vernor Vinge. . . . Provided that we manage to avoid destroying civilization, ***Vinge thinks that a singularity is likely to happen as a consequence of advances in artificial intelligence****, large systems of networked computers, computer-human integration, or some other form of intelligence amplification.* ***Enhancing intelligence will, in this scenario, at some point lead to a positive feedback loop: smarter systems can design systems that are even more intelligent, and can do so more swiftly than the original human designers. This positive feedback effect would be powerful enough to drive an intelligence explosion that could quickly lead to the emergence of a superintelligent system of surpassing abilities****.*

Nick Bostrom, *The Transhumanist FAQ* (Version 2.1 2003)

Nick Bostrom, Faculty of Philosophy, Oxford University

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Available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://nickbostrom.com/views/transhumanist.pdf.

Billionaire Investments In Transhumanist Technology

Billionaire	Amount	Company	Company Purpose
Peter Thiel (PayPal, Palantir)	$7 million	Methuselah Foundation	Funding R&D of regenerative medicine therapies
Larry Page and Sergey Brin (Google)	$1 billion +	California Life Company	Calico is a "longevity lab"
Bill Gates (Microsoft)	$100 million	Kymera Therapeutics	Targets disease-causing protein degradation
Jeff Bezos (Amazon)	Part of $116 million	Unity Biotechnology	Developing anti-aging therapeutics
Jeff Bezos	Part of $3 billion	Altos Labs	Multinational company developing cellular rejuvenation technology
Larry Ellison (Oracle)	$344 million	Ellison Medical Foundation	Funds research on understanding life-span and age-related diseases
Sam Altman (OpenAI)	$180 million	Retro Biosciences	Develop anti-aging therapeutics through cellular reprogramming
Elon Musk (Tesla, Space X)	$100 million	Neuralink	Developing BCI technologies

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Joshua Althauser, "Billionaires pouring in cash in immortality," Headline Bulletin (Mar. 20, 2023), available at https://hbuk.co.uk/human-longevity; Ester Bloom, "Google's co-founders and other Silicon Valley billionaires are trying to live forever," *CNBC Make It* (Mar. 31, 2017), available at https://www.cnbc.com/2017/03/31/google-co-founders-and-silicon-valley-billionaires-try-to-live-forever.html; John Harris, "If the super-rich want to live for ever our planet is truly doomed," *The Guardian* (Nov. 7, 2021), available at https://www.theguardian.com/commentisfree/2021/nov/07/billion-dollar-race-ageing-planet-old-age; Unity Technology Company Overview, available at https://ir.unitybiotechnology.com/; Lakshmi Varanasi, "OpenAI's Sam Altman is the latest tech entrepreneur making a play to extend human lifespan," Insider (March 8, 2023), available at https://www.businessinsider.com/list-wealthiest-entrepreneurs-searching-for-the-secret-to-longevity-2023-1; Rolfe Winkler, Elon Musk Launches Neurolink to Connect Brains With Computers, Wall Street Journal (Mar. 27, 2017), available at https://www.wsj.com/articles/elon-musk-launches-neuralink-to-connect-brains-with-computers-1490642652.

Billionaires Want To Live Longer To Enjoy Increased Wealth

"This is going to potentially exacerbate all the kinds of existing inequalities that we have... **The longer you're around, the more your wealth compounds, and the wealthier you are, the more political influence you have.**"

Christopher Wareham, bioethicist at Utrecht University

43

Maggie Harrison, "Experts Worried Billionaires Will Become Immortal, Compounding Wealth Forever," *Futurism* (Jan. 4, 2023), available at https://futurism.com/elderly-billionaires-immortal-compounding-wealth-forever.

BCI Next-Generation Battlefield Technologies

"Regarding the potential application of BCI, the future warfighter is likely to have increased requirements to:

- Digest and synthesize large amounts of data from an extensive network of humans and machines
- Make decisions more rapidly due to advances on AI, enhanced connectivity, and autonomous weaponry
- Oversee a greater number and types of robotics, including swarms."

RAND Corp., *Brain-Computer Interfaces: US Military Applications and Implications* (2020), 12

Current Research On Military Uses of BCI

- **Control of aircraft and drones**: In 2015, a paralyzed individual with a BCI implant (an array or microelectrodes) was able to connect to a flight simulator and steer a virtual fighter jet. In 2018, DARPA officials confirmed that a paralyzed individual equipped with a BCI was able to successfully command and control multiple simulated jet aircraft.
- **Helmets that assess cognitive performance**: The Army is developing helmets incorporating electronic sensors that fit perfectly with each user to monitor brain activity. The Air Force s developing a comprehensive cognitive monitoring system built into a pilot's helmet.
- **Human-machine teaming**: using BCIs to allow a human to think in real-time with a computer by integrating human thoughts or data into an artificial intelligence process conducted by machine.
- **Brain-to-brain communications**: non-invasive systems that read brain signals, transmit them over the internet, and transfer them to a second user as motor responses (e.g., the second user moves right or left).

45

W. Kucinski, *DARPA Subject Controls Multiple Simulated Aircraft With BCI*, SAE International (9/12/2018); M. Kryger et al., *Flight Simulation Using A BCI*, Experimental Neurology, Vol. 287, Part 4 (Jan. 2017) 473-78; RAND Corp., BCI: *US Military Applications and Implications* (2020), 7-9.

Current Research On Enhanced Soldiers (Supersoldiers)

Current projects are concerned with the direct intervention in the biology of the soldier to minimize and eliminate weakness.

- Project Inner Armor
  - **Environmental hardening**: allowing soldiers to excel in the world's harshest environments (hypothermia, heat, and altitude sickness)
  - **Kill-proofing**: disease mapping the entire world to protect soldiers against infectious disease, chemical, biological, and radioactive weapons by using enzymes that treat the side effects of radiation or chemotherapy to create universal immune cells that are capable of making antibodies to neutralize killer pathogens (man-made or natural)

46

Andrew Bickford, "'Kill-Proofing' the Soldier: Environmental Threats, Anticipation, and US Military Biomedical Armor Programs," 60 *Current Anthropology,* Supp. 19 (Feb. 2019).

Current Research On Enhanced Soldiers (Supersoldiers)

Synthetic blood. The most promising technology being investigated is a **respirocyte, an artificial red blood cell made from diamonds** that could contain gasses at pressures of nearly 15,000 psi and exchange carbon dioxide and oxygen the same way real blood cells do.

Super soldiers with respirocytes mixed with their natural blood would essentially have **trillions of miniature air tanks inside their body, meaning they would never run out of breath and could spend hours underwater without other equipment**.

Persistence in Combat. This initiative aims to help soldiers bounce back almost immediately from wounds**. Pain immunizations** would work for 30 days and eliminate the inflammation that causes lasting agony after an injury.

47

Logan Nye, "8 Technologies the Pentagon is pursuing to create super soldiers," *Business Insider* (Jul. 21, 2017), available at https://www.businessinsider.com/8-technologies-the-pentagon-pursuing-create-super-soldiers-2017-7

Current Research On Enhanced Soldiers (Supersoldiers)

CBN News on Cyborg soldiers (0:00-1:50)
https://www.youtube.com/watch?v=yr5t3lo5dCw

Boston Dynamics on military robots (0:00-1:30)
https://www.youtube.com/watch?v=Wu1kpnCylKQ

48

TeamViewer, Augmented Reality vs Virtual Reality (May 17, 2022), available at https://www.teamviewer.com/en-us/augmented-reality-ar-vs-virtual-reality-vr/.

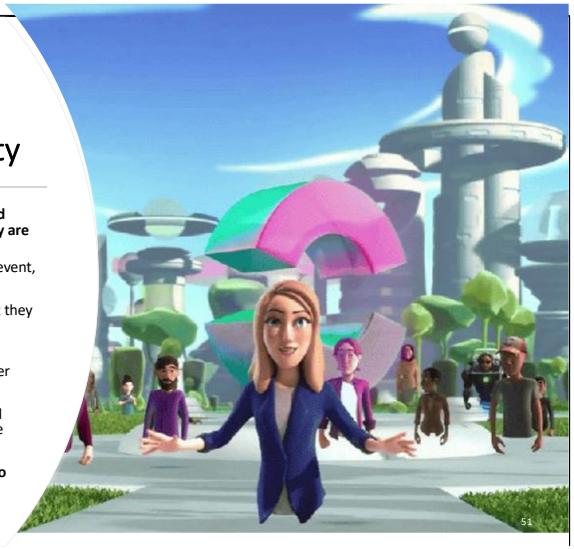
Augmented Reality (AR)

- AR displays digital content in the real world.
- Computer vision, depth tracking and mapping play a key role within this process.
- All data can be collected in real time via cameras, for example, and processed directly.
- This makes it possible to display digital content whenever the user needs it, using special glasses or visor.

TeamViewer, Augmented Reality vs Virtual Reality (May 17, 2022), available at https://www.teamviewer.com/en-us/augmented-reality-ar-vs-virtual-reality-vr/.

The Metaverse: 3D Immersion Virtual Reality

- A computer-generated **environment inhabited and shared by lots of people simultaneously, as if they are physically proximate**
  - hundreds of millions experiencing the same event, at the same time, in the same virtual place
- **Each person will be represented by an avatar** that they have constructed. They are one's proxy in the Metaverse and a means of self-expression
- Avatars can move from one virtual world to another (**interoperable**)
- **You can buy and sell virtual goods and virtual real estate** in the Metaverse. Financial transactions are handled by **cryptocurrency**
- The size of the **metaverse economy is estimated to reach $3.65 trillion annually by 2032**.



Sue Halpern, "The Specter of Our Virtual Future", *The New York Review of Books* (Oct. 20, 2022 issue); Debra Kamin, The Next Hot Housing Market Is Out of This World. It's in the Metaverse," *New York Times* (Feb. 19, 2023), available at https://www.nytimes.com/2023/02/19/realestate/metaverse-vr-housing-market.html.

Mark Zuckerberg's Vision Of The Metaverse

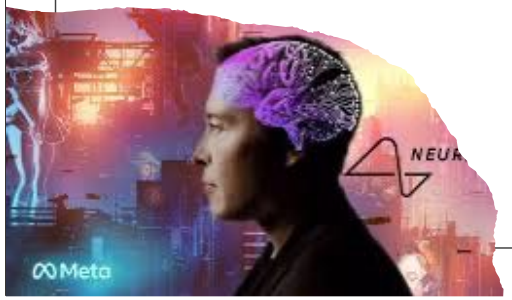
"Our north star is, **can we get a billion people into the metaverse doing hundreds of dollars apiece in digital commerce by the end of the decade?** If we do that, we'll build a business that is as big as our current **ad business** within this decade. . . . [I] think a big part of how you do that is by pushing the open metaverse forward, which is what were going to do."

Mark Zuckerberg to Meta employees in July 2022

52

Sue Halpern, "The Specter of Our Virtual Future", *The New York Review of Books* (Oct. 20, 2022 issue)

Kurzweil's Bridge Three Entails Integrating Our Brains With The Metaverse



According to Kurzweil, by the time of the third bridge to immortality:

> "**We'll be able to provide full-immersion virtual reality from within the central nervous system**. 'Nanobots' could shut down the signals coming from your real nervous system and put in place signals you would be receiving if you were in the virtual environment."

Elon Musk's **Neuralink is developing BCI chips for such full metaverse integration**.

> "Long term, a sophisticated Neuralink could put you fully, fully in a virtual reality thing."

Ray Kurzweil and Terry Grossman, Transcend, available at https://transcend.me/pages/three-bridges-to-immortality;Evan Ezquer, "Elon Musk's Neuralink Metaverse: What it Would Look Like," Metaroids (Aug. 16, 2022), available at https://metaroids.com/learn/elon-musk-neuralink-metaverse/; Victor Tangermann, "Elon Msk Says The Metaverse Sucks and Neuralink Will Be Better," Futurism (Dec. 22, 2021), available at https://futurism.com/elon-musk-metaverse-sucks-neuralink-better.

Critique

- Idolatry
- Denies the Resurrection
- Serves empire
- Supplants work as a human dignity
- Ethical standards permit transhumanist technologies
- Existential threat
- Feminist Critique

54

Idols, Psalm 115:3-8

Their idols are silver and gold,
the work of peoples' hands.
They have mouths, but do not speak;
eyes, but do not see.
They have ears, but do not hear;
noses, but do not smell.
They have hands, but do not feel;
feet, but do not walk;
and they do not make a sound
in their throat.
Those who make them are like them;
so are all who trust in them.

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NRSV

Today's Idols Are "Smart"

Unlike ancient times, today's Idols can see, speak, hear, smell, feel, and move

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Idols: What We Divinize And Allow To Have Dominion Over Us

"Babylon's futility is her idolatry—**her boast of justifying significance or moral ultimacy in her destiny**, her reputation, her capabilities, her authority, her glory as a nation. The moral pretenses of Imperial Rome . . .the anxious insistence that America be 'number one' among nations are all versions of Babylon's idolatry. All share in this **grandiose view of the nation by which the principality assumes the place of God in the world**."

William Stringfellow, *An Ethic for Christians & Other Aliens in a Strange Land* (World Books 1973) 51

57

Cornell West On Today's Idols

"Market, state, race, gender: all of these can become idols. An idol is anything that is deified and fetishized rather than placed under the cross. That idolatry leads to spiritual poverty."

Plough, The Politics of the Gospel, An Interview (Mar. 25, 2020), available at https://www.plough.com/en/topics/justice/politics/the-politics-of-the-gospel.

Philip Berrigan On Today's Idols

"The Holy Spirit reminds us that until we name the Beast, i.e., expose its lies and curb, however modestly, its destructiveness, it names us, defines us, enslaves us as accomplices in its colossal crimes."

Phil Berrigan, *Of Beasts and Beastly Images: Essays Under the Bomb* (Sunburst Press 1978) Inscription

59

Transhumanism Divinizes Technology

"[T]he most interesting place in the world from a religious perspective is . . . Silicon Valley. That's where **hi-tech gurus are brewing for us brave new religions that have little to do with God, and everything to do with technology.** They promise all the old prizes—happiness, peace, prosperity and even eternal life—but here on earth with the help of technology, rather than after death with the help of celestial beings."

Yuval Noah Harari, *Homo Deus: A Brief History of Tomorrow* (Harper Collins 2017) 159

The Catholic Worker Addressed Technology As An Idol From Its Beginning

Distorted truth

Look at the worldly
and all who set themselves up
above the temple of God.
Has not God's image and His truth
been distorted in them?

Nothing in Science

They have science;
but in science there is nothing
but what is the object of sense.
The spiritual world,
the highest part of man's being
is rejected altogether,
dismissed with a sort of triumph,
even with hatred.

Peter Maurin, *The Wisdom of Dostoievsky*, CW May 1, 1934, pg. 1


The Catholic Worker

CATHOLIC CHURCH STANDS ALONE TODAY AS ALWAYS—THE TRUE INTERNATIONAL

Demonstrations by Communist Party in Anti-War Fight

Bishops Reaffirm Right of Workers To Form Unions

FROM 2,500 TO 31,000 COPIES MARKS FIRST ANNIVERSARY OF THE CATHOLIC WORKER

Jaques Ellul On Technology

"**Technology fully satisfies the mystic will to possess and dominate. It is unnecessary to evoke spiritual powers when machines give much better results.** But technology also encourages and develops **mystical phenomena**. It promotes the indispensable alienation from the self necessary, for example, for the identification of the individual with an ideology."

The Technological Society (Vintage Books 1964) 423

62

Thomas Merton On Technology

"Technology now has reasons entirely its own which do not necessarily take into account the needs of man, and this huge inhuman mechanism, which the whole human race is now serving rather than commanding, seems quite probably eared for the systematic destruction of the natural world . . . . **[B]ehind the cloak of specious myths about technology and progress, there seems to be at work a vast uncontrolled power which is leading man where he does not want to go** in spite of himself[.]

Thomas Merton, Letter to Bernard Haring (Dec. 26, 1964), in *The Hidden Ground of Love: Letters* (Farrar Strauss Giroux 1985) 383-84

63

"The Godfather" Of AI Is Scared About The Risks Of Smarter And Smarter AI

Dr. Geoffrey Hinton quit his job at Google last week, so he can freely speak out about the risks of A.I. A part of him now regrets his life's work.

When people used to ask him how he could work on technology that was potentially dangerous, **he would paraphrase Robert Oppenheimer, who led the U.S. effort to build the atomic bomb: "When you see something that is technically sweet, you go ahead and do it."**

64

Cade Metz, *"The Godfather of AI" leaves Google and Warns of Danger Ahead*, New York Times (May 1, 2023), available at https://www.nytimes.com/2023/05/01/technology/ai-google-chatbot-engineer-quits-hinton.html?auth=login-email&login=email

Rosemary Radford Reuther On Technology

- "**The crisis of ecology and technology reflects th[e] context of social injustice and unequal power relations within which the industrial revolution arose** and which it escalated into a global war of the rich against the poor for the resources of the earth."
- "The human capacity for technological rationality is itself the highest gift of nature. **It needs to be freed from its captivity to ruling-class domination** . . . . What is needed is democratization of decision-making over technological development and equalization of its benefits."

New Woman New Earth; Sexist Ideologies and Human Liberation 193, 205 (Beacon Press 1995, 20th anniversary ed.)

65

See also Mary Mellor, New Women, New Earth—Setting the Agenda, 10 Organization & Environment 296, 299 (1997)

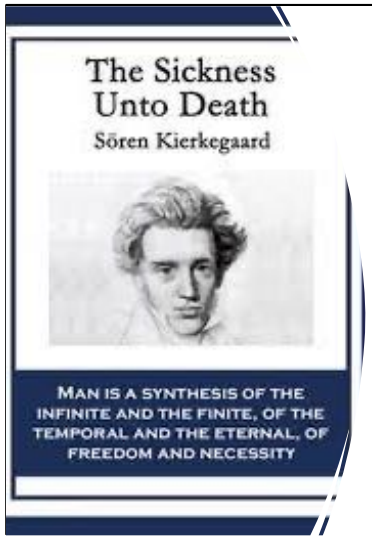
In “Cheating Death,” Transhumanism Denies the Resurrection

Kurzweil has preserved fifty boxes of his father’s effects, everything from his letters and photographs to his electric bills, all pack-ratted into a storage facility in Newton, Massachusetts. He hopes to someday create a virtual avatar of his father and then populate the doppelgänger’s mind with all this information, as well as his own memories about his father, exhuming a Fredric Kurzweil 2.0.”

- "I will be able to talk to this re-creation," he explained. "**Ultimately, it will be so realistic it will be like talking to my father.**"

“I am the resurrection and the life; those who believe in me, though they die, yet shall they live.” Jn. 11:25

Tad Friend, *Silicon Valley’s Quest to Live Forever*, The New Yorker (Apr. 3, 2017); John Berman, *Futurist Ray Kurzweil Says He Can Bring His Dead father Back to Life Through a Computer Avatar*, ABC News (Aug. 9, 2011), available at https://abcnews.go.com/Technology/futurist-ray-kurzweil-bring-dead-father-back-life/story?id=14267712; The Raising of Lazarus, Duccio de Buoninsegna 1310-11.



In Denying The Resurrection, Transhumanism Exemplifies The Despair of A Spiritless Self

- In *The Sickness Unto Death*, Kierkegäard reflects on the raising of Lazarus and Jesus's statement that "this sickness is not unto death." (Jn. 11:4)
- For Kierkegäard, the sickness unto death is despair at not realizing that the self is an eternal, spiritual being created by God and death is a transition to eternal life.
- Transhumanists, believing that there is nothing beyond this life, that there is no God, and that death can be cheated by technological immortality of the self, suffer from this despair.

67

Sören Kierkegärd, *Fear and Trembling and The Sickness Unto Death* (Walter Lowrie trans., Princeton U. Press 2d prtg. 1969) 144, 150-54.

Transhumanism Serves Empire: Military Supremacy

"As a DARPA program manager and physician-scientist . . . . **It is my goal to provide our men and women with an unfair advantage over the enemy. . . . I DO NOT accept that our Soldiers cannot physically outperform the enemy on his home turf.**"

Michael Callahan, Program Manager of DARPA's Defense Science Office

68

Andrew Bickford, "'Kill-Proofing' the Soldier: Environmental Threats, Anticipation, and US Military Biomedical Armor Programs," 60 *Current Anthropology,* Supp. 19 (Feb. 2019).

Serves Empire: For The Wealthy

For the wealthy and wealthy countries

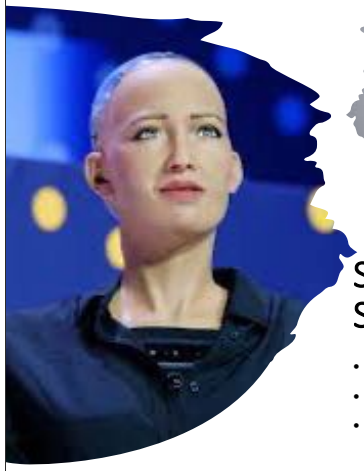
Driven by capitalism

Requires security of resources abroad

To colonize space: “Nanotechnology will also make it cheaper to colonize space.” Nick Bostrom

69

The Transhumanist FAQ (V2.1, 2003).



Serves Empire: White Supremacy

- Virtually all promoters are white
- A search of “Android” on Google results in white-looking androids
- A modern form of eugenics

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Serves Empire: The Dominant Power Structure

Interviewer: "**Over the years you have used the expression 'imperialist white supremacist capitalist patriarchy' to describe the power structure underlying the social order.** Why tie those terms together as opposed to stressing any one of them in isolation?

bell hooks: **We can't begin to understand the nature of domination if we don't understand how these systems connect with one another."**

71

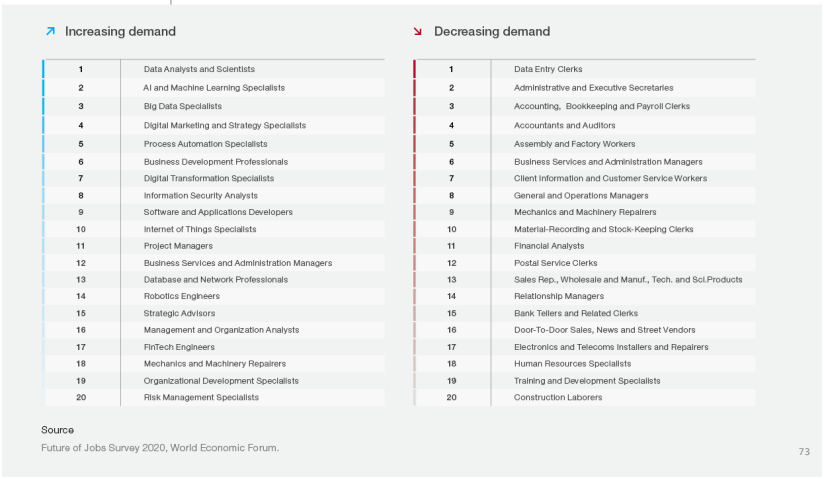
George Yancy and bell hooks, *bell hooks: Buddhism, the Beats and Loving Blackness*, New York Times Opinionator (Dec. 10, 2015), available at https://archive.nytimes.com/opinionator.blogs.nytimes.com/author/bell-hooks/.

Transhumanism Is Already Transforming Human Work

"**Forged laborers [robots] will displace the need for most skilled labor; synthetic intellects will largely supplant the skilled trades of the educated**. When initially deployed, many new technologies will substitute directly for workers, getting the job done pretty much the same way. **But other innovations will not only idle the workers; they will eliminate the types of jobs that they perform**."

Jerry Kaplan, *Humans Need Not Apply: A Guide to Wealth and Work in the Age of AI* (Yale Univ. 2015) 134

FIGURE 22 | Top 20 job roles in increasing and decreasing demand across industries



	Increasing demand	Decreasing demand
1	Data Analysts and Scientists	Data Entry Clerks
2	AI and Machine Learning Specialists	Administrative and Executive Secretaries
3	Big Data Specialists	Accounting, Bookkeeping and Payroll Clerks
4	Digital Marketing and Strategy Specialists	Accountants and Auditors
5	Process Automation Specialists	Assembly and Factory Workers
6	Business Development Professionals	Business Services and Administration Managers
7	Digital Transformation Specialists	Client Information and Customer Service Workers
8	Information Security Analysts	General and Operations Managers
9	Software and Applications Developers	Mechanics and Machinery Repairers
10	Internet of Things Specialists	Material-Recording and Stock-Keeping Clerks
11	Project Managers	Financial Analysts
12	Business Services and Administration Managers	Postal Service Clerks
13	Database and Network Professionals	Sales Rep., Wholesale and Manuf., Tech. and Sci.Products
14	Robotics Engineers	Relationship Managers
15	Strategic Advisors	Bank Tellers and Related Clerks
16	Management and Organization Analysts	Door-To-Door Sales, News and Street Vendors
17	FinTech Engineers	Electronics and Telecoms Installers and Repairers
18	Mechanics and Machinery Repairers	Human Resources Specialists
19	Organizational Development Specialists	Training and Development Specialists
20	Risk Management Specialists	Construction Laborers

Source

Future of Jobs Survey 2020, World Economic Forum.

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WEF Future of Jobs 2020, available at https://www.weforum.org/reports/the-future-of-jobs-report-2020/in-full/chapter-2-forecasts-for-labour-market-evolution-in-2020-2025#chapter-2-forecasts-for-labour-market-evolution-in-2020-2025.

Studies On Automation Of Labor Indicate A Large Displacement Of Workers

- A 2014 analysis by Belgian economic think tank Bruegel: **54% of EU jobs are at risk of computerization**.
- Oxford researchers studied 702 occupational groupings in 2013 and found that **47% of U.S. workers have a high probability of seeing their jobs automated over the next 20 years**.
- A 2017 McKinsey report found that **30% of work activities could be automated by 2030 and up to 375 million workers worldwide could be effected** by emerging technologies.
- The WEF Future of Jobs Report 2020 estimates that **by 2025, "85 million jobs may be displaced by a shift in the division of labour between humans and machines, while 97 million new roles may emerge** that are more adapted to the new division of labour between humans, machines and algorithms".

74

Darrell M. West, "Will robots and AI take your job? The economic and political consequences of automation," Brookings (Apr. 18, 2018), available at https://www.brookings.edu/blog/techtank/2018/04/18/will-robots-and-ai-take-your-job-the-economic-and-political-consequences-of-automation/; WEF Future of Jobs 2020 Executive Summary, available at https://www.weforum.org/reports/the-future-of-jobs-report-2020/in-full/executive-summary#executive-summary.

The Displacement Of Labor By Automation Will Be Disruptive And Require Retraining

- Even assuming the new jobs created equals or exceeds the jobs lost, displaced workers first must be retrained/educated in order to remain employed
- Not everyone losing a job could be retrained for a new job
- What will happen to those not employable?

  "Computers, intelligent machines and robots seem like the workforce of the future. And as more and more jobs are replaced by technology, **people will have less work to do and ultimately will be sustained by payments from the government**." Elon Musk

75

Catherine Clifford, "Elon Musk: Robots will take your jobs, government will have to pay your wage," CNBC (Nov. 4, 2016), available at

For the CW, Work Is More Than A Job

The Benedictine charism of integrating work and prayer were critical for Dorothy Day and Peter Maurin

- Manual toil is "necessary for the health of the body and the soul; necessary as penance for our sins. . . ; necessary as **an exercise of creation, we make ourselves co-creators with God, taking [God's] raw materials and constructing, building, sewing, cooking, baking, sheltering, warming, and recreating ourselves**." CW Sept. 1942 at 4.
- "Peter Maurin made manual labor and voluntary poverty the foundation of his teaching and these are our techniques of action, he said. Always he quoted St. Benedict whose motto 'Pray and Work' was his also. He and Father Virgil Michel the Benedictine, used to talk endlessly about **work in relation to bodily and mental health and in his vision of the integrated life--a life in which man would be as happy as possible in his labors**." CW Oct. 1949 at 4.

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CW Sept. 1942 page 7; CW Oct. 1949 page 4.

Ethical Guidelines: White House Blueprint for An AI Bill of Rights

- **Safe and Effective systems**: Automated systems should be developed to identify concerns, risks, and potential impacts of the system. Systems should undergo pre-deployment testing, risk identification and mitigation, and ongoing monitoring that demonstrate they are safe and effective based on their intended use.
- **Algorithmic discrimination:** You should not face discrimination by algorithms and systems should be used and designed in an equitable way.
- **Data privacy**: You should be protected from abusive data practices via built-in protections and you should have agency over how data about you is used.
- **Notice and explanation**: You should know that an automated system is being used and understand how and why it contributes to outcomes that impact you.
- **Human alternatives, consideration, and fallback**: You should be able to opt out, where appropriate, and have access to a person who can quickly consider and remedy problems you encounter.

77

The White House, Blueprint for an AI Bill of Rights (Oct. 2022), available at https://www.whitehouse.gov/ostp/ai-bill-of-rights/.

Ethical Guidelines: The Rome Call

Signed by the Pontifical Academy for Life, Microsoft, IBM, FAO, and Italy, the call express the signatories' desire to work together to promote "algor-ethics", namely the ethical use of AI as defined by the following principles:

1. **Transparency**: in principle, AI systems must be explainable.
2. **Inclusion**: the needs of all human beings must be taken into consideration so that everyone can benefit.
3. **Responsibility**: those who design and deploy the use of AI must proceed with responsibility and transparency.
4. **Impartiality**: do not create or act according to bias, thus safeguarding fairness and human dignity.
5. **Reliability**: AI systems must be able to work reliably.
6. **Security and privacy**: AI systems must work securely and respect user privacy.

78

Pontifical Academy for Life, "Rome Call for Artificial Intelligence Ethics," 28 Feb. 2020, available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://feamc.eu/rome-call-for-artificial-intelligence-ethics/?print=pdf

Gene Editing Regulation In U.S.

- **Federal law prohibits the use of federal funds for research on human germline gene therapy**
  - Consolidated Appropriations Act of 2020 (omnibus spending bill) contains one provision that restricts federal funding of human embryo research (widely known as the Dickey–Wicker Amendment) and
  - Another that prohibits the Food and Drug Administration from considering applications for clinical trials "in which a human embryo is intentionally created or modified to include a heritable genetic modification."
  - Several U.S. states ban specific research activities involving human embryos (e.g., for cloning or for stem cell research).
- **There is no federal legislation that dictates protocols or restrictions regarding human (somatic) genetic engineering**
- **There is no law or regulation that bans germline gene editing conducted through private funding**
  - However, marketing any therapy or product from such editing would require FDA approval, which approval is prohibited

79

Françoise Baylis et al., *Human Germline and Heritable Genome Editing: The Global Policy Landscape*, 3 CRISPR Journal 365, 370 (2020); Global Gene Editing Regulation Tracker, United States: Germline Embryonic, available at https://crispr-gene-editing-regs-tracker.geneticliteracyproject.org/united-states-embryonic-germline-gene-editing/#:~:text=Federal%20law%20prohibits%20the%20use,restrictions%20regarding%20human%20genetic%20engineering.

Vatican CDF Instruction *Dignitas Personae* On Certain Bioethical Questions: Gene Therapy

Part 3 of the Instruction, New Treatments which Involve the Manipulation of The Embryo or the Human Genetic Patrimony, provides:

- **Procedures used on somatic cells for strictly therapeutic purposes are in principle morally licit**
- **In its current state, germ line cell therapy in all its forms is morally illicit**
  - risks connected to genetic manipulation are considerable, not yet fully controllable
  - such therapy takes place in the context of in vitro fertilization
- **No genetic engineering for purposes other than medical treatment**
  - promotes a eugenic mentality that privileges certain culture or society
  - violates fundamental truths of equality and justice, thus harming the common good
  - in attempting to create a new type of human being, one can recognize an ideological element in which man tries to take the place of his/her Creator.

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Available at https://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20081208_dignitas-personae_en.html

Vatican CDF Instruction *Dignitas Personae* On Certain Bioethical Questions: Stem Cells

- **Obtaining of stem cells from a living human embryo** invariably causes the death of the embryo and is consequently **gravely illicit**
- Obtaining stem cells which do not cause serious harm to the subject from whom the stem cells are taken are to be considered licit, i.e., an adult organism; the blood of the umbilical cord at the time of birth; fetuses who have died of natural causes
- There are no moral objections to the clinical use of stem cells that have been obtained licitly
- Research initiatives involving the use of adult stem cells, since they do not present ethical problems, should be encouraged and supported

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Available at https://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20081208_dignitas-personae_en.html

Open Letter To Pause Generative AI Development

"[R]ecent months have seen **AI labs locked in an out-of-control race to develop and deploy ever more powerful digital minds that no one – not even their creators – can understand, predict, or reliably control**. . . .

[W]e must ask ourselves: Should we let machines flood our information channels with propaganda and untruth? Should we automate away all the jobs, including the fulfilling ones? Should we develop nonhuman minds that might eventually outnumber, outsmart, obsolete and replace us? Should we risk loss of control of our civilization? **Such decisions must not be delegated to unelected tech leaders**.

Therefore, we call on all AI labs to **immediately pause for at least 6 months** the training of AI systems more powerful than GPT-4."

- On May 3, 2023, the DOD Chief of Intelligence, John Sherman, at a cyberconference, rejected such a pause, stating: "[I]f we stop, guess who's not going to stop: potential adversaries overseas. **We've got to keep moving**."

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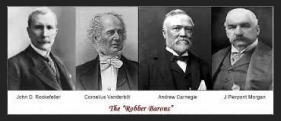
Future for Life Institute, *Pause Giant AI Experiments: An Open Letter* (Mar. 22, 2023), available at https://futureoflife.org/open-letter/pause-giant-ai-experiments/; Cade Metz & Gregory Schmidt, *Elon Musk and Others Call for Pause on AI, Citing "Profound Risks to Society* (Mar. 29, 2023), available at https://www.nytimes.com/2023/03/29/technology/ai-artificial-intelligence-musk-risks.html.; Brandi Vincent, *Pentagon CIO and CDAO: Don't pause generative AI development — accelerate tools to detect threats*, DEFENSESCOOP (May 3, 2023), available at https://defensescoop.com/2023/05/03/pentagon-cio-and-cdao-dont-pause-generative-ai-development-accelerate-tools-to-detect-threats/.

THE LOCOMOTIVE BREATH



Attempts at ethical standards have not paused these technologies; they continue unabated

"The train it won't stop going no way to slow down" (Jethro Tull)

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Existential Threat

"**The development of full artificial intelligence could spell the end of the human race.** It would take off on its own, and re-design itself at an ever-increasing rate. Humans, who are limited by slow biological evolution, couldn't compete, and would be superseded."

Stephen Hawking

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Rory Cellan-Jones, "Stephen Hawking warns artificial intelligence could end mankind," BBC News (Dec. 2, 2014), available at https://www.bbc.com/news/technology-30290540.

Existential Threat

"**Could transhumanist technologies cause our extinction? Yes, and this implies an urgent need to analyze the risks before they materialize and to take steps to reduce them**. . . . [I]f and when superintelligence is created, it will be of paramount importance that it be endowed with human-friendly values. An imprudently or maliciously designed superintelligence, with goals amounting to indifference or hostility to human welfare, could cause our extinction."

Nick Bostrom

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Nick Bostrom, *The Transhumanist FAQ* (V 2.1 (2003)) 22-24.

Vernor Vinge: The Physical Extinction of the Human Race is a possibility of the Singularity

"If the Singularity can not be prevented or confined, **just how bad could the Post-Human era be? Well ... pretty bad. The physical extinction of the human race is one possibility.** (Or as Eric Drexler put it of nanotechnology: Given all that such technology can do, perhaps governments would simply decide that they no longer need citizens.) **Yet physical extinction may not be the scariest possibility**. Think of the different ways we relate to animals. A Posthuman world would still have plenty of niches where **human-equivalent automation** would be desirable . . . ."

Vernor Vinge, *The Technological Singularity* (1993)

Vernor Vinge, Department of Mathematical Sciences, San Diego State University

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Vernor Vinge, "The Technological Singularity" (1993), available at https://frc.ri.cmu.edu/~hpm/book98/com.ch1/vinge.singularity.html.

Feminist Critique: Rationality

"James Hughes argues for a definition of person stemming from John Locke: as 'a thinking, intelligent being, that has reason and reflection.'. . . **[T]here has been a longstanding set of criticisms arising from within feminist thought to reject an equation of personhood solely with the mind or rationalism**.

- First . . . **I am a body, and reducing personhood to intellectual capacities ignores the very ground from which rationality arises.**
- Second, feminists have been critical of philosophical and political moves to reduce moral personhood to rationalism **because of how the notion of reason has historically been used to exclude women, Africans, person with disabilities, and others from full moral and political standing."**

Amy Michelle DeBaets, *Enhancement for All? A Feminist Ethical Analysis of the Discourses and Practices of Democratic Transhumanism*, pages 6-7

Amy Michelle DeBaets, Ass't Prof. Biomedical Sciences, Oakland Univ. School of Medicine

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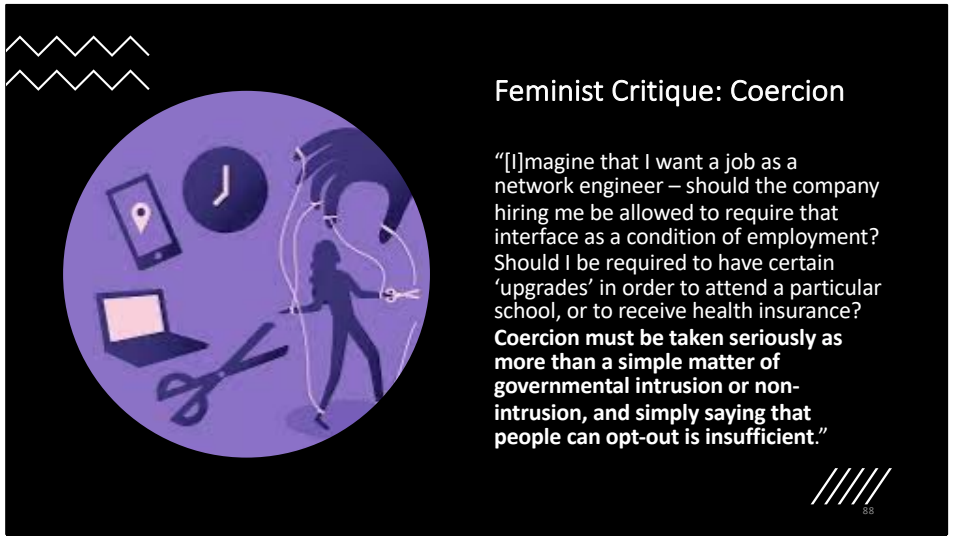
Amy Michelle DeBaets, "Enhancement for All? A Feminist Ethical Analysis of the Discourses and Practices of Democratic Transhumanism," pages 6-7, Conference Proceedings from Societas Ethica Annual Conference 2011, The Quest for perfection. The Future of Medicine/Medicine of the future, August 25-28, 2011. Universita della Svizzera Italiana, Lugano, Switzerland, available at chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ep.liu.se/ecp/074/001/ecp11074001.pdf.



Amy Michelle DeBaets, "Enhancement for All? A Feminist Ethical Analysis of the Discourses and Practices of Democratic Transhumanism," page 7.

Feminist Critique: Scientific Progress

"Feminists question the master narrative of scientific progress that is almost universal within transhumanism. In this narrative, 'reason, science, and technology…(are) slowly freeing us from ignorance, toil, pain, and disease.' **Things don't get better simply because we have the latest and greatest technology.** While I would certainly argue that there is such a thing as genuine progress, such as universal literacy or peaceful and free societies, these are not guaranteed either by the trajectories of history or the development of technology. **Technologies can be used to support both freedom and tyranny**."

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Amy Michelle DeBaets, "Enhancement for All? A Feminist Ethical Analysis of the Discourses and Practices of Democratic Transhumanism," pages 7-8.

Feminist Critique: Enhancement

- "Feminist and disability studies scholars also question some of the easy assumptions made by transhumanists regarding what constitutes "enhancement" and why. . . . There is generally an assumption made that, while existing persons with disabilities should not be discriminated against, it would be better in the long run for society if only non-disabled persons were born. **This assumes a fairly objective, medicalized model of disability in which disabilities are stable, identifiable, and in need of medical treatment, rather than a contextualized and socio-political one in which understandings of disability are heavily influenced by the way a particular society is constructed."**

Amy Michelle DeBaets, "Enhancement for All? A Feminist Ethical Analysis of the Discourses and Practices of Democratic Transhumanism," page 9.

Feminist Critique: Life Extension

"Transhumanists want to push forward and claim that life extension technologies are among the most pressing research priorities today. . . . **I do not think that the best approach is to ban the development of our life extension drug, but to regulate it and ensure that it does not overtake other urgent public health priorities,** and to make broad distribution possible through creative intellectual property applications so that it did not increase health disparities."

Amy Michelle DeBaets, "Enhancement for All? A Feminist Ethical Analysis of the Discourses and Practices of Democratic Transhumanism," page 13.