



Spinning in Circles

Structuring the circulation of techno cultural imaginaries of merging minds with machines

Three recurrent technofutures

The neurointerface to enhance the body

The neurointerface as an immersive
media experience

The neurointerface to upload the mind

Brain Banking (Nectome, 2018)

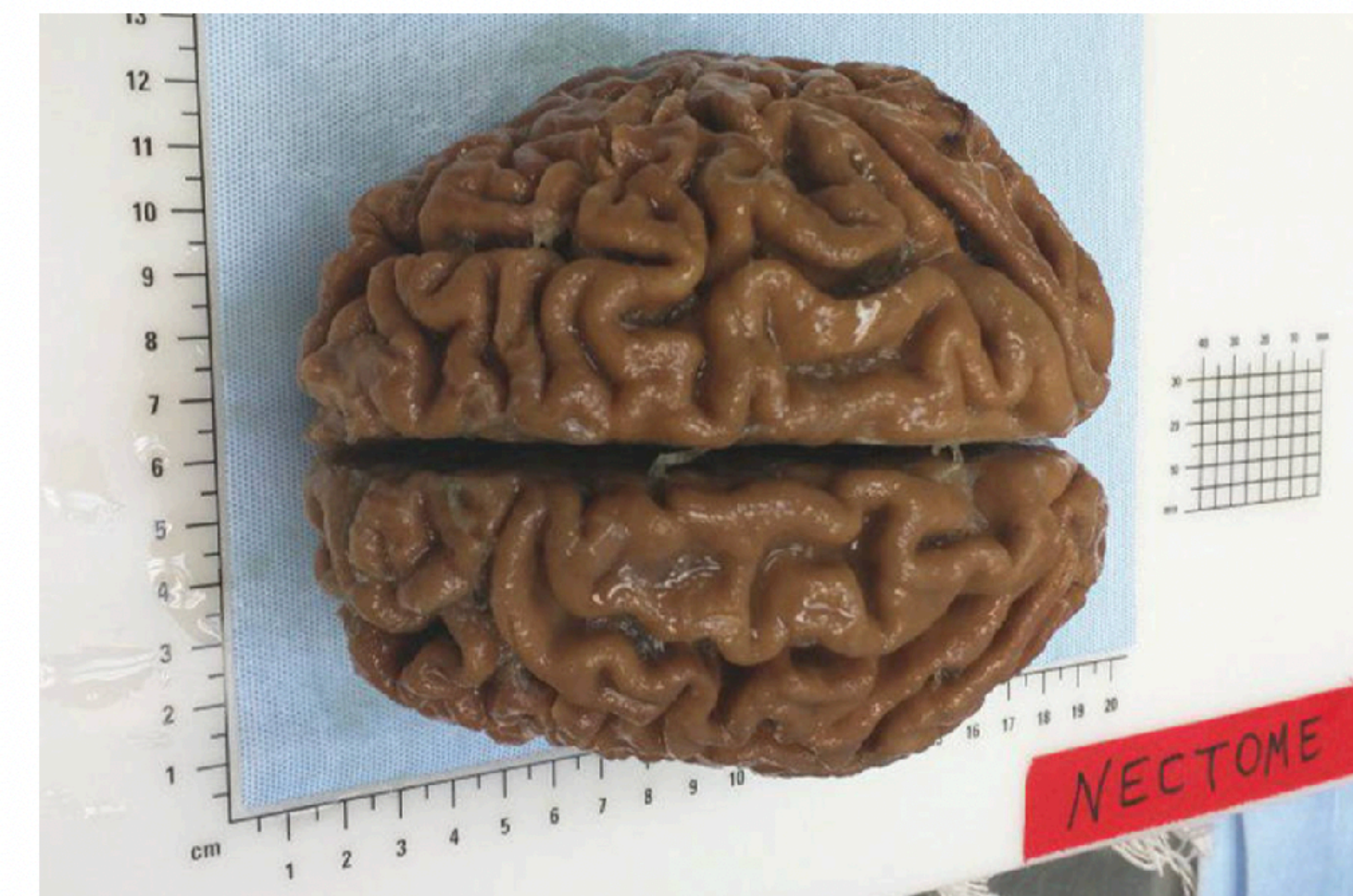
- ▶ „Preserve your brain to bring you back in the future“ (Nectome)
- ▶ „Back up your mind“ (Nectome)
- ▶ \$960,000 federal grant from the U.S. National Institute of Mental Health.

- ▶ „A growing number of scientists and technologists believe that **future technology may be capable of scanning a preserved brain's connectome** and using it as the basis for constructing a whole brain emulation, thereby **uploading that person's mind into a computer** controlling a robotic, virtual, or synthetic body,"
- Kenneth Hayworth, Brain Preservation Foundation

For \$10,000, A Silicon Valley Startup Will Kill You And Upload Your Brain To The Cloud

By Katie Serena
Published March 16, 2018

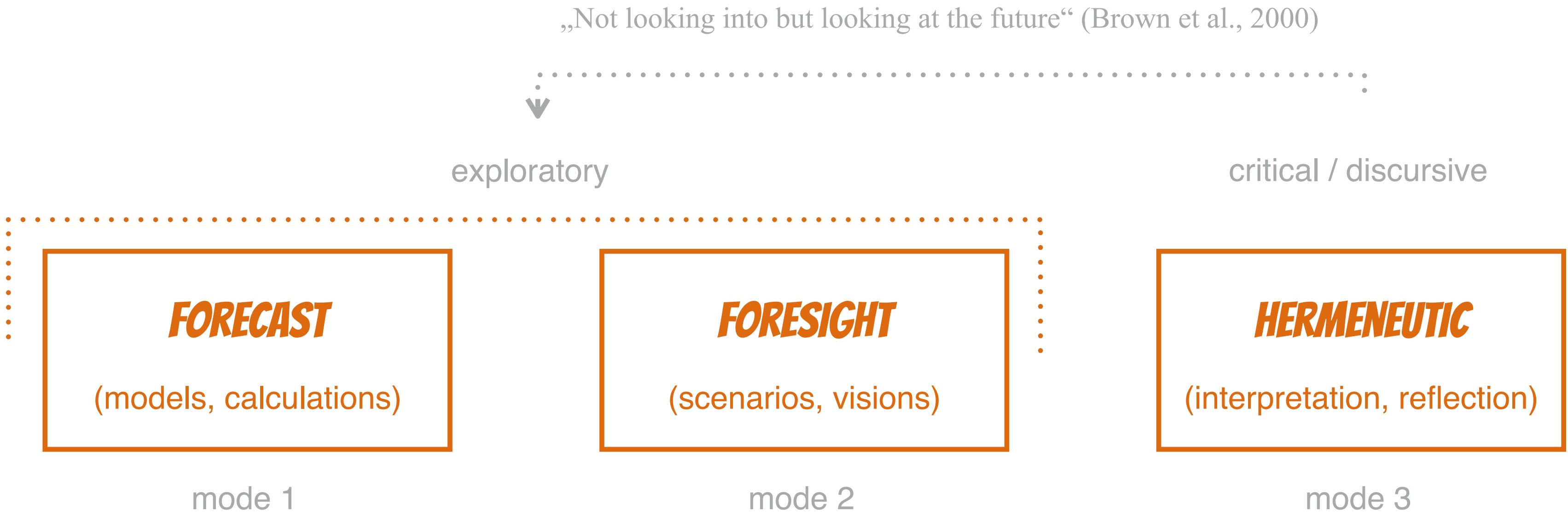
The company claims that with their technology, one day scientists will be able to scan your brain and create a digital you.



Technology Review

<https://brobible.com/culture/article/billionaire-pays-10k-brain-uploaded-cloud/>

Three Modes of Orientation (Grunwald, 2014)



Grunwald, Armin. 2014. „Modes of Orientation Provided by Futures Studies: Making Sense of Diversity and Divergence“. European Journal of Futures Research 2(1). doi: 10.1007/s40309-013-0030-5.

Brown, Nik, Brian Rappert, und Andrew Webster, Hrsg. 2000. Contested Futures: A Sociology of Prospective Techno-Science. Aldershot, England; Burlington, VT: Ashgate Publishing Limited.

The Imaginary
(noun)

Imaginarities and Imagination

- ▶ „It matters what *ideas* one uses to think other *ideas* (with).“ (Strathern, 1993, S. 10)
- ▶ It matters what ***imaginaries*** we use to ***imagine*** futures with.
- ▶ ‚*Imaginary*‘ is the **culturally shared inventory of meanings** that individuals draw upon to imagine something.
- ▶ ‚*Imagination*‘ is the **cognitive human ability** to imagine something absent. (Ernst & Schröter, 2020)

HOW DO YOU IMAGINE THE FUTURE?

Strathern, Marilyn. (1992). *Reproducing the Future: Essays on Anthropology, Kinship and the New Reproductive Technologies*. Routledge.

Ernst, C., & Schröter, J. (2020). *Zukünftige Medien: Eine Einführung*. VS Verlag für Sozialwissenschaften. <https://www.springer.com/de/book/9783658300586>

Castoriadis, C. (1975). *The Imaginary Institution of Society* (K. Blamey, Übers.; Reprint). MIT Press.

Haraway, D. J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press Books.

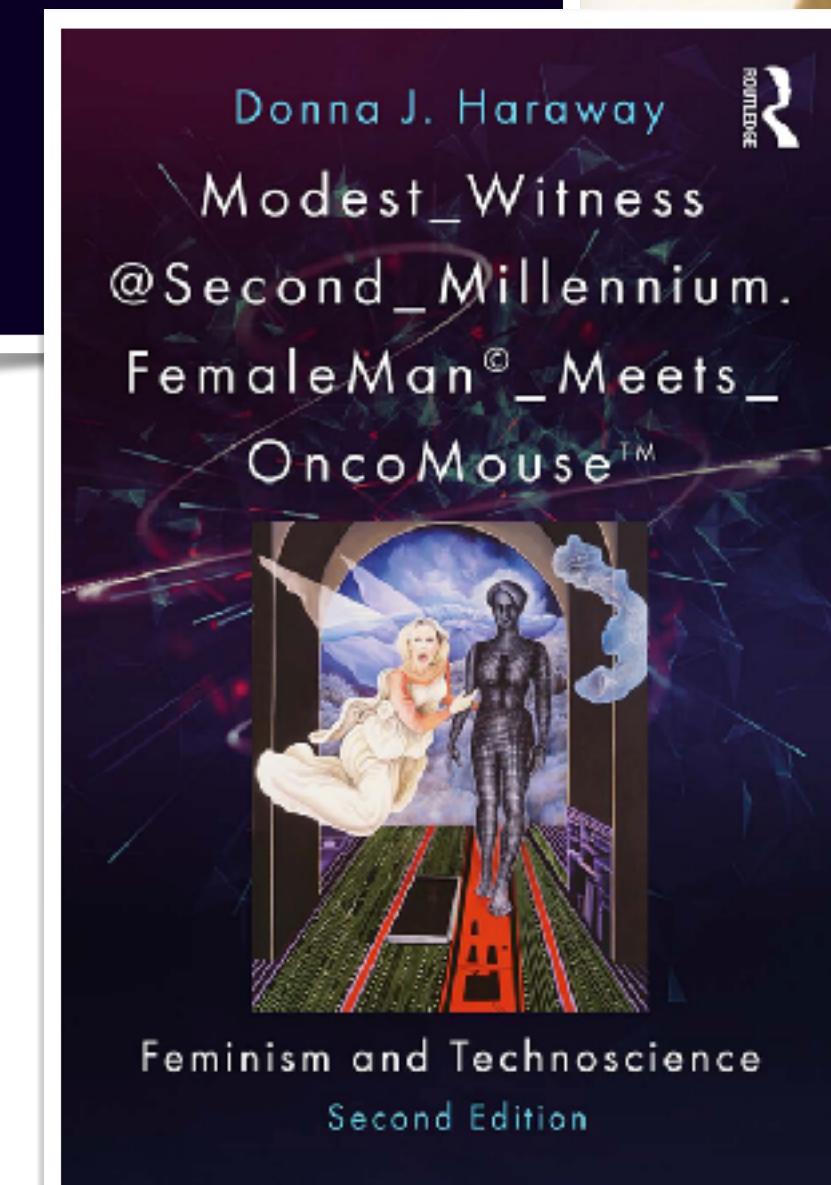
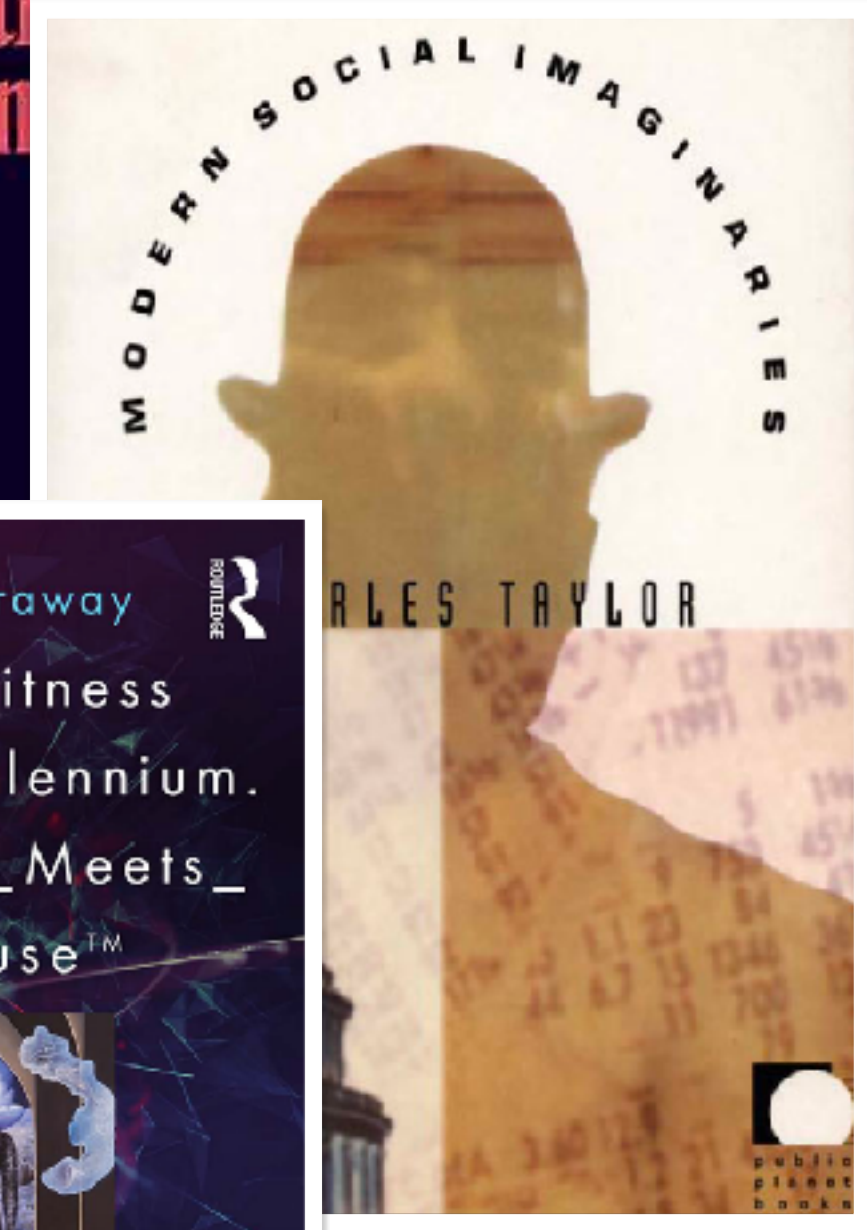
Prefiguration

- ▶ “From its humble beginnings, the imaginary embarked on an unforeseeable career, advancing to a kind of *materia prima* in such spheres as psychoanalysis, anthropology, and, in recent times, social theory.” (Iser, 1993, p. 231)
- ▶ German translation:
 - ▶ “...that **the imaginary embodies a final horizon from which to think.**“ (Iser, 1993, p. 351)
- ▶ Our view on the world is **prefigured** through culturally shared imaginaries



Refiguration

- ▶ Imaginaries create „figures/forms/images **[sifni]**, on the basis of which alone there can ever be a question of ‘something’. **What we call ‘reality’ and ‘rationality’ are its works.**“ (Castoriadis, 1975, S. 3)
 - ▶ Example: *capitalist economy* converts to '**concrete' objects** (the goods produced, the instruments of production, banks, etc.) and '**abstract' significations** like capital, stocks, labour wages, commodities, etc. (p. 362)
 - ▶ Act of voting and demonstration in a democracy (Taylor, 2003)
 - ▶ **Materialized Refiguration** „Technoscience traffics heavily in the passages that link stories, desires, reasons, and material worlds.“ (Haraway, 1997,
- ▶ Imaginaries **refigure** our world, as they guide our actions



Configuration

- ▶ „The fictionalizing act is a guided act. It aims at something that in turn **endows the imaginary with an articulate gestalt** – a gestalt that differs from the fantasies, projections, daydreams, and other reveries that ordinarily give the imaginary.” (Iser, 1993, p. 3)
- ▶ **Robotic imaginary** (Rhee, 2018)
 - ▶ Frankenstein Complex (McCauley, 2007),
 - ▶ Companion (Grunwald, 2016)
- ▶ Imaginaries are **configured** through their gestalt/medium/form
 - ▶ Obeying aesthetics, design coventions, audience, authors intention, context, etc.
 - ▶ Media Theory: Decoding / Encoding (Hall, 1973)



R.U.R. - Rossum's Universal Robots (Karel Čapek, 1920)



Elektro & Sparko (Westinghouse Electric Corporation, 1940)

Iser, Wolfgang. 1993. *The Fictive and the Imaginary: Charting Literary Anthropology*. Baltimore: The Johns Hopkins University Press.

Rhee, Jennifer. 2018. *The Robotic Imaginary: The Human and the Price of Dehumanized Labor*. 1. Aufl. Minneapolis: Univ Of Minnesota Press.

McCauley, L. 2007. „The Frankenstein Complex and Asimov's Three Laws“.

Grunwald, Armin. 2016. „Robots: Challenge to the Self-Understanding of Humans“. in *The hermeneutic side of responsible research and innovation, Responsible research and innovation set*. London, UK: Hoboken, NJ, USA: ISTE; Wiley.

Technofutures

Technofutures as imaginary signifiers

- ▶ ... are mediated **narratives of future worlds shaped by NEST** (Grunwald, 2012; Lösch et al., 2019, Swierstra & Rip, 2007)
 - ▶ These include: Presentations, Foresight reports, Science-Fiction, Advertisement, Company visions, etc.
 - ▶ Usually consists of two imaginaries: The **Novum** and an **Imaginary World** (If and then, Nordmann, 2007)

- ▶ Mimetic Circle (Ricoeur, 1984)
 - ▶ Mimesis 1: they are **prefigured**, as **social texts** they hold the socially shared imaginaries of a present culture.
 - ▶ Mimesis 2: they are **configured**, as they follow the restrictions of the medium, the context of their reception, the target audience, the intentions of the authors, the emplotment of the narrative, etc.
 - ▶ Mimesis 3: they **refigure** our present, despite being fictional they shape technological processes through the discourse or as visions (Leitbilder) that guide the development (sociotechnical impact).

Swierstra, Tsjalling, und Arie Rip. 2007. „Nano-Ethics as NEST-Ethics: Patterns of Moral Argumentation About New and Emerging Science and Technology“. NanoEthics 1(1):3–20. doi: 10.1007/s11569-007-0005-8.

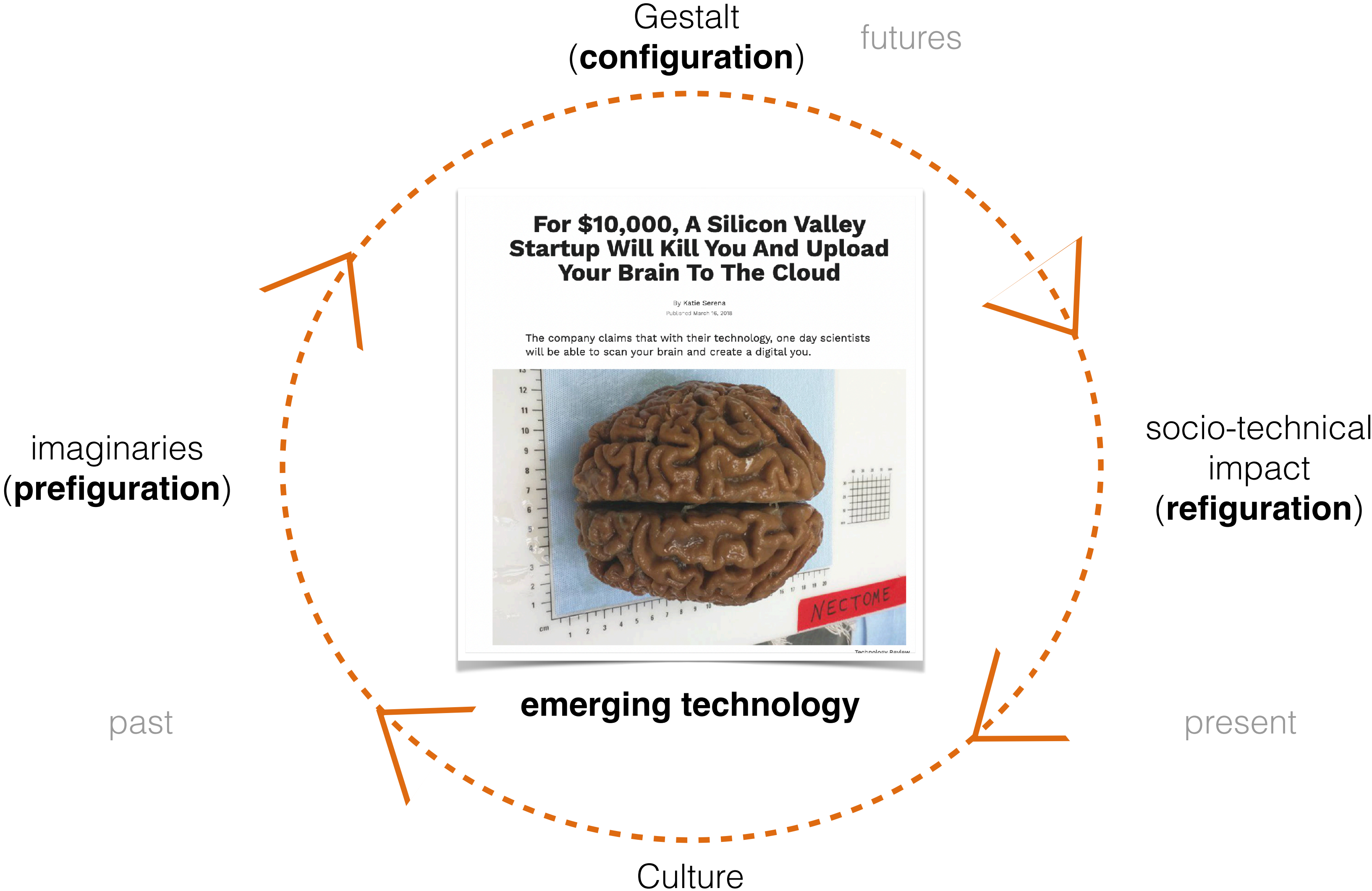
Lösch, Andreas, Armin Grunwald, Martin Meister, und Ingo Schulz-Schaeffer, Hrsg. 2019. Socio-Technical Futures Shaping the Present: Empirical Examples and Analytical Challenges. VS Verlag für Sozialwissenschaften.

Grunwald, Armin. 2012. Technikzukünfte als Medium von Zukunftsdebatten und Technikgestaltung. Karlsruhe: KIT Scientific Publishing.

Nordmann, Alfred. 2007. „If and Then: A Critique of Speculative NanoEthics“. NanoEthics 1(1):31–46. doi: 10.1007/s11569-007-0007-6.

Ricoeur, Paul. 1984. Time and Narrative, Volume 1. University of Chicago Press.

Technofuture Upload your mind to the cloud



Emerging Technology ATUM-SEM

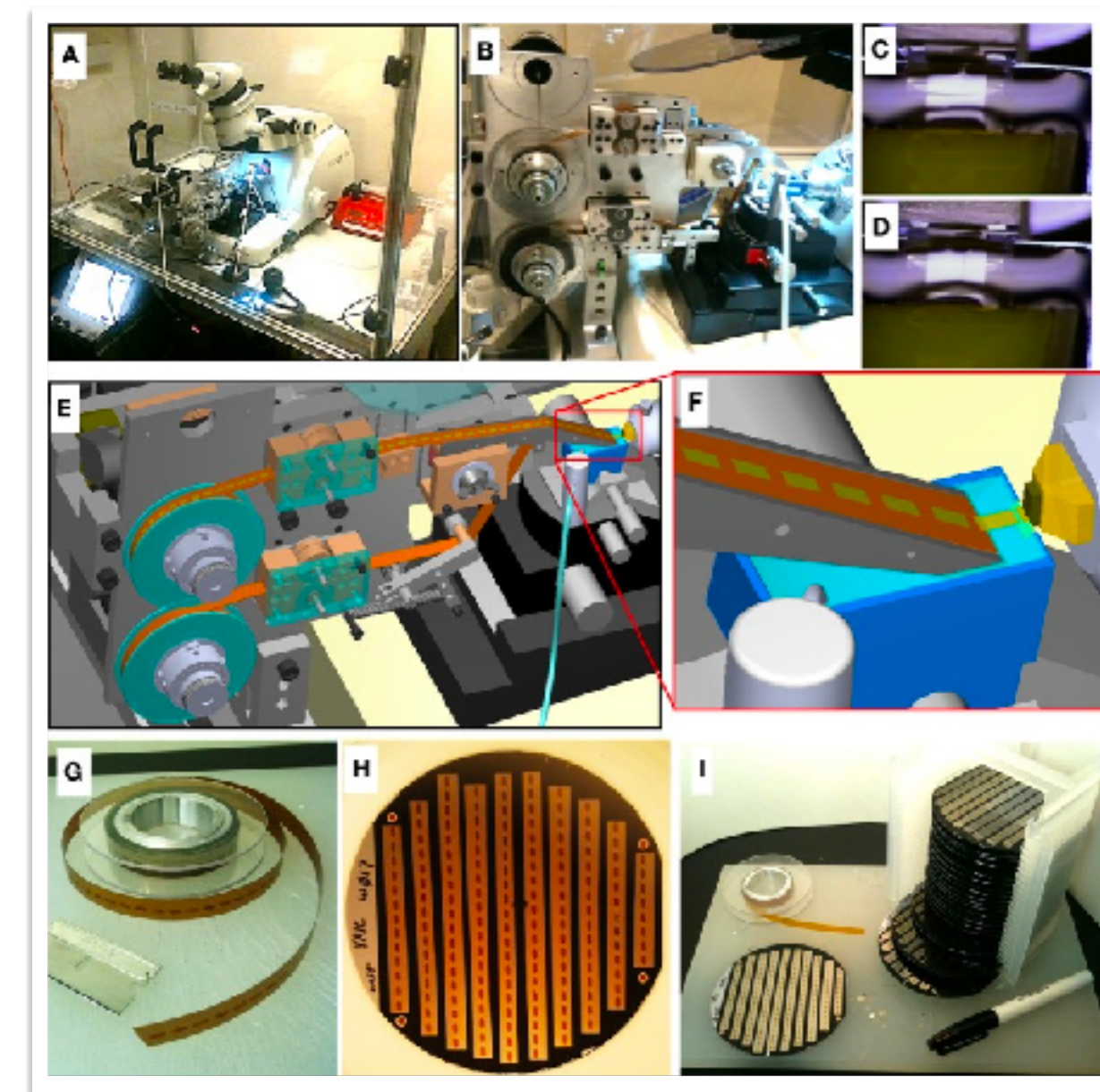
- ▶ Automatic Tape-collecting Ultra-Microtome Scanning Electron Microscopy

"The patient's **plastic embedded brain** and spinal cord is then taken to an automated sectioning machine which uses incredibly **sharp diamond knives** to slice her brain into **long strips just 100 microns thick**, and these strips are collected on long spools of tape. (...) Once all the brain strips have been imaged via this destructive process our patient's original physical brain and spinal cord will have been completely destroyed, but a **5x5x5nm resolution volume image of her entire brain and spinal cord will have been acquired in the process.**" (Hayworth, 2010, p. 4)

- ▶ Imaginary that is attributed
 - ▶ Mind-Upload



<https://www.cbc.ca/radio/quirks/may-5-2018-preserving-brains-for-uploading-coral-reefs-sound-sick-south-american-child-sacrifice-and-more-1.4647066/preserving-your-brain-might-kill-you-but-it-could-help-you-live-forever-1.4647089>

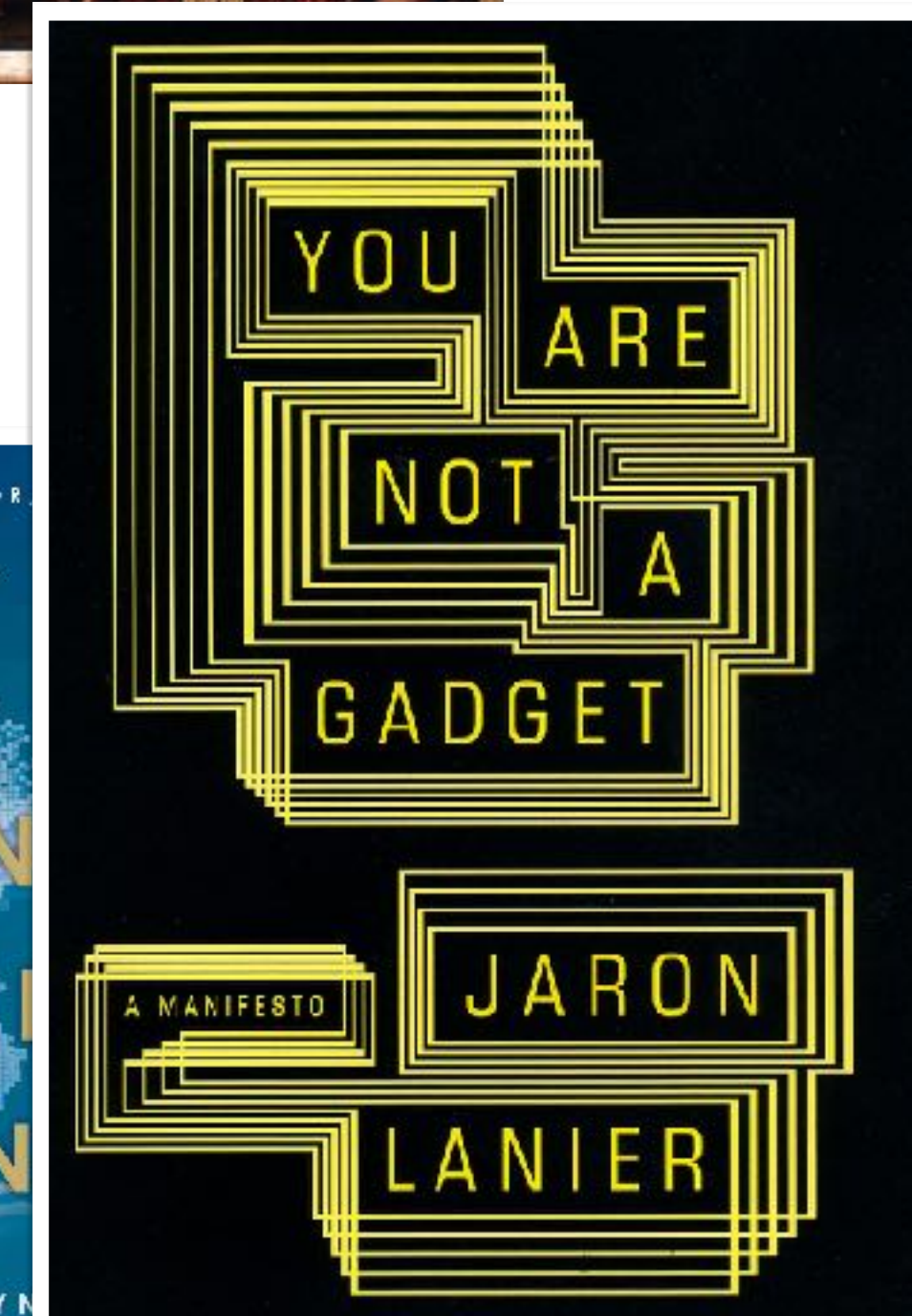
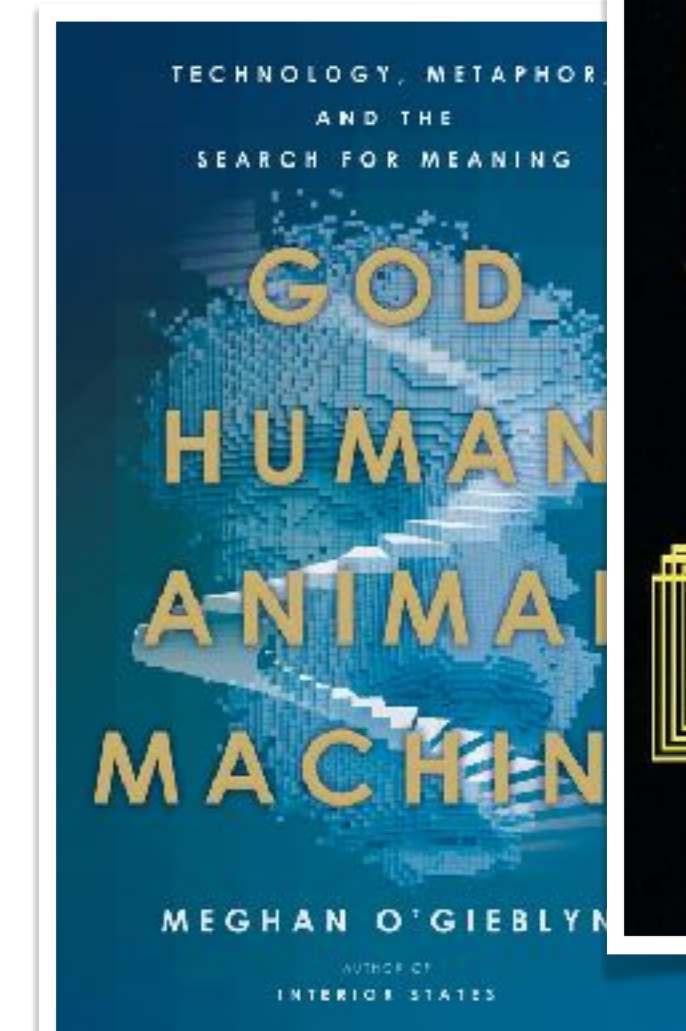


https://www.researchgate.net/publication/263898872_Imaging_ATUM_ult_rathin_section_libraries_with_W_aferMapper_A_multi-scale_approach_to_EM_reconstruction_of_neural_circuits

Prefiguration Upload in the cloud

- ▶ Metempsychosis: The transmigration of the soul and its reincarnation after death
 - ▶ „And the dead in Christ shall rise first; then we who are alive and remain **shall be caught up together with them in the clouds** to meet the Lord in the air. And so shall we ever be with the Lord.“ (Thessalonians 4:16-18)
 - ▶ „Heaven is a really powerful computer“ (Seung, 2012, p. 254)

- ▶ „But if you want to make the **transition from the old religion**, where you hope God will give you an afterlife, **to the new religion**, where you hope to become immortal by getting uploaded into a computer, then you have to believe **information is real and alive.**“ (Lanier, 2011, p. 23)



O'Gieblyn, M. (2021). God, Human, Animal, Machine: Technology, Metaphor, and the Search for Meaning. Doubleday.

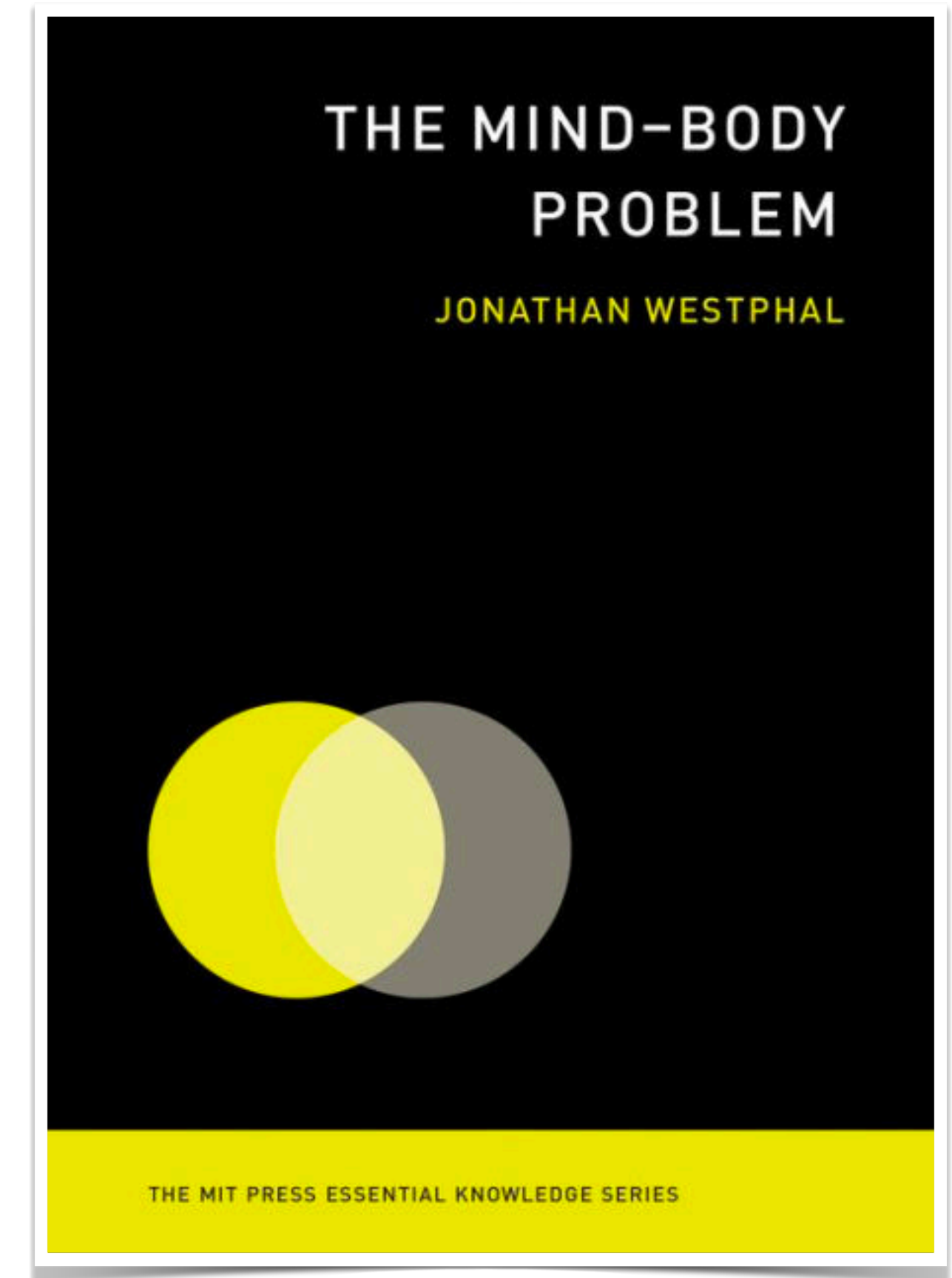
Lanier, Jaron. 2011. You Are Not a Gadget: A Manifesto. Reprint Edition. New York: Vintage.

Seung, Sebastian. 2012. Connectome: How the Brain's Wiring Makes Us Who We Are. Boston: Houghton Mifflin Harcourt.

The Last Judgment (Jean Bellegambe, 1523)

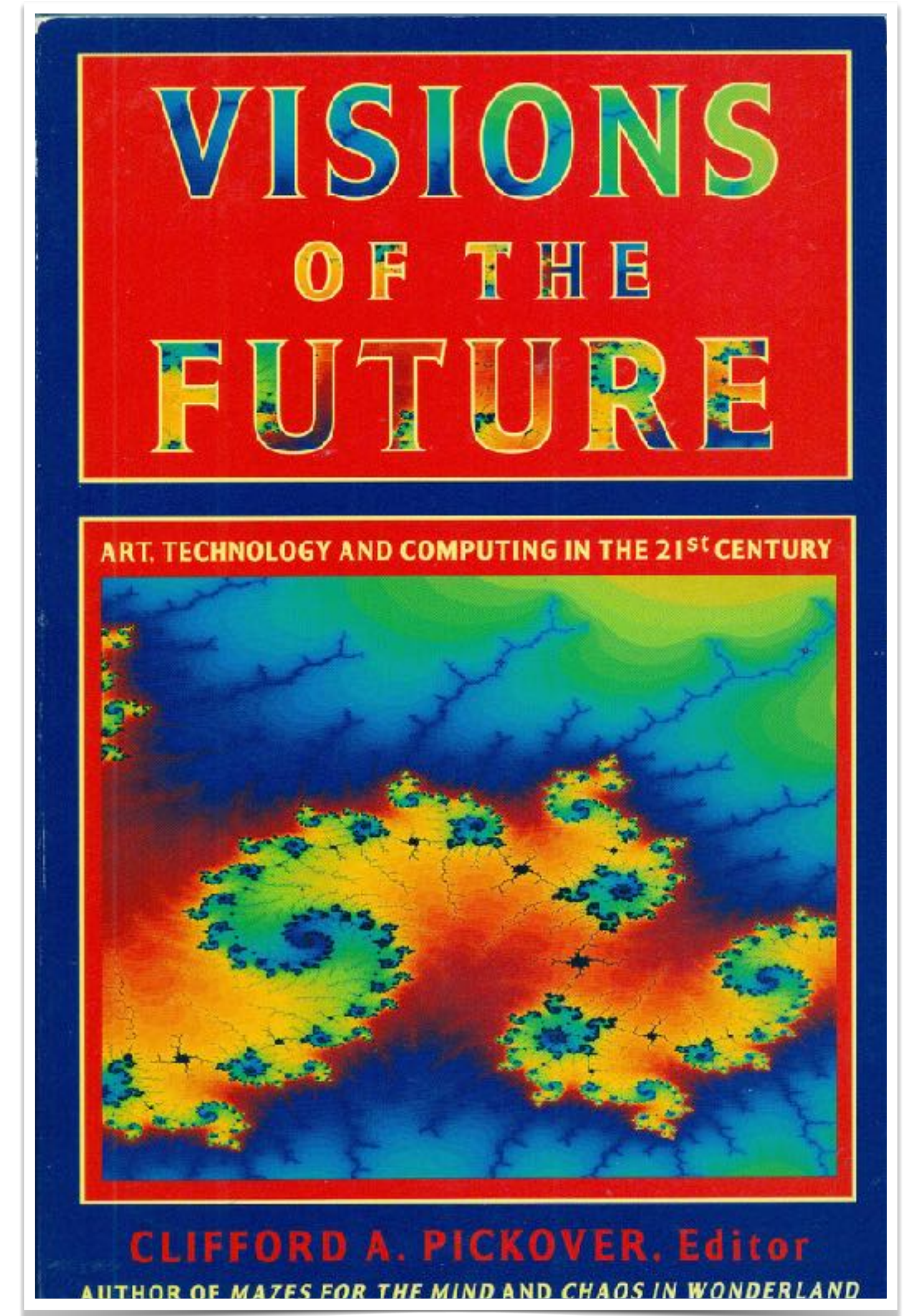
Prefiguration Imaginary of Mind-Body Problem

- ▶ Philosophy of mind: Functionalism (Putnam, 1960).
- ▶ A person's mind is **independent of the substrate that houses it**:
 - ▶ The carrier of the mind can be **replicated with alternative components**. Since the replica achieves the identical results as the original, independent of the substrate, it also replicates its function.
 - ▶ Thus, if one assumes that the mind is located in the brain, and that the functions of the brain (the connection of the neurons, the identical exchange of information between the neurons, etc.) can be simulated or replicated with another substrate, **the mind can be replicated, since it emerges through the functions of the brain.**



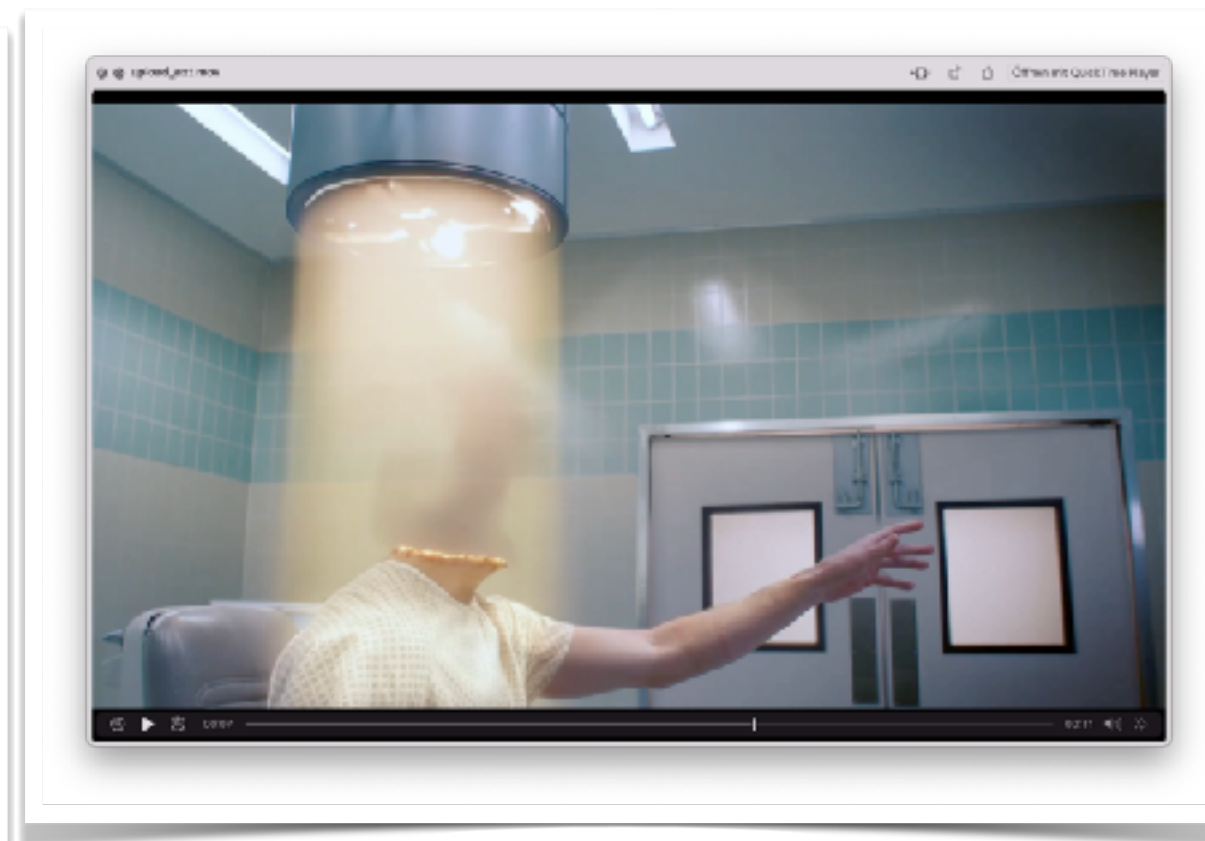
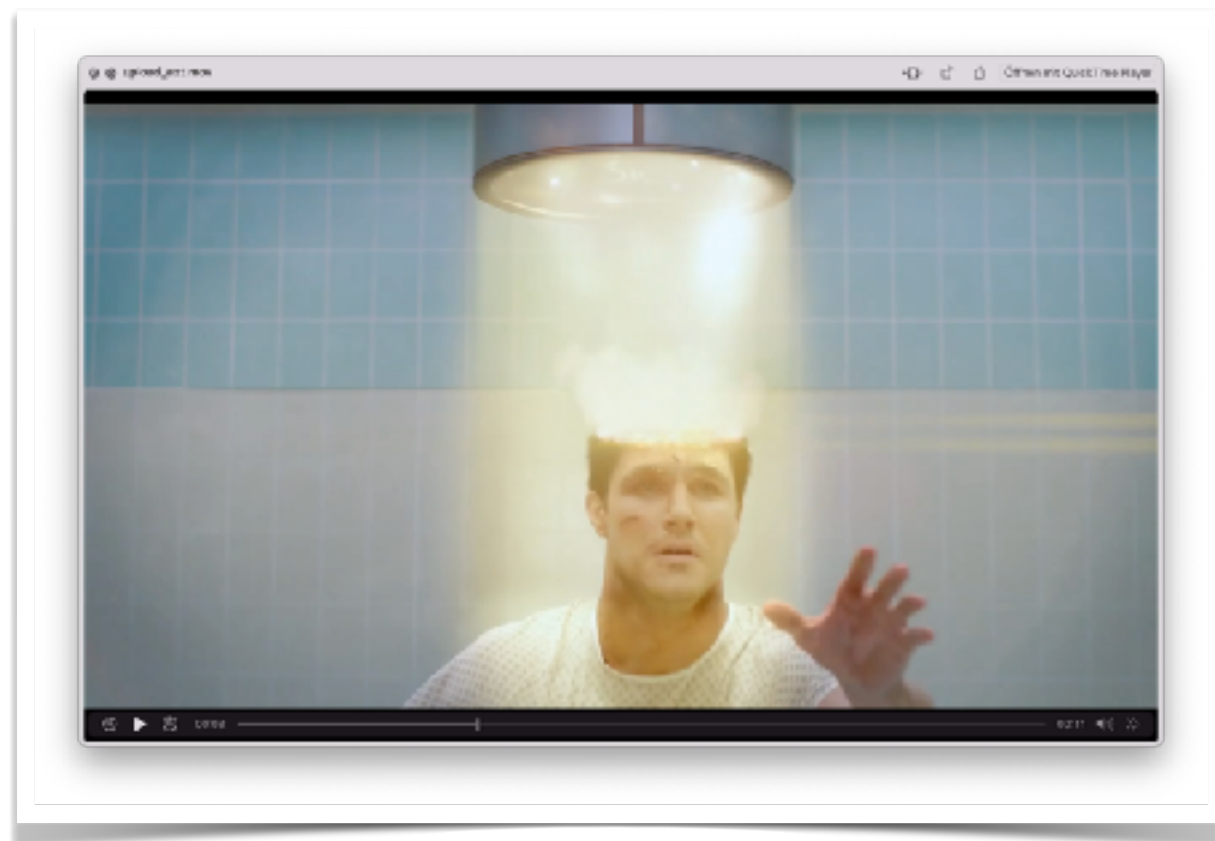
Prefiguration Transhumanism

"**Layer after layer the brain is simulated, then excavated.** Eventually your skull is empty, and the surgeon's hand rests deep in your brainstem. Though you have not lost consciousness, or even your train of thought, **your mind has been removed from the brain and transferred to a machine.** In a final, disorienting step the surgeon lifts its hand. Your suddenly abandoned body dies. For a moment you experience only quiet and dark. Then, once again, you can open your eyes. Your perspective has shifted. The computer simulation has been disconnected from the cable leading to the surgeon's hand and reconnected to a shiny new body of the style, color, and material of your choice. Your metamorphosis is complete." (Moravec, 1991, p. 65)

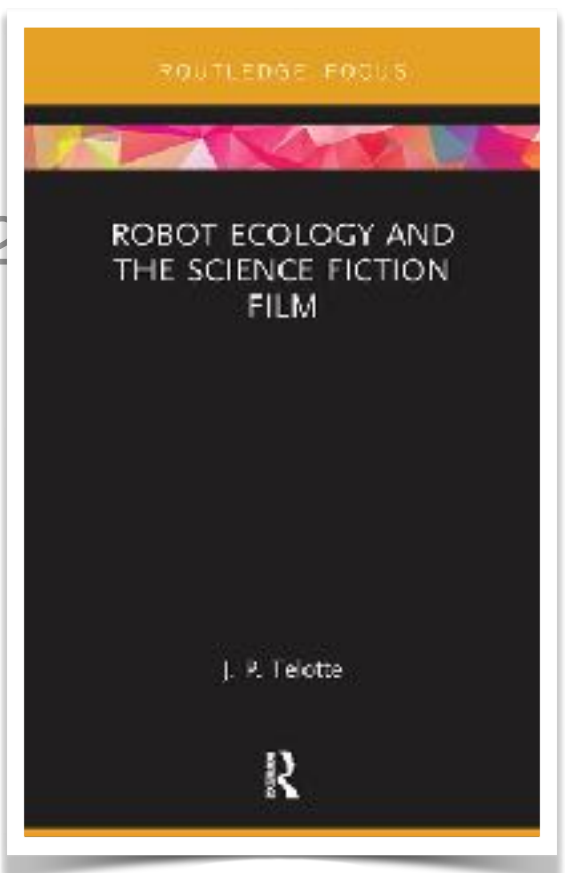
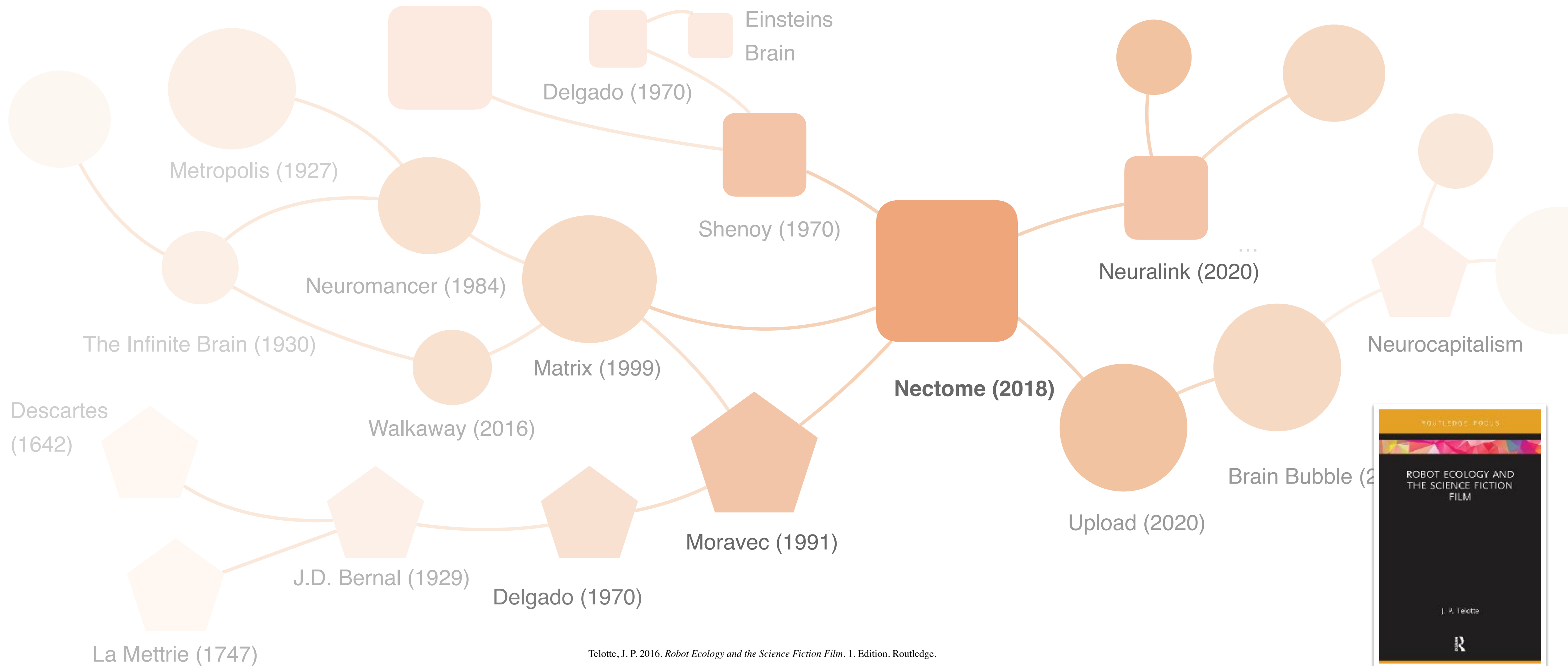


Prefiguration Popular Culture

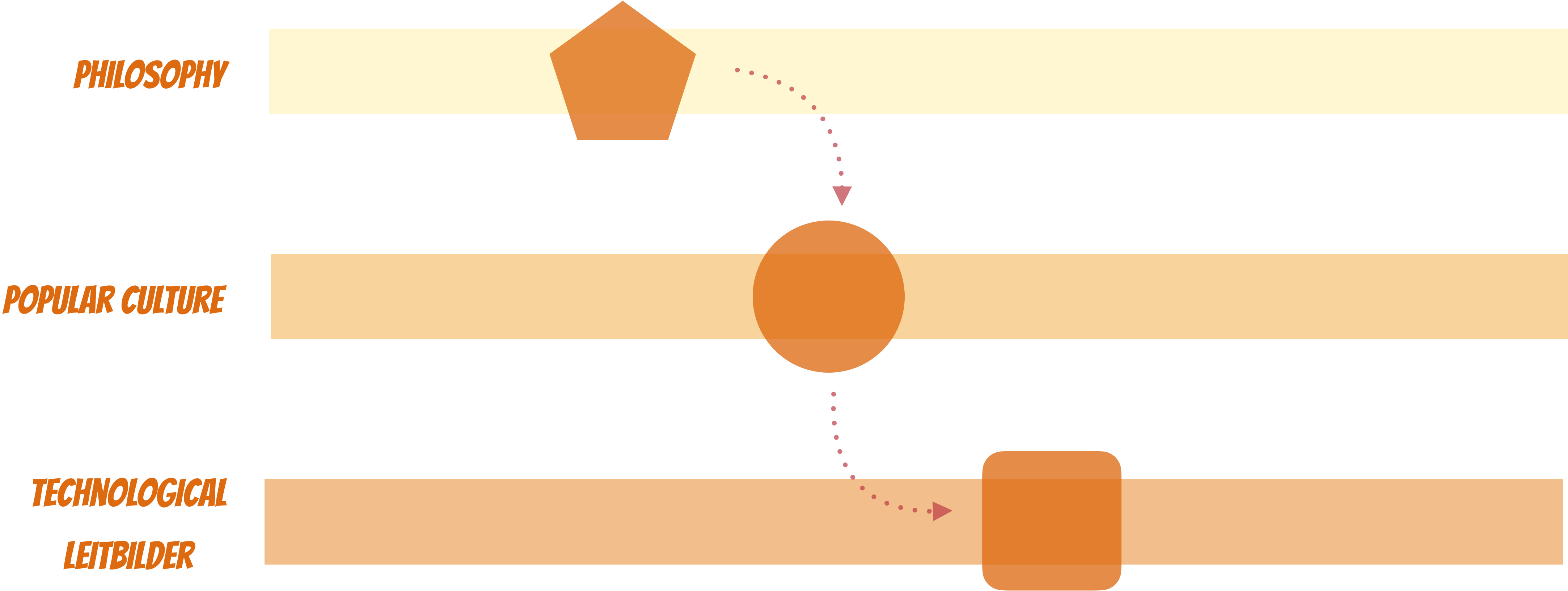
- ▶ Upload (Daniels, 2020)
- ▶ Excavating the brain
- ▶ Creating a digital simulation of your mind
- ▶ Discussing potential ethical implications such as power dynamics, ethical challenges, capitalist structures, etc.



Mindupload Ecology Circulating Imaginaries (Telotte, 2016)

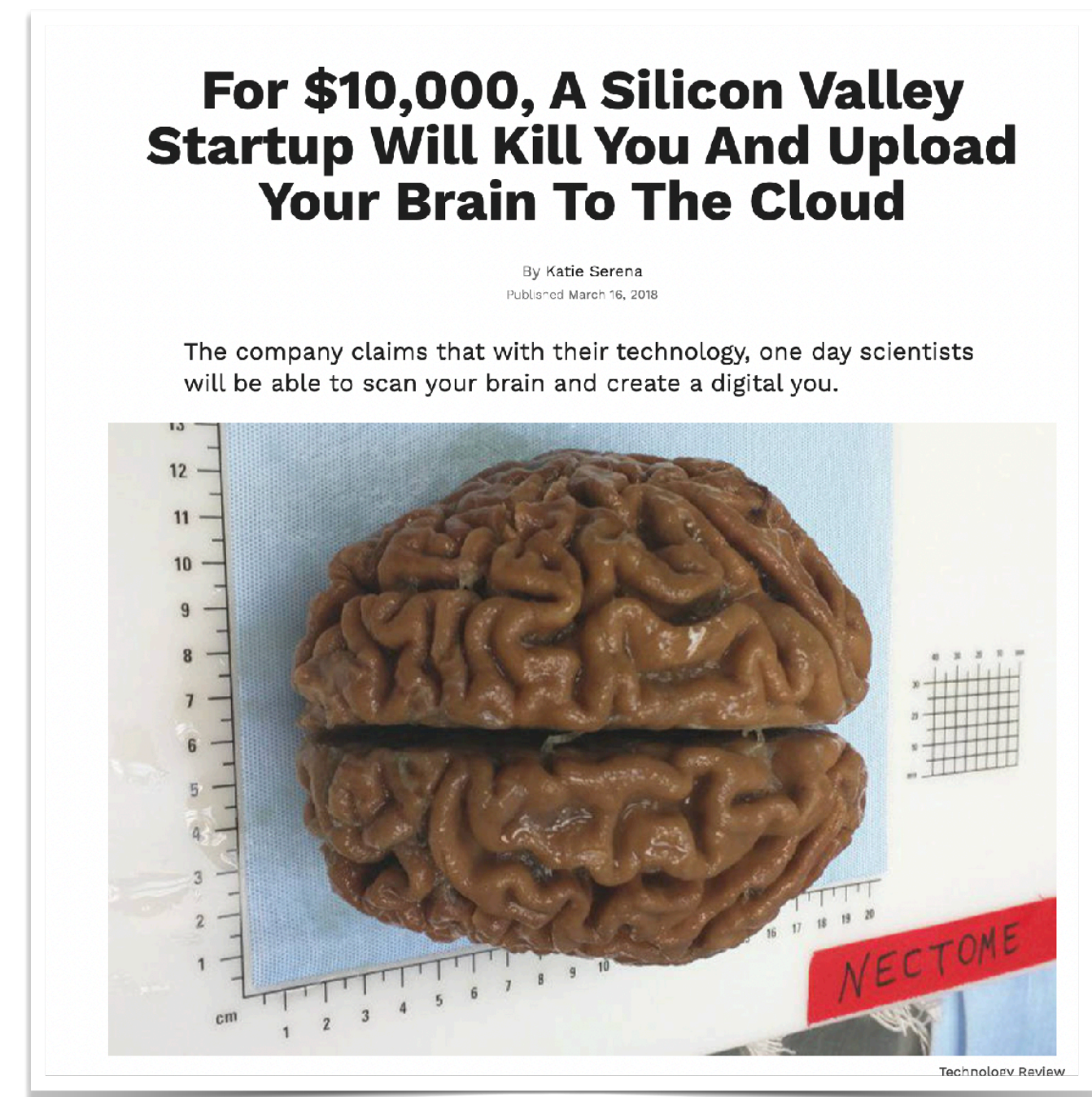


Configuration morphing imaginaries



Configuration Brain Banking (Nectome, 2018)

- ▶ “Any suggestion that you can come back to life is simply **snake oil.**” (Hendricks, 2015)
- ▶ \$960,000 federal grant from the U.S. National Institute of Mental Health.
 - ▶ „These technologies for whole-brain analysis are a vital step towards deep understanding of the mind and of many brain diseases.“ (proposal text)
- ▶ Collaboration with MIT
 - ▶ “Neuroscience has not sufficiently advanced to the point where we know whether any brain preservation method is powerful enough to preserve all the different kinds of biomolecules related to memory and the mind. **It is also not known whether it is possible to recreate a person’s consciousness.**” (Boyden, 2018)
- ▶ Commodification of Mind-Upload imaginary
 - ▶ **Marketing** Creating hype and attention through provocative statements
 - ▶ „But the company has found a way to test the market.“ (Charles, 2018)



Charles (2018) <https://brobible.com/culture/article/billionaire-pays-10k-brain-uploaded-cloud/>

<https://www.technologyreview.com/2015/09/15/109906/the-false-science-of-cryonics/>

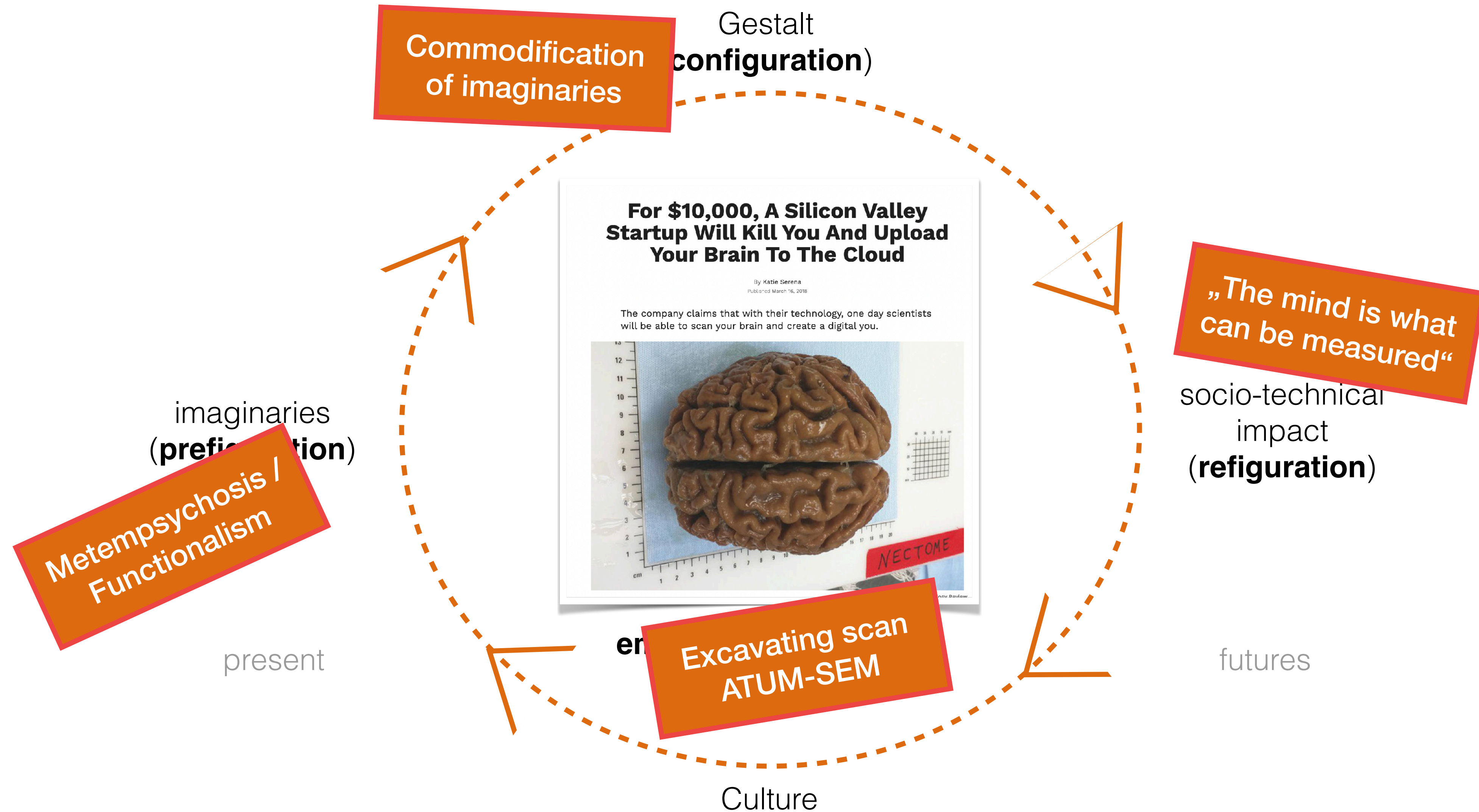
E. Boyden, Statement regarding the relationship between the MIT Media Lab and Nectome, 2018, accessed 04.11.22, <https://www.media.mit.edu/posts/the-media-lab-and-nectome/>

Refiguration Human Mind

- ▶ Contributes to an ongoing discourse and constructs an abstract signifier
 - ▶ The technology can measure the mind,
 - ▶ Thus the mind is what the technology can measure.
- ▶ Refiguration of the imaginary of the human mind.
- ▶ Technomorphisation of the human body
- ▶ Mind as information



Technofuture Upload your brain to the cloud



Wrap Up and Take Away

- ▶ This approach...
 - ▶ ... structures a hermeneutical technology assessment
 - ▶ (1) prefiguration, (2) configuration and (3) refiguration
 - ▶ ... contextualises technofutures and cuts away the glossiness of hype and marketing
 - ▶ ... reflects the imaginaries, cultural context, wishes and hopes – not the technology
 - ▶ ... allows discussing not the plausibility but the preferability of the depicted future
 - ▶ ... reminds us on the immanence of the present (Grunwald, 2012, p. 99)

Thank you!

- ▶ For more:
 - ▶ „Die Ästhetik kommodifizierter Mind-Upload-Visionen“ in *Die Ästhetik der Technowissenschaften des 21. Jahrhunderts* (Wbg Verlag) Editor: Dr. Marco Tamborini (Forthcoming)
 - ▶ „Hermeneutical TA“ in *International Handbook of Technology Assessment* Editor: Armin Grunwald (Forthcoming)
- ▶ Or come in contact:

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TU Berlin // Berlin Ethics Lab