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PORTO

## THE NOSTALGIA ALGORITHM

Examining the Interplay of Hauntology, Technology, and  
Collective Memory in the Anthropocene



Dissertação apresentada à Universidade Católica Portuguesa  
para obtenção do grau de Mestre em Som e Imagem

*Maya Hershey*

Porto,

21 December 2023



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- Especialização em Design de Som-

*Maya Hershey*

Trabalho efetuado sob a orientação de  
Prof. Doutora Cristina Sá

Porto,

21 Dezembro 2023

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I am also deeply thankful to my friends and loved ones. Your constant support and encouragement have been indispensable to the completion of this work.

## Abstract

The essence of this research revolves around *anthropos* as an archetype of melancholia, positioned as the universal subject at the center of all contemplations. This anthropocentric perspective has led humans to a false sense of centrality, grappling with deep anxieties in a rapidly deteriorating world. *Anthropos* embodies a reductionist paradigm that favors a universal, technologically-driven future in pursuit of Promethean absolution. This research foregrounds the ancient narrative underpinning our current technological ethos and highlights the melancholia stemming from the dichotomy of such discourse.

*Anthropos*, in its planetary reach, amplified by AI and capitalism's extractive mechanisms, faces a critical juncture as the planet continues to respond. This collective identity, central to *anthropos*, has laden humanity with profound environmental guilt. In the process, the richness of pluralistic perspectives and injustices are lost, subsumed under a universal, homogenized identity. This loss engenders a nostalgic torment, not merely for what has been lost, but for the inability to recall in the midst of a complete reconfiguration of social memory. Algorithms restructure the world's plurality into alien computational ontologies, diluting memories of what once was. This phenomenon is what we term the '*nostalgia algorithm*.'

Confronted with this technological constraint, humanity is thrust towards an inevitable fate, embodied in the culmination of *anthropos*. This monstrous figure, having reached its peak without deviation from its path, signifies widespread destruction as a form of self-preservation. In this ultimate amalgamation, all histories, possibilities, and pluralities implode into a singularity.

**Keywords:** Nostalgia algorithm, Centrality of humans, Reconfiguration of social memory, technics, Loss of pluralism, Promethean pursuit, Planetary, Technological ethos, Myth, Data mediation, Anthropos, Computational Thinking

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*This collage visually interprets Peter Sloterdijk's concept of the human being's development as inherently linked to the creation of "spheres" – protective environments and insulative spaces developed through technological means. The central image of a human head enclosed within a sphere, floating above three jellyfish-like structures, symbolizes these anthropogenic incubators. These "spheres" serve as essential mechanisms for self-domestication but they also end up isolating humans from the surrounding living and non-living world.*

### [Figure 2. “Exploding of the Sky”, Collage work using vintage illustrations](#)

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*The collage visually explores Walter Benjamin's reflections on Friedrich Nietzsche's philosophies and his notion of the "exploding of the sky through enhanced humanness," where the Übermensch is conceptualized as the historical human who has reached its zenith without altering its ways. This is achieved through optimization (Steigerung) or the ever-increasing intensification of human-ness.*

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*This collage visualizes a new understanding of human life, where social memory becomes attuned to both human creatureliness and the abstractions and mediations brought forth by machines.*

## Chapter 1: Introduction

I believe that it is very difficult to truly understand the melancholia of our contemporary age without directly confronting the question of technology. In an era saturated with ever-present technologies, alongside nostalgic reiterations and exhausted memories, the critical question emerges: what future memories are we able to produce? This research suggests a need for a more comprehensive exploration of technology and its intersections with contemporary thoughts and memory, one that transcends linearly written perspectives and acknowledging the role of history as a “mediated” discourse that bears power struggles, ideologies, and philosophies of thought.

At the core of this research is *anthropos*, the archetype of the humanist subject, which seeks to question this very traditional notion of humans at the center of all contemplations. In this anthropocentric construct, humans have falsely positioned themselves at the center, grappling with pervasive anxieties amidst a rapidly eroding world. This crisis is marked by *anthropos*' reductionist paradigm of homogeneity where historical specificity and cultural multiplicities are both negated in favor of a universalizing, technologically-determined future, driven by the relentless engines of Promethean progress.

In its various incarnations—human, divine, monstrous, and artificial—the figure of Prometheus, a myth resounding with tragic irony that persists to this day, became an archetype of *anthropos*, the universal human. Prometheus, as *anthropos*, echo the inherent melancholy and uncanniness of human existence marked by finitude, interdependency, and the destructive pursuit for the unattainable. The tale of Prometheus, the titan who ascends to Olympus to steal fire from the gods to grant to humanity, symbolizes the gift of knowledge and wisdom (Aeschylus & Kerr, 2005). This primal knowledge, perceived as dangerous in the hands of humans by the divine, spurs Zeus to punish both Prometheus and humanity, entangling them in a grand struggle and inflicting upon them the consequences of wielding this powerful gift.

In this tragic irony, Prometheus, the giver of *techne*, is bound by it, emblematic of the human condition wherein the very origins of our being become the instruments of our undoing. This duality of technology as both enabler and limiter resonates through ages. Prometheus's gift, a hedge against death, ironically intertwines our technological nature with our mortality. Humans, once limited in their stark frailty, are now blessed with the arts and tools, numerical comprehension, abstract reasoning, externalized language, and memory by Prometheus.

This ancient narrative not only lays the groundwork for the present technological ethos that propels the momentum of progress, it also sheds light on the melancholia that lies between the

desire for omnipotence and the stark reality of human finitude. Even as *anthropos* strives to substitute the unpredictable organic world with the certainty of machines, it inadvertently emulates the very world it's trying to escape. In this light, technology becomes a metaphor for the profound structures of thoughts, an archetype of experience, and a reservoir for the unconscious (Wilson, 2006).

### *1.1 On Hauntology: Thinking with Ghosts*

In this research, hauntology unfolds as a crucial lens for navigating complex themes like memory, the unconscious, and machine abstractions. Amid our constant engagement with the tangible, the unseen or *the absent* emerges as a repository of answers challenging linear and conventional thought patterns. For this reason, hauntology is borrowed as an essential framework, providing a lens to examine the invisible forces that shape our world.

Hauntology, a term coined by French philosopher Jacques Derrida in the early 1990s, merges the worlds of both the *haunting* and the *ontological*. It explores the persistent echoes of cultural and social pasts, mirroring spectral reverberations. Initially, Derrida used hauntology to dissect Marxism's enduring and atemporal impact on Western society (Derrida, 1994). Over the years, the term evolved, resonating with diverse domains, including music, aesthetics, political theory, architecture, and various futurist and modernist movements, reflecting its multifaceted application (del Pilar Blanco & Peeren, 2013).

In this exploration, I borrow Mark Fisher's understanding of hauntology, in what he calls *the agency of the virtual or the absent*, wherein spectres and other non-corporeal entities, stripped of supernatural connotations, act without physical existence, symbolizing active and effective virtualities (Fisher, 2014, 18). The research exercises interchangeably between four hauntological perspectives or ways to *think with ghosts*:

1. **Hauntology and Psychoanalysis:** Dubbed the 'science of ghosts,' by Derrida (Fisher, 2014, 18), psychoanalysis explores a world, known as the horizontal dimension, which encapsulates the unseen exchanges between individuals, transcending the barriers of active, conscious communication. The intertwined nature of hauntology and psychoanalysis is a multilayered one, where the tangible and intangible overlap, leaving ghostly traces within the corridors of the mind. Psychoanalysis explores these traces, highlighting the profound impact of non-physical presences (Frosh, 2012, 243). In our contemporary context, the intertwining of hauntology and psychoanalysis assumes a significant role as it grants insight into a complex sentiment such as melancholia and its double-dealing effect.

2. **Hauntology in the Age of Media Technologies:** This dimension underlines hauntology's amplified significance within the realm of contemporary media technologies. As emerging technologies continue to collapse both spatial and temporal boundaries, they leave behind an oversaturated cyberspace, intensifying the relevance of hauntological analysis (Fisher, 2014, 20). Here, hauntology serves as a valuable tool in navigating the corridors of cyberspace, technology, and time, exploring the non-linear, multilayered temporalities within our technologically conditioned reality from the lightning-fast computations of artificial intelligence to the expansive stretch of geological time (Herzogenrath, 2012), as will be explored in chapter 2.
3. **Ghosts as Liminal Figures within Technology and Society:** Ghosts, often illustrated as quintessential liminal figures in their *neither present nor absent* state, existing in the world but in a non-corporeal form, symbolize the ambiguous entities of technology - androids, cyborgs, and others (Thompson, 2019, 46). This liminality makes them symbolic of our societal shifts and transformations, especially as we navigate the uncertainty of a future intertwined with artificial intelligence and computation. Technology, or *technics*, in this context could then embody this ghostly liminality, mirroring shifting philosophies and contemplations across cultures. Consider the contrasting perspectives on souls in different cultural contexts. Abrahamic traditions typically hold human-centric ideas of "souls". In contrast, Japan's rich religious makeup of Shintoism, Confucianism, and Buddhism embraces a broader view, and acknowledges the presence of souls in non-human entities, including inanimate objects such as robots and automata or even clothes or stools. (Thompson, 2019, 48).
4. **The Ethical Dimensions of Ghost Stories:** Beyond their ethereal existence, ghosts illuminate an ethical dimension, offering voice to the oppressed and recounting tales of moral transgressions. Ghost stories present alternate histories, standing in contrast to the narratives penned by oppressors or victors, and underscoring the cosmic consequences of ethical failings (Thompson, 2019). In this study, the ethical dimensions are primarily examined within the framework of the homogenization of *technics* brought forth by the Enlightenment project and the global axis of time (Hui, 2019).

In the progression of this research, a number of questions emerge to explore the entanglement between humans and their technical milieus. Such an exploration necessitates a synthesis between the essence of *anthropos* and the essence of modern technology as posited by Martin Heidegger: What does modern *technology* reveal about *anthropos*, as a way of being? In this light, how did the Promethean titan transform from an ancient myth to an archetype of *anthropos*

and a spectre driving relentless technological progress that have culminated in an environmental devastation? Is our cultural impasse, then, one of mere exhaustion or a melancholic disappointment towards a future no longer imaginable amidst the all-encompassing ecological crisis of the Anthropocene? How is such an epoch, centered around the entrenched views of the humanist subject and its linear historical narratives, clashing with the heterogenous plurality of the world? Could such an inquiry assist in disengaging the emphasis on the individual subject within various discussions and considerations? Lastly, how has the integration of various technical milieux into a global digital framework impacted the preservation and expression of social memories?

Our exploration extends from an in-depth examination of the Prometheus myth, beginning with its earliest known renditions to its philosophical reimaginings by the Renaissance humanists, transforming the titan into an *archetype of the universal human*, or *anthropos*. By engaging with philosophers like Martin Heidegger, Sigmund Freud, and Walter Benjamin I explore the uncanny and homeless nature of *anthropos*, and its self-destructive pursuit of the unattainable. Furthermore, I aim to deconstruct the underlying logic of the '*anthropos*' in the Anthropocene through a reassessment of humanity's relationship with the non-human world and the broader ecological systems it inhabits with contemporary philosophers like Bernard Stiegler, Peter Sloterdijk, among others.

Moreover, the intensified exteriorization of explicit memory, accelerated by contemporary technologies, ironically becomes the cause of forgetting. This dissertation examines the amalgamation of diverse technical environments into a singular global digital milieu, transforming complex social recollections into a homogeneous, algorithmically governed narrative.

## *1.2 On Methodology: Qualitative, Observational, Collaborative*

### *1.2.1 Research Design & Approach*

In our pursuit of understanding the intricate interplay between technology, memory, and time, this research touches on a multitude of subjects. However, this research strategically narrows its scope to explore the unique archetypal pattern reflecting how humans have historically related to their notions of “artificiality” and technology, and it consciously limits its focus to machines or technology as manifestations of melancholia. It acknowledges that alternative manifestations exist but confines its examination to this singular, illustrative narrative for depth and specificity in analysis. Moreover, to answer the questions I have raised in the previous section, this research emphasizes a collaborative approach. I integrate the diverse literary review with interviews with

scholars, adopting a qualitative methodology that encompasses observation and semi-structured interviews, or dialogues.

The methodology embraces a qualitative approach because such an orientation was paramount, especially when addressing the question of technology and memory where the critical variables are still in flux and the structures of technological systems like AI are determined largely by power dynamics and shifts. Furthermore, this approach allowed for encapsulating experiences and perceptions of technology from multifaceted academic perspectives, using open-ended interviews as a primary tool. This method empowered the interviewed scholars to offer spontaneous and rich insights, allowing them to traverse their academic landscapes and contribute uniquely to the discourse.

### *1.2.2 Engaging with Scholars: Between Dialogue & Confluence*

Among the scholars consulted were Jason Lahman, Mazen Labban, Pietro Bianchi, and Luis Sarmiento. The criteria to select scholars, as I will explain below in the brief of each engagement, was informed by a multitude of factors such as filling gaps in knowledge, following a multiplicity of understanding through confluence, and the scholars' own willingness to engage in interdisciplinary correspondence and bringing together diverse ideas.

One primary criterion for selecting scholars was the need to fill gaps in knowledge. By engaging with experts in various fields, the research aimed to move beyond reliance on theoretical frameworks and existing bibliographies. This approach sought to encompass additional viewpoints and discourses that rarely intersect. For example, the decision to exclude well-known theorists such as Franco Bifo Berardi, Paul Virilio, Frederic Jameson, Mark Fisher, and others, was deliberate. Their exclusion was based on a desire to diverge from a well-trodden intellectual path and instead explore fresh and less conventional perspectives. By consulting scholars with diverse academic and cultural backgrounds, the research could integrate a wider range of insights, thus broadening the scope of understanding and reducing potential biases inherent in relying solely on established authorities.

Another significant criterion was of "*confluence*," which refers to an alternative form of movement that diverges from traditional causal relationships. In this context, confluence signifies *the intersection or connection of multiple flows of thought, each capable of bifurcation, moving together without directly folding back over themselves* (Nail, 2018). This idea was particularly relevant in exploring complex phenomena such as technological evolution, environmental crises, and sociopolitical changes. By selecting scholars whose work embodies this concept, the research aimed to highlight the interconnectedness and multiplicity of trajectories in these fields.

For instance, the interdisciplinary engagements were designed to reflect how various flows of knowledge and experience intersect, enhancing the depth and breadth of the analysis.

In addition to the above criteria, the willingness and enthusiasm of the scholars to participate in the research played a crucial role in their selection. Some signs were too significant to ignore, and reaching out to the aforementioned scholars, who showed a readiness to engage in conversations that brought together a multitude of ideas, was part of the criteria. From the 10 scholars contacted, the aforementioned graciously accepted. This openness and collaborative spirit was essential for enabling such an integrative research environment. The scholars' acceptance to engage highlighted their recognition of the importance of interdisciplinary dialogue, thereby enriching the research with their unique perspectives and expertise.

Convening, transcribing, and analyzing the dialogues spanned four months between June and September. A conscious effort was made to let the scholars steer the discussions, ensuring a free-flow of ideas, so some of the interviews were conducted without the constraints of predetermined questions. However, there were guiding questions and themes that helped initiate the conversations, particularly pertaining to the scholars' own works and publications. Therefore it was very necessary to study and review the scholars' works before each interview, and in the case of Jason Lahman and Mazen Labban, incorporate their works into the literature review process.

Jason Lahman's historical approach, coupled with his expertise in design and technology, provided a foundational understanding of the global impact and cultural intersections of technological advancements. My introduction to Lahman's work was through attending his illustrated lecture *Gendering the Living Machine: A Psycho-Cultural, Techno-Historical Exploration* hosted by *Morbid Anatomy* which looks into the evolving dynamics of gender, desire, sexuality and power in how artificial life forms are both created and perceived. Upon sharing my proposed questions and discussion themes, Lahman pinpointed the limitations inherent in examining these topics solely from a Western perspective. In response, he proposed an alternative approach—a comprehensive, four-week-long course on the cultural history of automata he was giving, a series of face-to-face and zoom discussions that expanded beyond the traditional interview format, and additional bibliography. Our interactions were more of a progressive study rather than mere interviews.

After the course, Lahman and I examined our findings, recognizing the residues of historical thought that continue to reverberate within our contemporary context that may have contributed to the emergence of groundbreaking technologies such as AI. This comprehensive course encouraged me to contemplate research from a non-Western perspective, shedding light on

crucial missing links in the discourse. It also helped bridge gaps in my understanding, providing me a solid foundation for subsequent discussions with him and other scholars. I chose to present the culmination of insights established from my engagement with Jason Lahman in the form of an interview. On June 30th, Lahman gave his approval for the final draft, solidifying our collaborative effort.

Mazen Labban's multifaceted studies of urbanization, mining, and “wasting” under late capitalism explored the multiple intersections of various microbes with the circuits of capital. My introduction to Labban's work occurred during the course of my literature review when I encountered his contributions in Kate Crawford's book, "Atlas of AI", which played a key role in shaping the discourse around “planetary”. Crawford expanded on Labban's planetary mine to investigate the planetary infrastructure of AI as an extractive industry: from its material genesis to the political economy of its operations to the discourses that support its aura of immateriality and inevitability (Crawford, 2021). I first contacted Labban, who is currently based in New Jersey, at the end of May, and we both agreed on an informal interview through Zoom. Our dialogue revolved around several key themes, notably the materiality of AI, stratification, capitalism, and the pressing ecological crisis, which derived from Labban's publications; *Rhythms of wasting/Unbuilding the built environment* (Labban, 2019), *Deterritorializing Extraction: Bioaccumulation and the Planetary Mine* (Labban, 2014), in addition to his essays and articles as a senior editor at *Capitalism Nature Socialism*. The objective was to examine the discourse within the field of media archaeology concerning the Anthropocene and electronic waste, with a particular emphasis on dissecting the material foundations of AI's infrastructure.

Labban's deep-rooted interest in philosophy, especially the philosophies of Deleuze and Guattari, profoundly informed his conceptualization of the planetary mine in terms of materiality, the process of *becoming*, and the intricate interplay between living organisms and non-living matter. Additionally, Labban and I shared a common background as we are both Lebanese residing abroad for research purposes, which facilitated seamless communication and understanding. Despite the complexity of his work, Labban graciously dedicated his time to provide invaluable feedback on my research and the interview itself through email correspondence highlighting gaps in my thinking and enriching my bibliography with essential references. The final draft of the interview, now incorporated into this dissertation with Labban's approval, was received on September 28, 2023.

Pietro Bianchi's unique combination of Lacanian psychoanalysis, Marxist theory, and cinema gave insights into the societal and individual psyche shaped by technology and data. I was introduced to Bianchi's works in November 2022 via his essays on e-flux on psychoanalysis, film

and memory, which resonated with my approach of using artistic mediums as interpretive lenses for understanding complex concepts. Bianchi, who is currently based in Florida, engaged in a Zoom call where we explored the fluid nature of memory viewing it both as an elusive entity and a binding restrictive force. Throughout the conversation, Pietro analyzed film as a medium and engaged with psychoanalysis as a comprehensive framework to explain memory, subjectivity, and cultural work. Bianchi's insights on data mediation and disintermediation proved to be particularly invaluable in advancing my research. I also chose to materialize our exchange in the form of an interview, which Bianchi reviewed and approved on August 22nd.

Luis Sarmiento's hands-on experience in Silicon Valley and Machine Learning places him in a unique position that combines AI research with its real-world applications within industry-leading tech companies like Google and Amazon, offering a rare blend of theoretical and practical insider knowledge. On the 12th of July, I conducted a face-to-face interview with Sarmiento, during which we initially sifted through a predetermined set of questions. However, our conversation organically evolved, tapping into Sarmiento's vast reservoir of experiences and insights. Through this conversation, Sarmiento's technical proficiency significantly expanded my understanding, prompting me to reconsider the subtleties governing recommender and predictive algorithmic models, as well as the incorporation of affect within AI. Furthermore, Sarmiento shared his own perspective on the prevailing ideologies driving the tech industry, along with the potential dangers that could arise from such beliefs. His critical insights added depth to our discussion and illuminated the complex landscape of AI and its societal implications. The final draft of the interview was approved on the 5th of August.

Transcriptions were done using a subscription-based, data-protected, AI-powered, transcription tool called [Otter.ai](#). With a variety of insights collected, the concluding phase involved thematic analysis. The patterns and parallels that emerged from these discussions were then examined, creating a confluence between the perspectives of the interviewed scholars together, and then with the literature review, offering a profound understanding of a larger confluence of technology, time, and societal perspectives. As I will explore in my findings, the scholars help me move the discourse beyond the traditionally overemphasized individual subject and encourage a broader discussion. Central to my methodology is the synthesis of these varied perspectives.

All scholars had the chance to review and refine their comments post-interview for as long as needed, ensuring clarity and accuracy, especially given the interview's informal nature. While the scholars weren't directly involved in the final report drafting, their recommendations greatly influenced the bibliography and literature referenced throughout the research.

### *1.2.3 Ethical Considerations*

In conducting this qualitative research, my primary role and challenge as an investigator was to both deduce findings from interviews and weave them into a coherent yet adaptable narrative that is also informed by the literature review. This approach was guided by a commitment to upholding the core principles of qualitative research.

To ensure these principles are met, my interpretations were rooted in a careful examination of the interviews conducted with scholars and a thorough exploration of the existing literature. Additionally, I made explicit efforts to bracket my preconceived notions during transcribing the interviews, particularly when translating the scholars' own biased views on the subjects discussed in written format. Moreover, it is crucial to note that my interpretations of the interviews were integral to this research. Although the interviews reflect the scholars' works and reflections, the ultimate interpretations, particularly the confluence among scholars, were molded by my own worldview, and were meticulously analyzed in the context of the literature reviewed in this research. Further, informed consent was diligently obtained from all scholars before their interviews and again after. Participants were informed about the research objectives, its outputs, the portals of dissemination, the interview process, and their rights, including the option to withdraw from the study at any point without consequences. Their consent was voluntary, informed, and documented.

Finally, this research, significantly anchored in historical and mythological narratives, does not seek to trace a direct influence from ancient myths to contemporary technological developments, rather acknowledges some resonances with modern science where they emerge. Readers should anticipate not a linear pathway through these chapters, but rather a multilayered and intertwined narrative arc that references back to familiar figures and tales such as Prometheus.

### *1.2.4 Summary*

In summary, this research adopts a qualitative methodology that encompasses observation and semi-structured interviews grounded in the complexities of technology, ecology, memory, and time. I engage in a multidisciplinary exploration, drawing from literature, philosophy, psychoanalysis, and cultural studies to shed light on the multifaceted questions posed by our research.

Moreover, throughout this research, I aimed to navigate a broader historical landscape, recognizing the multiplicity of experiences and memories intersecting with our global technological timeline. I conducted dialogues with scholars from diverse fields, and despite their diverse backgrounds and fields of expertise, a confluence of thought unfolded. This might mean that the challenges faced with technology, subjectivity, and memory are not confined to specific

disciplines, and identifying these commonalities would provide further insight to a growing field of inquiry. It also suggests that relying on a singular perspective or discipline is inherently limiting, as is a linear approach from one point in history.

The qualitative methodology was chosen to address the dynamic and evolving nature of technology and the intangible nature of memory and the unconscious. Open-ended interviews allowed scholars from diverse backgrounds to contribute spontaneous and rich insights, enhancing the depth of our discourse. The guiding question of the research then becomes: 'What insights would a confluence of experiences and literature offer on the growing discourse of technology & memory in the Anthropocene?'

### *1.3 Research Structure*

To better understand the presented research, readers are invited to acquaint themselves with the structural anatomy of this dissertation, which is organized into five distinct sections. Each segment substantiates an important facet of the research, inherently merging methodology, thematic landscapes, literature review, and scholarly contributions.

Firstly, the introductory chapter seeks to provide not only a comprehensive roadmap of the overarching objectives and research questions but also an overview of the qualitative methodology employed. Readers can examine an extensive overview of the thematic landscape, thereby comprehending the rationale behind methodological choices, and the approach adopted for conducting interviews with scholars. It's imperative to emphasize the intrinsic value embedded within the interviews with scholars presented in subsequent sections. Engaging with these dialogues is not merely an option but a necessity, providing readers with a richer, interconnected comprehension of the manifold insights, narratives, and thematic confluence that emerge. Thus, it is my earnest appeal that the interviews be read and explored as integral threads within the themes of this research.

In the second chapter, I seek to examine the myth of Prometheus, and the philosophies that burgeoned in its aftermath, engaging in a comprehensive exploration of the philosophical nuances of technology. A focus is also placed on the conceptualization of '*anthropos*', perceived through Prometheus as both a primordial and divine archetype of humanity. Additional insights into '*anthropos*' relationship with *Being*, and with technology will be sought through an analysis of Martin Heidegger's lectures and works, which I hope would provide further insight into the human-technological condition. Lastly, I will provide a more thorough examination of the geological epoch of the Anthropocene and its relationship to human-technology entanglement through modern philosophers Bernard Stiegler, Peter Sloterdijk who were deeply informed by Martin Heidegger's works.

The third chapter examines the technical domain and further explores how the philosophical contemplations and anxieties of humankind's uncanny and fluid origin have become embedded within the colossal structures of data and technology that characterize the modern digital milieu. It also seeks to understand the transition of *anthropos* into this digital environment, subsuming a plurality of ethnic technical milieus into a global one. It begins with a historical examination behind computational languages and mathematical thought, then moves to a technical exposition of the digital milieu, demystifying AI and Big Data by leveraging insights from scholars like Kate Crawford among other esteemed researchers. Finally, a close examination of social memory and its syntheses in the digital milieu will be investigated through Yuk Hui's expansive works on the philosophy of technology and social memory.

The fourth chapter provides the different perspectives obtained through the in-depth dialogues with the scholars. Engaging with experts from a spectrum of disciplines - human-environment geographer Mazen Labban, AI researcher Luis Sarmiento, Lacanian psychoanalyst Pietro Bianchi, and cultural historian of technology, Jason Lahman - the dialogues aim to explore the complex entanglement of technology and the Anthropocene through a comprehensive, multi-referential lens. It is noteworthy to mention that, due to the voluminous depth of these dialogues and the page limitations of this dissertation, the full transcripts of the interviews are made available within the appendix of this dissertation whereas key insights and my reflection on them were provided in the text. Though stemming from varied expertise and academic backgrounds, I will explore how these scholars show notable confluence. Through this confluence, we can see that the very understanding of "human" and "intelligence" is under siege in our rapidly evolving digital milieu.

In the concluding chapter, I draw the strands from the dialogues with scholars and the literature established in the dissertation's literature review together, culminating with an understanding of this work's title, *Nostalgia Algorithm*. Readers will find a comprehensive analysis of the confluence mentioned among scholars' perspectives while drawing from existing academic discourses. This chapter also reflects on the broader implications of our findings for understanding technology and social memory and offers recommendations for further research and exploration in the field, acknowledging the limitations of this study.

## Chapter 2: Anthropos, Anthropocene, & the Promethean Melancholia

In this chapter, I will begin with an in-depth examination of the Prometheus myth, beginning with its earliest known renditions and subsequently addressing its sustained reverberations in contemporary narratives. Although the myth of Prometheus lacks a canonical narrative, one foundational narrative of the myth will be outlined through Plato's account, highlighting critical elements such as rebellion, foresight, and altruism that were crucial speculations on the entanglement between humans and their *technics* (Mayor, 2020, 62). This exploration extends to the Renaissance Humanists' reinterpretation of Prometheus through philosophers like Giovanni Boccaccio and Marcilio Ficino, transforming the titan from a myth to an archetype of *anthropos*<sup>1</sup>, the humanist subject and its superiority, profoundly influencing Western thought. In the Enlightenment era, Europeans envisioned *anthropos* as a legacy from classical Greece, and was perceived as a being positioned between the divine and the bestial, actively shaping its identity within the polis (Kirksey & Helmreich, 2010, 548).

Prometheus, in its various incarnations—human, divine, monstrous, and artificial, thus emerges as both an archival conduit to understand the history of the modern self, and a figure of fissure, symbolic of *anthropos*'s own finitude and divinity. The Promethean myth's own ambiguous narrative has made it a suitable medium for philosophical speculations on the enigmatic origin and condition of humankind (Franssen, 2014).

Further, drawing from Martin Heidegger's insights and Sigmund Freud's notion of the *uncanny*, I bring out *anthropos* as a *way of being*, shaped by the human-technological condition and an underlying sense of existential *homelessness*. This examination illuminates *anthropos*' transformation into a geological force within the Anthropocene, its relentless drive to mold and dominate its environment, and its attempt to homogenize humanity into a singularity. I engage with the thoughts of Bernard Stiegler, Peter Sloterdijk, and Walter Benjamin, particularly focusing on Benjamin's fragments on capitalism, to present one possible analysis of the entanglement between *anthropos* and *the unattainable*. This analysis sheds light on the broader implications for humanity's understanding of history, memory, and the human condition.

Concluding this chapter, I turn our attention to Pieter Vermeulin's notion of "*creatureliness*" and the role of memory in the Anthropocene. This era challenges entrenched views of the humanist subject, its centrality, and its linear historical narratives, prompting a reassessment of humanity's relationship with the non-human world and the broader ecological systems it inhabits. This

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<sup>1</sup> Referring to *anthropos* as an archetype of "man" rather than "*humanity as a whole*" in the text referring to the "*humanist subject*" was left unchanged to reflect the historical and theological perspectives on gender roles and sexuality of the time. This Judeo-Christian tradition has often viewed man as superior to women, a concept rooted in interpretations of early Genesis narratives, and that still persist to this day (Kvam et al., 1999, 15-40).

reimagining of the human subject – beyond the confines of anthropocentrism – opens up new possibilities of resistance and new understandings of human existence beyond the human. This introductory exploration, then, doesn't only examine the age-old story of Prometheus but also examines humankind's melancholic pursuit that eventually severs humanity from life itself.

### *2.1 Prometheus: Between Myth, Imaginaries, and Conjectures*

At the heart of human history lies the activity of myth-making, drawn from the Greek word *mythologia* (Kerényi, 1997). More than mere stories, myths allowed humankind to navigate complex truths and ideas, bridging temporal, cultural, and intellectual gaps. Among many ancient cultures, the Greeks were enveloped in their own philosophical contemplations about what it truly meant to be human. For the ancient Greeks, these questions were not mere musings but a crucial exploration that deeply infused their mythological narratives, particularly reflected in the stories of Prometheus, Jason and the Argonauts, Medea, Daedalus, Hephaestus, Talos, and Pandora. Such a complex network of myths, as highlighted by Adrienne Mayor in "Gods and Robots" (2020), were inherently speculative explorations into "*biotechne*" – a blend of *bios* (life) and *techne* (craft), and further thoughts on the boundaries – and potential conflation – of biological and artificial beings. Thus, when interpreted through this lens, these ancient myths reveal a philosophical and metaphysical probing that have invariably acted as a metaphorical conduit to bridge between the divine and mortal, or the biological and the manufactured (Mayor, 2020).

How indeed does humanity possibly navigate the precipice between its mortal limitations and a longing for the divine? The melancholia nested within this quest deepens with each evasion of an answer, creating a world always *becoming* yet never fully realized (Freud & Strachey, 1957, 243-258). It is perhaps most intriguingly embodied within the Greek myth of Prometheus, which surfaced and resurfaced in numerous Greek and Latin sources to explore the origin of humankind and to answer existential questions (Mayor, 2020). The enduring presence of the titan Prometheus casts him into a lingering spectre in our modern technological ethos, and an archetypal figure of the human condition as I will explore in the subsequent passages. This myth, replete with themes of fire, rebellion, and creation, stands out not for its singular message, but rather its ambivalence and malleability (Franssen, 2014, 161). Its storylines, spanning from Hesiod to Plato, depict Prometheus in diverse lights: from a trickster bringing misery to an archetype of *anthropos*<sup>2</sup>. This ambivalence is central to its endurance, especially given that

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<sup>2</sup> Anthropos" (ἄνθρωπος), a Greek term, translates to 'human' or as 'the creature who looks upwards and considers what he has seen (Plato, 1921, 399c).' Historically, Anthropos in religious and philosophical contexts often characterized aspects of Christ in the New Testament and was pivotal in Gnostic thought, and is considered the first human being. This term also appears in the original Greek New Testament as part of the phrase translated as "Son of man." (Kraeling, 2008, 13)

there's no canonical version, allowing it to adapt with evolving societies. The ancient Titan has consistently captivated the minds of artists and poets, from Goethe to Romantics like Byron, Shelley, and even Nietzsche, (Raggio, 1958, 44). In the following passages, I will explore some renditions of Prometheus through history, emphasizing on its philosophical incarnations with the Renaissance Humanists onwards. I hope to show how its essence lies not just in its thematic plurality but in its very ambiguity, which makes Prometheus a suitable conduit to explore the fluidity of what it means to be human.

In the earliest rendition of the tale, narrated by authors like Plato and through the works of Hesiod and Aeschylus (Aeschylus & Kerr, 2005), Prometheus emerges as both a benefactor to and creator of humankind, navigating through a difficult relationship with the gods, namely Zeus. In a recount by Plato in "Protagoras," the creation of humans and animals was consigned to two Titans: Prometheus ("Forethought") and his younger brother Epimetheus ("Afterthought"). Here, Epimetheus, absorbed in allocating qualities of speed, strength, camouflage, and more to non-human entities, inadvertently ran out of qualities and survival capabilities to give humans, leaving them naked and defenseless. Prometheus, in a desperate pursuit to ensure human survival, stole powers of technical skills, speech, and fire from the gods to endow the fragile mortals, enabling them to forge tools and devise means to surmount their inherent frailties (Mayor, 2020, 61). Prometheus' benevolence towards humanity did not only revolve around fire-stealing but expanded across various myths to also embed him as the creator of the human race, symbolizing humanity's intrinsic link and dependency on technology and enhancements (Rogers & Stevens, 2015, 1-3).

Zeus, infuriated by Prometheus's theft and the conferral of such forbidden powers onto humanity, devised a punishment of cyclic, eternal suffering for the Titan. He was to be bound to a mountain, his liver pecked out daily by Zeus's eagle, only for it to regenerate overnight to endure the agony anew the next day (Mayor, 2020, 51). Yet, the symbolism of Prometheus does not end with punishment; it emerges into a broader, timeless allegory of the seeking soul and humanity's incessant pursuit of enlightenment and technological prowess, transcending beyond a mere myth into a symbol of resistance against tyranny, creative genius, and humanism (Grafton et al., 2013, 785). It can be interpreted as an early example of speculative fiction, reflecting a culture's contemplation of technology and its relation to and impact on human existence (Mayor, 2020, 62).

In the early Christian centuries, particularly around the 3rd and 4th centuries, the Promethean myth found its way into Christian iconography, merging with the Biblical narrative of Genesis (Raggio, 1958, 48). The Promethean myth's influence on depicting the creation of Adam can be

seen on numerous artifacts, including a glass cup found in a Roman tomb in Cologne (Fremersdorf, 1951, no.4, Taf. 4-5). The most detailed interpretations are evident on pagan sarcophagi (Raggio, 1958, 48). One notable example can be observed on a coarse carving from *Campli* portraying the Lord sitting on a throne, sculpting the body of Adam in a manner reminiscent of how Prometheus is traditionally shown crafting humankind (Wilpert, 1932).

Around the Middle Ages, Prometheus moved towards a more philosophical and humanistic context, diverging from the religious symbolism prevalent in earlier artforms. A notable example can be found in Giovanni Boccaccio's "Genealogiae 1472," where the Promethean myth is used to symbolize the intellectual evolution of humankind (Raggio, 1958, 53). Boccaccio differentiates between two Prometheuses: the divine embodiment representing God, and a historical figure, an Assyrian king who imparts stellar knowledge to his subjects after solitary meditation in the Caucasus. However, this king, representing the learned *man* or "*homo doctus*," endeavors to uplift the primitive "*homo naturalis*" to the civilized "*homo civilis*" using divine wisdom obtained from contemplative isolation (Raggio, 1958, 54). Boccaccio's depiction, rooted in medieval sources, subtly influenced the perspective of Renaissance humanists like Marsilio Ficino whose humanist Prometheus would indelibly mark European intellectual currents in the ensuing centuries.

In the following sections where "*man*" is used to represent human beings, it's important to note the historical and theological context influencing this terminology. Medieval theology typically placed a higher value on celibacy than on marriage, and this often led to a dichotomous view of gender roles, with woman's procreative ability being unfavorably compared to man's presumed spiritual superiority (Kvam et al., 1999, 249-304). Thus, in the context of this work, when referring to *anthropos* as an archetype of *man*, it's essential to understand that the use of "*man*" is also reflective of these historical gender perceptions, where *man* was often viewed as superior to woman. This understanding becomes crucial for interpreting the gender bias inherent within the "*humanist subject*".

During the early Renaissance period, humanist philosopher Marsilio Ficino (1433-1499) engaged with virtually every prominent academic mind of his period to translate the entirety of Plato's extant works into Latin while merging them with Christian theology<sup>3</sup> (Franssen, 2014, 67). Through his translations and interpretations of the philosophical Hermetica, and the synthesis of Platonic and Christian doctrines, Ficino conceptualized a *Promethean* philosophy of *man*. The

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<sup>3</sup> Patristic theology aimed to blend pagan and Christian ideas to spread the faith, a tradition furthered by Marsilio Ficino's translations of Plato. Unlike earlier scholars who kept Platonic concepts separate, Ficino sought to fully integrate Platonic and Christian doctrines, marking a significant shift in combining these historically distinct philosophies (Franssen, 2014, 67)

Promethean analogy in Ficino's "*Theologia Platonica 1482*" and his translation of *Poimandres 1463*, represents an anthropocentric meditation on the inherent divinity and duality of *man* — a melancholic<sup>4</sup> *anthropos* torn between the temporal and eternal realms, life and death (Ockenström, 2013, 44).

To Ficino, Prometheus, who steals divine fire or "reason," encapsulates humanity's creativity and dominance over nature, emphasizing *man's* genius in art, governance, and the ability to transcend the confines of nature (Allen et al., 2002, 51). Drawing from *Neoplatonism*<sup>5</sup>, Ficino also recognized the absurdity in *man's* nature, seeing the human soul as akin to Prometheus, an immaterial entity that could transcend its bounds, yet remain tethered by its yearning for higher truth (Allen et al., 2002, 48, 49, 50). It's in this duality that Ficino's philosophy finds its most profound melancholy. The *anthropos*, although endowed with celestial intellect, falls from grace and becomes an incomplete artisan obsessed with recreating or repossessing the states it has lost (Wilson, 2006, 44). Ficino contemplated the Hermetic tradition to find spiritual and emotional equilibrium and cure this melancholia (Wilson, 2006, 10). He believed that the soul, being eternally linked to the divine, possessed innate intellectual ideas that offered pathways for individuals to decipher eternal truths (Mensch, 2019, 185).

Although Hermetic traditions waned in the seventeenth century, Marsilio Ficino's emphasis on *man's* divine qualities and central role in the universe set the stage for a revival of anthropocentric Neoplatonism (Ockenström, 2013). This revival played a significant role in shaping the Renaissance Humanism and the Enlightenment era that followed, emphasizing individual sovereignty and marking a pivotal shift towards a utilitarian perspective on the natural environment (Ockenström, 2013, 39). Central to this perspective was the individual, positioned as the primary agent of progress in Western thought. By the mid-seventeenth century, while mechanical explanations gained prominence in understanding natural phenomena, figures like Rene Descartes and later G. W. Leibniz<sup>6</sup> still echoed Ficino's neoplatonist assertions of certain

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<sup>4</sup> Drawing upon the Edenic narrative of Adam and Eve, this melancholia is ensuant of the disobedient pursuit of forbidden knowledge, facilitated by the tempting serpent, which cast humanity into a realm of mortality and struggle, stripping them of their divine, immortal grace (Kvam et al., 1999, 15-40).

<sup>5</sup> Neoplatonism, a dominant philosophical ideology from mid-3rd to mid-7th century, emerged in the Greco-Roman era, post-dating materialist philosophies like Epicureanism and Stoicism. It posited that mindful consciousness (nous) is ontologically superior to the physical realm (Mind over Matter). It also held that all cognitive and physical realities depend on a singular, supreme principle (Wildberg, n.d.,)

<sup>6</sup> Despite the limited recognition of Leibniz's exposure to Ficino's work, there are parallels between Ficino's natural philosophy and Leibniz's vitalistic monadology, illuminating their shared advocacy for a divine origin of nature's orderliness. While Leibniz assimilates elements from Ficino's ideology into his doctrine, a marked distinction arises in their focal points, with Leibniz emphasizing practical undertakings and Ficino leaning towards contemplation (SNYDER & WILSON, 2017).

innate truths notably in the realm of ideas, emphasizing direct sensory perception and rational thought as the primary means of understanding the world. (Mensch, 2019, 187-188).

Furthermore, the Romantic era witnessed transformative shifts with the century's advancements in electromagnetism, 'galvanism', and thermodynamics which sparked both scientific and public fascination (Lahman, 2023).

*“During the same period, experiments investigating electricity's effects on the human body were gaining momentum. Scientists like Luigi Galvani found that electricity could induce muscular movements in a dissected frog, suggesting the presence of a previously unknown life-force”*

- Jason Lahman.

Mary Shelley's "*Frankenstein 1818*," often referred to as "*The Modern Prometheus*," showcases the myth's adaptability within the context of her era's scientific and cultural shifts, notably the exploration of electricity (Mayor, 2020, 125). Shelley's surrounding intellectual milieu, including her father William Godwin's writings on artificial life and the Romantic poets Percy Shelley and Lord Byron's focus on Prometheus, also heavily influenced her (Mayor, 2020, 125). By naming her work "*The Modern Prometheus*," Shelley linked the ancient myth with the moral, ethical, and existential dilemmas brought forth by the rapid advancements of her age. In her seminal science-fiction narrative, Victor Frankenstein aspires to craft an organic being from previously living parts and animated through electrical galvanism, only to create a monstrous being, plagued by existential resentment. As Mayor also notes, Immanuel Kant's critiques of Benjamin Franklin's electrical discoveries and the dangers of “unbridled curiosity” deeply resonated in the tragedy of Victor Frankenstein (Mayor, 2020, 126).

*“The blend of harnessing mysterious forces, replicating life, and the ascent of modern technology are all embodied in Mary Shelley's Prometheus, making it an enduring symbol and an ominous precursor to the challenges and ethical dilemmas we continue to face in our technological pursuit”*

- Jason Lahman

The legacy of the Romantic era continues to deepen the melancholia embedded in the ambiguous nature of *man*, while contemporary humans grapple with the great confusion towards their identity, autonomy, and freedom (Wilson, 2006, 6). In his reinterpretation of the Promethean myth, German philosopher Friedrich Nietzsche (1844 - 1900) emphasizes this confusion, and sees Prometheus as emblematic of humanity's tendency for self-deception. Nietzsche perceives humans as incomplete or as creatures "not yet defined"— beings whose potential is often

curtailed by self-imposed artificial truths and illusory beliefs (Franssen, 2014, 117-122). Similarly, in his *"The Acquisition and Control of Fire"* (1932), Austrian neurologist and psychoanalyst Sigmund Freud (1856-1939) also interprets the Prometheus myth as emblematic of the individual's internal struggle between desires and their restraint (Freud & Strachey, 1964, 191). Freud also sees Prometheus as representing rebellion against both parental and religious authority, suggesting that, in their inherent imperfection and vulnerability, humans search for a divine, paternal figure to compensate for their perceived inadequacies (Franssen, 2014, 127).

From a more contemporary lens, Jewish philosopher Günther Anders<sup>7</sup> (1902-1992) echoes Nietzsche and offers a somber view of the modern Promethean human in light of the invention of the atomic bomb. For Anders, humans inherently lack a fixed nature, positioning them as beings without a clear origin or anchor (Anders, 1956, 146). This inherent "unworldliness" gives humans the freedom to endlessly shape and reshape their realities. Yet, this same fluidity, once celebrated as a testament to human potential, now confronts humanity with a "Promethean Discrepancy" where humans who have created realities of immense complexity and power, struggle to fully grasp the scale of what they've brought into being (Anders, 1962, 496). This profound dissonance transforms humans into what Anders calls "Inverted Utopians", instilling a melancholic recognition of their limitations in the face of their own expansive creations (Anders, 1962, 496). Nietzsche's interpretation of the Promethean myth, although centered on human self-delusion and constructed religious constructs, shares with Anders the idea of humanity's struggle in a world of their own making (Franssen, 2014). Together, both thinkers paint the *Promethean man* as an ever-evolving, yet fundamentally unanchored being, navigating the complexities of self-realization amidst a world it helped create.

Throughout history, various interpretations of Prometheus have consistently emphasized a deep, morally charged connection between the titan and the human condition. So far, I've explored the changes of the Prometheus myth in Western philosophy, from its biblical portrayals to its reimaginings through the Renaissance humanists. This enduring myth, with its flexible and non-canonical narrative, has served as an ideal medium for examining the malleable and evolving nature of *anthropos*, the archetype of human existence and its origins (Franssen, 2014, 161). The concept of "*anthropos*" proves to be elusive and continuously transforming. Perhaps it's in the blend of human, monstrous, divine, and the artificial shaping of one's environment, that we find the most real reflection. Mary Shelley's "Frankenstein" is a salient example where these

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<sup>7</sup> Günther Anders, born Günther Stern (1902-1992), was a Jewish philosopher from Breslau and Walter Benjamin's cousin. Although not part of the Frankfurt School, he influenced their work. Studying under Martin Heidegger in the 1920s, Anders critiqued Heidegger's Dasein for its "pseudo-concreteness" yet acknowledged his handling of existential themes like temporality and being-in-the-world. (Dawsey, 2017)

combinations seem to converge – it represents a tipping point where mythology and technological reality bleed into each other, shaping our understanding of the Promethean attitude. Such an undefined, ambiguous understanding of humanity echoes Günther Anders' assertion that there exists no singular origin for humans; rather, *anthropos is the ever-changing creation of its own world* (Franssen, 2014, 234).

In the following section of this chapter, I introduce "*anthropos*" as a "*way of being*" in the modern era, defining the relationship with technology while confronting the brittle notion of "self". Using Martin Heidegger's lens, paralleled with insights from Sigmund Freud, I will explore the term *Unheimliche*, primarily understood as "uncanny," to describe this way of being as the essence of "*anthropos*." I will touch upon Heidegger's insights on the human-technological condition, emphasizing how modern '*techne*' reflects the human's ceaseless endeavors to sculpt its environment. This Heideggerian viewpoint is crucial in understanding the longstanding tension between *techne* and Being evident in various epistemological domains throughout history through myths like Prometheus, to today's contemporary technological and existential discourses. Building on Heidegger's philosophy, we'll draw analogies with Walter Benjamin's Concept of Critique and his fragments on Capitalism, and engage with the thoughts of contemporaries such as Bernard Stiegler, Peter Sloterdijk, among others. Together, we will examine the global dominance of Western technology, observing how the mechanistic view of nature as an uncanny separate entity has given rise to extractive technologies, such as Artificial Intelligence. This sets the scene for understanding the Anthropocene not merely as a looming ecological catastrophe, but as a sphere of contrivances.

## 2.2 *Anthropos the Homeless Dweller*

*"There is much that is strange, but nothing that surpasses man in strangeness."*

- Martin Heidegger

Martin Heidegger, became a prominent figure in Western contemporary thought and philosophy, despite the controversies<sup>8</sup> surrounding him (Wheeler, 2020). In an interview with *Der Spiegel* in 1966, Heidegger expressed concern that the very efficiency of modern technology, which makes "everything function," is what is leading to an existential uprooting of humanity (Heidegger, 1976). His insights into the essence of technology and his revisited notion of '*Unheimliche*' are particularly relevant to the current discourse on the relational dynamics between contemporary

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<sup>8</sup> Despite his significant influence as a philosopher, Martin Heidegger was involved with Nazism, and further studies suggest he identified with Nazi ideology most of his philosophical and academic career despite refutation. (Paskow, 1991)

technology and human life explored in this research. In the following passages, I will introduce Heidegger's philosophy of homelessness, and some of his major relevant concepts such as 'Unheimliche', 'Dasein', and 'Ge-stell', which Heidegger explored in "*Being and Time*" and other lectures. Through Heidegger, I hope to reflect on the melancholia we explored previously: the relentless Promethean pursuit to overcome inherent limitations in hopes to reconcile with the divine *anthropos*.

What is *anthropos*? To provide a possible analysis of *this figure of the human*, Martin Heidegger (1889, 1976) turns to Sigmund Freud's seminal works "*Das Unheimliche*"<sup>9</sup>. Freud describes *Das Unheimliche* or The Uncanny as a complex emotional landscape where the familiar unexpectedly surfaces, eliciting a primal terror not from the new, but from the resurfacing of what is intimately known yet was meant to remain concealed (Freud, 1919). It is this concept of the uncanny, with its interplay of concealment and unconcealment, that Heidegger found particularly resonant with an existential angst that describes the human's sense of self and place in the world (Krell, 1992, 49). However, Heidegger's exploration of "*uncanniness*" (*Unheimlichkeit*) ventures deeper than the initial impression of unfamiliarity expressed by Freud.

In his lectures on Friedrich Hölderlin's late hymn, Heidegger further describes '*anthropos*' as a state of '*uncanniness*' (*Unheimlichkeit*) or '*homelessness*', despite the fact that humans have mastered their environment and acquired language and thought (Warminski, 1990, 196). Heidegger's interpretation of the Greek words '*deinon*' and '*deinotaton*' as '*unheimlich*' (often translated as '*uncanny*') reflects his understanding of the human condition of living and dying: a profound strangeness in the human's cycle of reaching out into the unfamiliar and returning back to the familiar, confronting and interacting with life and death (Warminski, 1990, 196).

Heidegger also posits that the essence of humans is that they are inherently not at home in the existential sense, challenging the conventional notion of belonging and roots (Warminski, 1990, 200). '*Being-in-the-world*' or *Dasein* (existence or "being-there") is a Heideggerian term that describes the way humans are embedded in the world they call home. The irony for Heidegger is that while the human is intrinsically familiar with their world and cannot be separated from it, they still experience a sense of *Unzuhause* or "*not-at-home*" — an existential rootlessness from this world they call home (Krell, 1992, 45). This inherent "*not-at-home*" sentiment originates from the human's deepest relationship with their own being and the anxieties towards their own mortality and finitude.

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<sup>9</sup> Ernst Jentsch was the first to introduce the idea of the uncanny. According to German philosopher F. W. J. Schelling, whose definition of "uncanny" Freud adopts and further develops in his 1919 essay "*Das Unheimliche*", the uncanny is precisely what ought to have stayed secret and secluded but has instead emerged into visibility (Krell, 1992, 49).

Heidegger describes the human body as "the most difficult problem," a site of this profound uncanniness, highlighting its inherent anonymity and genderless origin (Krell, 1992, 56). It becomes clear how Heidegger's concept of '*Unheimlichkeit*' or *uncanniness* plays a significant role in his analysis of human existence. '*Unzu Hause*' or the feeling of *not-being-at-home* becomes an inescapable expression of the human's being in the world; familiar yet unhomelike, highlighting a state of constant existential tension. While Heidegger's philosophy often interplays with Freud's themes of fear and anxiety, he believes that the core of the uncanny doesn't just lie in spaces of solitude and darkness, but rather in the "*nothing*" — the absence or void that underpins humans' existence itself and their being in the world (Krell, 1992, 51). Realizing one's own mortality and the very nature of being alive in stark nakedness, is exactly what leads to this deep anxiety, repressed in concealment (Krell, 1992, 51). 'Home' then becomes an elusive state for *anthropos*, as its only possible 'home' is in the state of being '*not-at-home*' (*Unzu Hause*), and its only possible nature is to *dwell*<sup>10</sup> as a world-open, existential being (Krell, 1992, 51).

From Heidegger's view, this also reflects the technological way of life and the essence of modern technology outside conventional anthropomorphic-instrumental<sup>11</sup> definition. To Heidegger, *techne* becomes a form of '*revealing*': a manner through which reality presents itself to the human, and through which the human engages with and comprehends the world around them (Heidegger, 1977, 12). If *techne* reveals the truth of being, then what does modern technology, in its essence, reveal or bring forth about being and nature? Heidegger takes a phenomenological approach using Greek mythology. In Greek thought, *techne* or craft, was not about creating anew but rather a *poiesis*<sup>12</sup>, or a form of thoughtful revealing an existence latent within the material - a silversmith brings forth a sacrificial chalice that was inherently present within the silver (Heidegger, 1977, 8). In contrast, Heidegger describes the essence of what modern technology reveals as '*Ge-stell*<sup>13</sup>' or '*Enframing*' which implies ordering the world and existence in a way that allows for ready availability and consumption, similar to how books are arranged on a shelf for easy access (Heidegger, 1977, 16-18). In this sense, modern technology does not poetically

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<sup>10</sup> Heidegger's use of the term dwelling encompasses not just a physical presence but an ontological state of being intertwined with the earth, the sky, the divinities, and other mortals (Heidegger, 1971).

<sup>11</sup> (A-I) definition of technology perceives technology as a means to an end and a human activity.

<sup>12</sup> Greek *poiésis* stems from *poiein* which means to make, produce. This is also where the Latin word "Poetry" comes from. (Cassin & Apter, 2014)

<sup>13</sup> In Heidegger's writings, the term '*Gestell*,' commonly translated as 'enframing,' plays a crucial role in articulating the significant shifts he observes in modernity. In everyday German, '*Gestell*' means 'frame' or 'rack.' However, in Heidegger's philosophical usage, it is a neologism, and he often writes it as '*Ge-stell*' to emphasize its derivation from various concepts related to the root verb '*stellen*,' which means 'to place or put.' This distinction highlights the term's nuanced meaning beyond its ordinary use. (Davis, 2009, 183 - 194)

bring forth but rather imposes a ‘*revealing*’ of the world as a ‘*standing reserve*<sup>14</sup>,’ a resource ready for exploitation, measurement, and utilization (Heidegger, 1977, 14).

An examination of *techne*’s transition from *poiesis* to *enframing* necessitates acknowledging a historical shift in thought which occurred with Cartesian philosophy, subjectivism, and the modern tradition derived from the works of French philosopher René Descartes (1596–1650). Heidegger critiques Cartesian subjectivity for positioning the human, or *anthropos*, as the ontological epicenter, steering the entire course of modern philosophical thought into the quagmire of subjectivism (Mansbach, 1998) where knowledge is limited to individual reasoning (Pippin, 1997, 375-394). Descartes, who was also a mathematician, devised a deductive and calculative mechanism in scientific and philosophical investigations which broke down problems into their most basic, measurable components *rendering man master and commander of nature* (Descartes, 1998, 35). This approach to scientific research laid the groundwork for the development of analytical processes in mathematics during the 17th century, inspiring figures like Blaise Pascal and Gottfried Wilhelm Leibniz to devise their mechanical calculators, pioneering the concept of automated computation, as Jason Lahman posits in our interview. Even more, Leibniz’s profound impact on the information age extended beyond his groundbreaking contributions to the modern binary number system, integral and differential calculus (Hall, 2002); he also pioneered a “*computational imaginary*,” exploring the transformative potential of making, not just nature, but the whole world computable (Leibniz, 1976).

The emergence of cybernetics in the 20th century, led by thinkers like Norbert Wiener, introduced a transformative perspective on understanding control, communication, and systemic structures. Systems, whether natural or mechanical, were seen through the lens of feedback mechanisms and regulatory processes (Wiener, 1961, 11). Essentially, cybernetics is a cross-disciplinary field merging engineering and computational mathematics, focusing on how dynamic systems respond to inputs and are influenced by feedback (Wiener, 1961). Wiener saw Leibniz as an early precursor to cybernetic thought, noting similarities between Leibniz’s *monadology*—a theory where individual entities (*monads*) mirror the entire cosmos—and the interconnected systems central to cybernetics (Wiener, 1961, 41). Here we can see the continuity of thought of some of the anthropocentric elements of Neoplatonism and the *humanist subject* previously mentioned in the works of Marcilio Ficino, through Leibniz to modern cybernetics theory. The essence of cybernetics resonates with Leibniz’s philosophy the *principle of sufficient*

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<sup>14</sup> Heidegger provides an example using a hydroelectric plant, in this case, the Rhine river is isolated from its natural context and converted into a source of power, embodying the transition of a natural entity into a resource (Heidegger, 1977, 16).

*reason*<sup>15</sup>, envisaging a world interconnected and modulated by feedback mechanisms, resonating with the Neoplatonic idea of an interlinked, purposeful divine universe (J. Mistho, 2018).

Towards the end of his career, Heidegger voiced deep concerns regarding the increasing technologization and scientification of human existence, and he interpreted these philosophies as signifying a shift in humanity's relational stance towards nature and knowledge (Heidegger, 1966, 7). Rather than adopting a contemplative or meditative approach to phenomena, they advocated a pragmatic use of knowledge to dominate and exploit the forces of nature (Heidegger, 1966). With humanity embedded in nature, this utilitarian perspective extends to humans—who are predominantly perceived as resources ripe for utilization and exploitation. Concepts like "human resources" for example reflect humanity's own self-view through the lens of the standing reserve. Moreover, Heidegger's reservations concerning cybernetics were also significant. In an interview with *Der Spiegel* in 1966, when asked about what has replaced philosophy in society, Heidegger's answer was clear: cybernetics (Heidegger, 1976). He posited that the very notion of the organic, emblematic of nature's complexity, was being overshadowed by a mechanical-technological zeitgeist (Lovink & Hui, 2019).

This interpretation was rooted in Heidegger's observation of modern information science transforming domains like language into mere data exchanges and arts into information instruments (Babich, 2007, 218). Heidegger's critique of cybernetics sheds light on some of the potential pitfalls of an unbridled embrace of technology and the scientification of all realms of existence, but most importantly, the anthropomorphic and anthropocentric tendencies embedded in modern technology. While cybernetics promises efficiency, unity, and comprehensive understanding, it also risks flattening the multi-dimensional richness of existence into mere data points in a system, representing the culmination of the metaphysical desire for a universal language encompassing all spheres of life and knowledge (Beistegui, 2005, 104). The unfolding narrative of technology, as Heidegger critiques it—particularly within the Western context—profoundly shaped societal and cultural understandings throughout the twentieth century. Heidegger not only acknowledged the global dominance of Western technology and the looming ecological catastrophe, but also the need to question the essence of technology is presumably dying out (Heidegger, 1964). The mechanistic worldview of the natural world has manifested in extraction technologies, which was then supplanted by a paradigm of globalism

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<sup>15</sup> In Leibniz's context, the principle of sufficient reason refers to an argument tracing from causes to effects. Specifically, an a priori proof for Leibniz encapsulates a causal sequence. Such a proof functions both as a demonstration—where premises lead inescapably to a conclusion—and as a causal explanation, detailing the antecedent causes behind a particular truth or event. (Adams, 1998, 109)

(Babich, 2007, 218), where nature becomes perceived as an array of self-regulating machines, signifying a complete technologization of our worldview.

Decades after Heidegger declared cybernetics as the new philosophy (Heidegger, 1976), the world has indeed transitioned into an era dominated by algorithmic technologies, media, and automation. Our present is characterized by the portrayal of social relations as networks, and conceptions of intelligence and cognition as processes of information. The once profound distinction between humans and machines blurs as aspirations grow to replicate human faculties in 'artificially intelligent' automata. As we navigate toward a globally homogeneous technological culture—the Anthropocene perhaps represents a pivotal juncture in Heidegger's concept of both 'enframing' and the *Unheimlich*, a place where *anthropos tirelessly looks for a place to belong, while its stark mortality and frailty are concealed inside an ever changing biosphere it yearns to call home*. In the following section, I will explore these themes further through Yuk Hui & Pieter Lemmens' own analysis of both philosophers Bernard Stiegler and Peter Sloterdijk, who, building upon the works of Heidegger, deliver a distinct diagnosis of *anthropos* and its *technics*.

### 2.3 Anthropocene: Anthropos and its Biosphere

In this passage, I will provide a more thorough examination of the Anthropocene—a geological epoch defined by human influence on Earth—through an examination of what such a definition discloses about *anthropos*. While various thinkers have explored the implications of this era, both philosophers Peter Sloterdijk and Bernard Stiegler offer compelling spatial and temporal interpretations on how humanity constructs its world and takes care of its existence, deeply informed by Martin Heidegger's critique of modern technology and the question of Being. These philosophers conceptualize the *anthropos'* intrinsic relationship with *technē*, offering anthropo-technical perspectives on what shapes human evolution. The Anthropocene, with the *anthropos* at its center, seems to reveal the deeper aspects of a *way of being*—a state of flux, the lack of a definitive origin, and a relentless search for a 'home'. I hope to add a layer of complexity to our understanding of the Anthropocene through the notion of the undefined essence of the human, as noted by thinkers like Günther Anders and Martin Heidegger, reframing the Anthropocene as more than an era of human impact on the planet, but also reflective of humanity's constant state of existential questioning and transformation.

The Anthropocene, a term popularized by Dutch atmospheric chemist Paul Crutzen in 2000, is an epoch where humans have become a significant geological force, reshaping Earth with activities like greenhouse gas emissions (Crutzen, 2006, 13,18). The onset of this epoch is debated; some believe it began with the Industrial Revolution, while others suggest it dates back to the advent

of agriculture or even to the post-Second World War "Great Acceleration." Philosophically, this epoch gains significance in this research because it attempts to define a geological era by the predominance of *anthropos* as the sole actor behind Earth's changes, burdening humanity with a responsibility towards its own survival and the survival of other dependent lifeforms (Lemmens & Hui, 2017, 26). Incorporating this perspective, the definition of an era based on the influence of an undifferentiated human is problematic. *This approach overlooks crucial biophysical processes like microbial metabolism*, as highlighted by human-environment geographer Mazen Labban in our interview. This view is also shared by thinkers like Bruno Latour who emphasize the Earth System's feedback effects on anthropogenic impacts (Latour, 2014). We will explore these implications further in the conclusion, as the nature of *anthropos* becomes clearer.

As we've explored thus far, Heidegger translates the human figure or *anthropos* as 'uncanny' and 'homeless,' (*Unzuhause*) or 'not-at-home' indicating humans' fundamental lack of origin (Krell, 1992, 44). Further, Heidegger also expressed profound concern about the essence of modern technology which enframes the human and conceals truths about their Being (Heidegger, 1977). However, For Heidegger, reconciling with technology not as a mere tool, but as a granted destiny in which humanity is inextricably embedded, offers possibilities for salvation (Heidegger, 1977, 31). In this context, *anthropos* emerges from the Anthropocene as a technologically empowered, almost monstrous entity, continuously evolving and dependent on its own technogenic creations. This perspective, shared by thinkers like Peter Sloterdijk and Bernard Stiegler, emphasizes *anthropos* as an unstable and historical category, always in the process of *becoming* (Lemmens & Hui, 2017, 28).

Peter Sloterdijk, influenced by Heidegger's notion of technology as destiny, extends this idea to an 'onto-anthropomonstrosology,' suggesting that *becoming human* is intrinsically tied to the creation of "spheres" – protective environments and insulation spaces forged through *technics* (Sloterdijk, 2017, 108). These spheres are seen as anthropogenic engines or incubators essential for self-domestication. For Sloterdijk, the Anthropocene is an era that amplifies humanity's inherent trait of creating and inhabiting these spheres, now on a planetary scale (Lemmens & Hui, 2017, 28).

Furthermore, Sloterdijk's idea of the *anthropos* as monstrous or uncanny resonates with the idea of humans as beings without a fixed essence or origin (Lemmens & Hui, 2017, 28). This homelessness or lack of grounding is not something to be lamented but is intrinsic to human existence. It's this very lack that propels humans to create, to build, and to forge their existence in relation to *technics*.

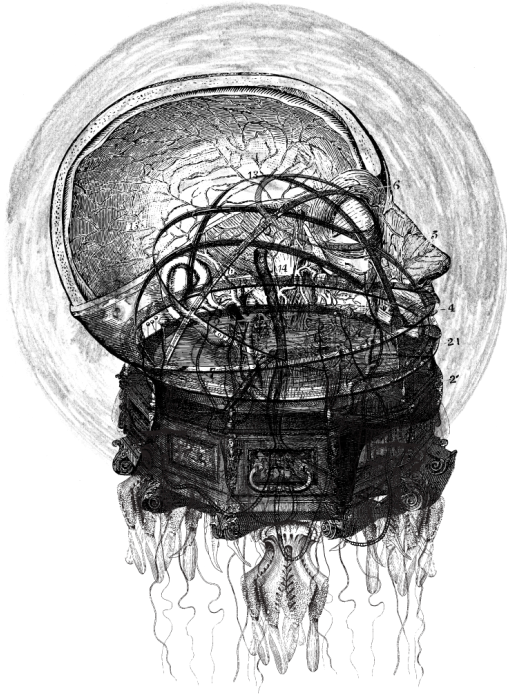


Figure 1. "Incubators", Collage work using vintage illustrations © Maya Hershey, Tom Chalky

Bernard Stiegler also sees humans as beings without origin or essence who are fundamentally reliant on technological tools and systems as 'compensations' that define and shape their existence (Lemmens & Hui, 2017, 28). However, Stiegler understands *technics* as the true foundation of humanity's temporal existence, seeing the *uncanny* or (*Unheimlich*) more as a post-event realization (*Nachträglichkeit*) than an ontological "homelessness", as posited by Heidegger (Stiegler, 1998, 219). Stiegler explains that technical objects form a social memory or 'epiphylogenetic' memory, an external memory constituting humanity's historical-cultural being (Stiegler, 1998, 140). This technological memory, different from genetic or individual memory, is manifested in language, tool use, consumption, and rituals, reflecting an exteriorization of memory (Stiegler, 1998, 177). In this framework, Stiegler develops a general organology<sup>16</sup>, viewing *technics* as both the liberation and perfection of organs, intertwined with the concept of time, and forming this circuit of retentions he calls the tertiary retention, which is, in essence,

<sup>16</sup> Stiegler presents the concept of a general organology, a theory that examines life as not solely biological but also technical. This organology considers life involving both organic and organized inorganic matter, building on Gilbert Simondon, and suggesting that the process of becoming an individual (individuation) involves three interconnected aspects: psychic, collective, and technical (Stiegler, 2020)

how humanity sustains its survival across epochs (Lemmens & Hui, 2017, 29). Thus, Stiegler sees the Anthropocene as the systemic toxicity of the current global organological configuration, rooted in industrialization and capitalist valorization. Technical organs increasingly assume human functions and responsibilities, creating a global technical milieu that, to Stiegler, is behind the deterioration of Earth's biosphere and humanity's self-destructive trajectory (Stiegler, 2016, 8).

It's evident that both philosophers Sloterdijk and Stiegler attempt to reimagine Heidegger's uncanny *anthropos* and its *technics*. They do not merely retrace the narrative of a downfall or decay in the history of Being, but attempt to conceptualize *anthropos* as a being *always in a state of flux*, just like its world. Whether humans inhabited their world spatially encased inside insulated and immune spheres and protective environments, or forged it temporally through a circuit of conserving, transmitting, and inheriting memory and knowledge over time, their relation to their environment has always been mediated by technology as emphasized by both philosophers Sloterdijk and Stiegler. The Anthropocene epoch emerges as a crisis point in human understanding and relationship with being and existence, and presents the height of technological *enframing* as described by Heidegger decades ago.

Moreover, Stiegler's critique of hypercapitalism and its exploitative industries brings to the forefront another entanglement between *anthropos* and capitalism as a *modus operandi*, emphasizing the latter's similar logic of surpassing its inherent limits for sustained economic expansion (Lemmens & Hui, 2017, 34). This relentless pursuit echoes the age-old Promethean ambition, which in the Anthropocene era, offers deeper insights into the human condition. To further understand this entanglement, in the following section, I will examine German philosopher Walter Benjamin's metaphysical interpretation of capitalism as a cult laden with mythic references, which takes us back to the different renditions of the Promethean myth we explored in the introductory passages.

#### *2.4 The Myth of Anthropos: Between Primordial Guilt and Human-ness in the Anthropocene*

Walter Benjamin's interpretation of capitalism, deeply influenced by Max Weber's seminal work "The Protestant Ethic and the Spirit of Capitalism," interprets capitalism as not just an economic system but a cult-like religion, presenting an image of humanity ensnared in an ever-intensifying web of *Schuld und Schulden*, guilt and debt (Benjamin, n.d.). Max Weber's analysis, often considered pivotal in understanding modern capitalism, posits that the spirit of capitalism originated from the religious ethos of Protestantism, particularly its concept of "inner-worldly

asceticism<sup>17</sup>." (Weber, 2001, xii). This ethos, according to Weber, has evolved into a force compelling every individual to incessantly work within the capitalist framework. Weber describes this as a destiny, likening it to an 'iron cage' that inexorably confines individuals until it encounters its ultimate limit: the depletion of natural resources, symbolized by the burning of the "last ton of fossilized coal" (Weber, Talcott Parsons' translation, 2001, 123).

In his 1921 fragment "*Kapitalismus als Religion*," Benjamin argues that this *Schuld/Schulden* (guilt/debt), deeply ingrained in capitalism, is a fundamental, genealogical category that predates and transcends the system, being primordial and mythical in nature. He perceives every historical event or condition as inherently deficient, never entirely self-contained or free from the influence of past and future events (Hamacher & Wetters, 2002, 83). In other words, every event owes its existence to something preceding it and is indebted to the subsequent states it enables. Guilt, in this sense, is not just a moral failing but a structural aspect of historical causation – where each historical event is also responsible for the non-being of something else, signifying a deficitary relationship to what is missing or absent (Hamacher & Wetters, 2002, 83).

Thus, the progression of time in history for Benjamin lacks conventional temporal divisions like past, present, and future. He describes it as '*completely improper temporality*' where historical events are densely interconnected in a web of guilt (Hamacher & Wetters, 2002, 84). Thus, for Benjamin, history is essentially an etiology, a study of causations, but instead, the causations of defects with any attempt to disrupt this chain only sustains this cycle of primordial schuld (guilt/debt) (Hamacher & Wetters, 2002, 84).

In his "Critique of Violence," Benjamin articulates a profound relationship between truth and myth, describing them as mutually exclusive. To Benjamin, myth lacks unequivocalness, and thus, it does not contain truth or even error ("The Interruption of Myth: Walter Benjamin's Concept of Critique," 2011, 5). Instead, myth exists in a realm where only knowledge of it is possible, marked by its crushing indifference to truth, its *mythic violence* (ibid.). This form of violence establishes and maintains laws through guilt, retribution, and bloodshed. He describes capitalism as a force that *casts a dream-filled sleep, and reawakens mythic elements within modern culture* ("The Interruption of Myth: Walter Benjamin's Concept of Critique," 2011, 11). Most importantly, he argues that capitalism reproduces mythical time, which he considers antithetical to historical time. The essence of mythical time, according to Benjamin, is the

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<sup>17</sup> Asceticism, as interpreted by Max Weber, refers to a behavioral response rooted in an ascetic mindset that views religious salvation as the outcome of active, ethically driven behavior. According to Weber, asceticism often entails an adversarial stance towards 'the world', due to its ethically meaningless structure and the distractions it presents that diverge from prescribed religious conduct. This can lead to 'world-rejecting' asceticism, exemplified by practices like monasticism, where withdrawal from worldly interactions is pursued to maintain focus on divinely ordained lifestyles (Stein & Storr, 2020, 524).

"eternal return," this cyclical, unending nature of suffering and repetition is what Benjamin terms the "*temporality of hell* (ibid)."

In the absence of atonement, humanity grapples with a sense of pervasive despair and anxiety of inescapable guilt/debt that Benjamin calls '*Sorgen*', and describes it as a mental state characteristic of the capitalist era, and its historical context (Robinson, 2021). Benjamin interprets capitalism as a religion-like phenomenon that, instead of providing atonement, intensifies these anxieties and universalizes guilt (Benjamin, 1996ff.). This paradoxical religious movement leads to a state where the only seeming escape is complete surrender to despair and self-destruction (Robinson, 2021). Thus, '*Sorgen*,' under the weight of unresolved guilt and debt, becomes at the heart of the continuous devastation of the world within the capitalist system.

Benjamin's fragments further examine *anthropos*' entanglement with guilt/debt through examining Friedrich Nietzsche's philosophies; he writes: "*This passage of the planet human through the house of despair in the absolute loneliness of his trajectory is the ethos Nietzsche defined* (Benjamin, 1921)." Benjamin interprets Nietzsche's *Übermensch*<sup>18</sup> as the figure symbolizing the culmination of humanity under the guise of capitalism (Benjamin, 1996ff.). In his view, the *Übermensch*, or 'Superman,' represents an individual who embodies the ultimate realization of capitalist religion (Benjamin, 1921). This figure does not seek redemption, purification, or atonement, but rather pursues a relentless and ultimately rupturing intensification of *human-ness* (*mensch-haft*) (Robinson, 2021). Benjamin's use of the compound term '*mensch-haft*' here is intended to convey an idea of *human-ness* as not a static essence but characterized by its capacity for attachment and bonding (Robinson, 2021). In this context, the *Übermensch* is seen as the historical human who has reached its zenith without altering its ways, through optimisation (*Steigerung*) or ever-increasing intensification of *human-ness* which propagates through an accretion of bonds<sup>19</sup> and liabilities, culminating in a 'guilt-nexus of the living' (Robinson, 2021).

Walter Benjamin's fragments seem to piece together a figure of man, akin to Nietzsche's *Übermensch*, as *anthropos*: a mythical being entangled in a history marked by a continuous accrual of defects and an inescapable primordial guilt/debt, aspiring to transcend through a relentless optimization and intensification of human-ness - *of everything to which it has become bound* (Robinson, 2021). Benjamin's examination of history, viewed as etiology entrapped within

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<sup>18</sup> Nietzsche's concept of the *Übermensch*, introduced in "Thus Spake Zarathustra" (1883–5), describes the idealized superior man who transcends conventional Christian morality to forge and enforce personal values.

<sup>19</sup> In his paper "Climate Justice: Walter Benjamin and the Anthropocene," Benjamin Lewis Robinson highlights that under the influence of capitalism, this human-ness attachment morphs into a form that can be likened to legal bonds or liabilities (*Haftung*), thereby creating an adhesive quality to human existence. See more: (Robinson, 2021)

a web of guilt/debt, subverts traditional perceptions of linear temporality and isolated historical events. It further suggests an intrinsically incomplete and morally charged history of humankind. Thus, in Benjamin's vision of history, the Anthropocene emerges not just as an outcome of remorseless capitalist exploitation and environmental destruction, but as a historical event on a planetary scale, underpinned by a linear temporality, and born from the *guilt-nexus of the living*. Here, the fallen *anthropos* emerges as a liminal figure haunting the human condition: a homogeneous and amoral force with causal capacity, always returning as a repressed spectre of accrued guilt/debt and melancholic longing burdening humanity with the self-destructive nature of the unattainable, the Promethean absolution.

### *2.5 Creatureliness, Memory, & the Human in the Anthropocene*

*Who is the "we"? We humans never experience ourselves as a species. There could be no phenomenology of us as a species. - Dipesh Chakrabarty*

In concluding this chapter, and through bringing together the philosophical threads laid by Martin Heidegger and Walter Benjamin, we begin to discern the hauntological nature of *anthropos*—an uncanny repressed figure that is concealed as a primordial myth, yet possesses a profound influence on the living, always returning as a driving force ensnaring humanity in accrued debt and melancholic longing. Yet, in the Anthropocene, an era falsely defined by a frail orbit around *anthropos*, humanity's multiplicity clashes with the homogenous anthropos, as the notion of a uniform collective humanity is increasingly called into question. This exploration seeks not only to reveal the limitations imposed by *anthropos* when central to any discourse, but also to echo the necessity for a radical shift in perspective through decentering *anthropos* and dismantling the subject. Through reimagining historicity and memory in the Anthropocene, this conclusion invites possibilities for new and emerging forms of resistance and possibilities for future imaginaries unbound by *anthropos*.

Dipesh Chakrabarty's own observation on the foundational and philosophical assumptions behind *anthropos* as a collective identity brings to the fore the limitations of an anthropocentric historical understanding and subjectivity (Chakrabarty, 2009, 221). To Chakrabarty, climate change confronts humanity with the burden of a collective human identity, an "us," that alludes to a form of universality *that escapes our capacity to experience the world* (Chakrabarty, 2009, 222). I add that this myth of a collective identity seems to *enframe* - through Martin Heidegger's framework - humanity in a reductionist paradigm of homogeneity where cultural multiplicities and historical specificity are negated in favor of a universalizing, technologically determined future. In this sense, *anthropos* as the collective human identity, *conceals* the structural

inequalities and power dynamics that have shaped humanity's technological essence, and have consequently contributed to the ecological crisis (Malm & Hornborg, 2014, 62-69).

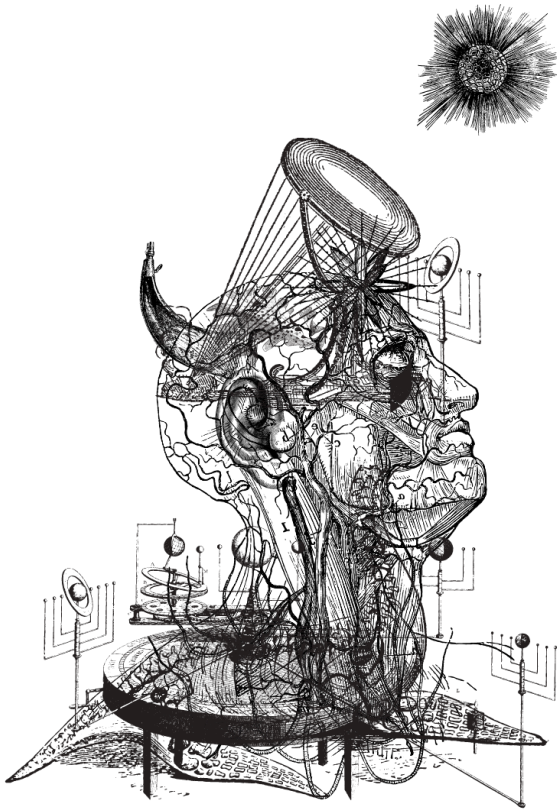


Figure 2. "Exploding of the Sky", Collage work using vintage illustrations © Maya Hershey, Tom Chalky

The Anthropocene, with *anthropos* as its central collective actor, becomes an exemplary discourse that views the planetary crisis solely through the reductionist lens of human survival and technological solutions, often prioritizing the survival and agency of the human species while overlooking the complexities of socio-political and ecological entanglements (Haraway, 2015, 159). Heidegger's critique of nature as a '*standing reserve*' and the condition of humans as '*homeless*' in the face of the *uncanny* becomes pertinent. This is the legacy of Prometheus, the long-standing Western perception of nature as an uncanny, sometimes even hostile, force that should be controlled and reconfigured, through what Walter Benjamin describes as *intensified human-ness and optimisation*, only to serve human ends (Diogo et al., 2017, 26). In this sense, such a perspective fosters the belief that humanity can continue on the same trajectory, relying on technology (such as large-scale geo-engineering projects) to solve impending problems (such as climate crisis), rather than fundamentally altering its approach (Diogo et al., 2017, 32).

However, this uncanny geological epoch has also brought fore humanity's deepest anxieties to the surface: its linear historical dimension in relation to the deep histories of nonhuman time, and its inherent vulnerability as a species entwined with 'terraforming assemblages' of humans, nonhumans, and *technics* (Woods, 2014, 134). Humanity has indeed employed its technologies as an intensification of *human-ness and optimisation*, as described by Walter Benjamin, but has inadvertently intensified its own vulnerability and dependency on both biological and non-biological entities and processes—its '*creatureliness*', as Pieter Vermeulen puts it (Vermeulen, 2017, 384). The Anthropocene confronts human beings with the inescapable social, biological, and psychological fragility of their domesticated spheres and environments, disturbing their cognitive agency and historical exceptionality as a species (Vermeulen, 2017, 385). In this epoch, human beings are no longer isolated in their species identity, but they reemerge as creatures embedded within larger ecosystems of nonhuman life-forms and processes, such as microbes, minerals, bacteria and other organisms that threaten, shape, and sustain their existence (Machin, 2019, 5).

In this sense, the Anthropocene reveals the inherent *creatureliness* of human existence, a state of vulnerability and dependence on biological and non-biological entities that is often concealed by *anthropos as a collective force*. This entanglement between human and nonhuman forces also implies a historical entanglement with vast, deep timescales of the Earth which challenges the traditional linear narrative of human history and the notion of humans as the sole agents of that history (Aravamudan, 2013, 9). If humans are embedded in larger non-human ecosystems and processes, then their memory and historical representations are also intertwined with a deep history that is recorded in planetary storage systems like the atmosphere, cryosphere, and Earth's surface (Vermeulen, 2017, 384). This entanglement between human and natural histories signifies that social memory, history, and temporality have always been more than just the purview of the liberal humanist subject, and this traditional linear history becomes a conscious effort to balance human agency against forces that challenge it (Colebrook, 2012, 188-190). Thus, human life in the Anthropocene extends beyond humanism, and humanity's understanding of cultural heritage and memory extend beyond human-centered narratives.

To imagine emergent forms of resistance and new possibilities in this epoch, humanity must attune itself to the world's heterogeneity and open-endedness, stepping away from *anthropos* as both a homogeneous entity and *way of being* (Harvey et al., 2019, 4). These imaginaries of human life beyond *anthropos* involve rethinking subjectivity and relationality, re-envisioning human existence as an '*existence-with*' (Lea, 2019). Martin Heidegger's notion of *dwelling* within the world, which Heidegger uses to describe an embeddedness in the world, becomes an interesting analogy that encompasses not just a physical presence but an ontological state of

being intertwined with the earth. Through reimagining a “*creaturely dwelling*”, one can reflect on a subject as a temporal entity that is always *becoming* and changing inside time-deepened ensembles of forms and processes, where its 'creatureliness' binds it in a shared fate with the non-human. This idea is reflected in John Wylie's post-phenomenological stance, drawing on the works of Derrida and Levinas (Lea, 2019). Wylie challenges Heidegger's interpretation of *being-in-the-world* by bringing forth the spectral nature of *dwelling*. Wylie's approach suggests a form of subjectivity that exists in a state of absence and passivity, a liminal state where the self is simultaneously present and lost, haunted by its own transience and estrangement (Lea, 2019). This spectral dwelling unsettles the certainties of subjectivity, opening up a space for a minimal subjectivity that is continuously shaped by its interactions and relations with the world around it (Lea, 2019).



Figure 3. “*Creaturely Dweller*”, Collage work using vintage illustrations © Maya Hershey, Tom Chalky

Perhaps it is as *creaturely dwellers* across the vast continuum of time, fully embedded in the entirety of an entangled geological, biological, and historical dimension, can humanity experience the world outside the confines of the humanist subject. In this world, the subject becomes a spectral being always *becoming*, and continuously transformed by the plurality of a shared existence and a multitude of human and non-human relations and processes. In the next chapter, I examine the contemporary digital milieu through the insights garnered so far, and further investigate the hidden traces of *anthropos* embedded in computational languages and algorithmic technologies. In an ever increasing digital entanglement, the multidimensional richness and plurality of the world is flattened even further into mere data points in a computational system. I hope to show how this dilution echoes anthropos' metaphysical longing for a universal language that encompasses all spheres of life and knowledge.

### Chapter 3: Anthropolos' Passing into the Digital

#### 3.1 Algorithms, Computational Languages, and Machine Learning: An Overview

The development of programming languages and computational thinking is deeply rooted in humanity's efforts and aspirations to understand and systematically organize the physical world (Islami & Longo, 2017, 179). Mathematics and programming languages are, at their core, instruments designed to enable the articulation and modeling of conceptual systems and ideas, and to make the world intelligible (Ensmenger, 2012, 756). In the following passage, I will demonstrate the historical progression of mathematical practices from Euclid's foundational works to the sophisticated Algebraic Geometry of the 20th century, demonstrating how the development of mathematical thought and algorithmic processes has been shaped by a confluence of cultural, philosophical, and practical influences (Narasimha, 2003, 3654). This exploration will place particular emphasis on the development of algorithms from their earliest beginnings with Indian and Arab scholars to their most recent role in the contemporary field of machine learning. I hope that this examination would highlight a certain understanding and interpretation of the world and a desire to make it calculable, that eventually became the backbone of AI systems and their infrastructure.

The evolution of mathematical thought and its application in science can be understood through the lens of two early distinct cultures and approaches to natural phenomena that have often overlapped: the Hellenistic model-makers and the Indo-Arabic algorisers (Narasimha, 2003, 3650). The Hellenistic or Greek approach follows the Euclidean method of progressing from clearly defined axioms or propositions to *theorems* through a process of logical deduction (Narasimha, 2003, 3651). For example, astronomer Ptolemy's work, divided into 13 books, begins by outlining a 'model' and its foundational assumptions (axioms). These include the propositions that the heavens are spherical and exhibit spherical<sup>20</sup> motion, and that the earth, also essentially spherical, rests at the center of the heavens, and then he uses this model to deduce other planetary motions (Narasimha, 2003, 3651). Central to Greek Geometry is the concept of "*seeing*," where "*theorem*" originates from the Greek word for "*vision*" or "*scene*," akin to what a spectator, the *theoros*, would observe in religious ceremonies from a detached, impartial standpoint (Islami & Longo, 2017, 180). This approach underscores the importance of distancing oneself to contemplate a problem objectively.

In contrast to the Hellenistic Euclidean tradition's focus on axiomatic logical deduction, Indian algorisers were more focused on aligning predictions with observations to reveal *drg.ganitaikya*—

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<sup>20</sup> The ancient Greeks perceived the circle as a figure of perfection, which influenced their belief that planetary movements followed circular paths. (Narasimha, 2003, 3651)

*the identity of the seen and the computed* (Narasimha, 2003, 3651). For example, instead of relying on circular models like Ptolemy's for deducing planetary motions, Indian astronomers would readily abandon these figures in favor of more optimized algorithms or calculation instructions that yielded better alignment with observational data (Narasimha, 2003, 3651). Recognizing that discrepancies between computational predictions and actual observations tended to increase over time, it was routine for distinguished Indian mathematicians to convene and adjust their algorithms, thereby ensuring their calculations stayed closely aligned with empirical observations (Narasimha, 2003, 3651). Rejecting traditional models and axioms, such as the circle as nature's perfect shape, could be seen as blasphemous for those subscribed to the Greek school of thought, potentially inciting a *philosophical crisis* (Narasimha, 2003, 3651).

This approach culminated in the 9th century with Muḥammad ibn Mūsā al-Khwārizmī<sup>21</sup>, a Persian mathematician and scholar influenced by ingenious Indian methods and whose work laid the foundations of Algebra as a systematic and rigorous discipline (Islami & Longo, 2017, 181). Unlike earlier unsystematic methods, Al-Khwarizmi's Algebra was expressed verbally<sup>22</sup> using words, with a focus on classifying equations, a method distinct from prior algorithmic practices (Islami & Longo, 2017, 181). Central to this was his invention of *al-shay'* or '*the thing*,' a concept that shifted the focus from the properties of entities to which the "*thing*" refers, to the relationships between different terms of an equation, thereby bridging arithmetic and geometry (Islami & Longo, 2017, 182). This approach enabled algebraic manipulations at a more abstract level. Al-Khwarizmi's methods also diverged from the traditional role of "*seeing*" in the Platonic realm, as the solution in Algebra was not immediately visible but emerged through a process of algebraic operations and algorithms (Islami & Longo, 2017, 182). In this sense, the philosophy driving Al-Khwarizmi's methods and those of his predecessors was more focused on devising the best algorithm to reveal inconsistencies or challenge adversaries, rather than pursuing an absolute "*truth*." (Narasimha, 2003, 3651)

The advancement of Algebra was instrumental in René Descartes' shift from Euclidean to Analytic Geometry (Narasimha, 2003, 3654). Influenced by algebraic methods, Descartes

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<sup>21</sup> Al-Khwārizmī authored '*Al-Jama'a wal-Tafreeq bil Hisab al-Hindi*,' a pivotal work that, once translated into Latin as '*Algoritmi de numero Indorum*,' profoundly influenced European thought in the subsequent centuries. His name, through this translation, eventually evolved into the term 'algorithm.' (Narasimha, 2003, 3651, 3656).

<sup>22</sup> The advancement in Algebra and algorithmic methods during the consolidation of the Islamic empire was intricately linked with the empire's broader intellectual efforts in lexicography and law. The 8th-century creation of an Arabic dictionary, involving an a priori classification of all lexical combinations, reflected a theologically neutral approach to language that equated the sacred text of the Quran with the language of pagans. This lexicographical effort, blending art with science, was crucial in establishing a methodical and systematic linguistic framework. Concurrently, the development of civil laws based on Quranic principles necessitated the creation of schools of jurisprudence and fostered the demand for new, more sophisticated methods of calculation (Islami & Longo, 2017, 181)

effectively devised a form of geometrical algebra, enabling the algebraic expression of geometrically defined curves, which provided geometry with a symbolic representation that was far easier to manipulate (Islami & Longo, 2017, 181). This methodological shift in geometry paved the way for future advancements by mathematicians like Isaac Newton and Gottfried Wilhelm Leibniz, particularly in the areas of derivatives and integrals (Islami & Longo, 2017, 181). Although Newton's work appeared to adhere to Euclidean principles, it was fundamentally influenced by a combination of calculus and algebra, profoundly shaped by Cartesian innovations, particularly the algebraic approach to geometry (Narasimha, 2003, 3654). This Cartesian philosophy was a pivotal moment in the European scientific revolution and its Enlightenment project, signifying the maturation of the mathematization of science (Narasimha, 2003, 3654). Newton's synthesis of classical Greek *axiomatism* with the sophisticated Indo-Arabic algebra and algorithmic tools, and inspired by Descartes, brought to a culmination the era of computational positivism (Narasimha, 2003, 3654). This synthesis of geometric methods with algebra opened new avenues in the exact sciences, reflecting the significance of this new and transformative European scientific approach.

These developments in mathematics and its various applications in understanding phenomena have closely mirrored and overlapped with the advancements occurring in automata and mechanics across the world, reflecting the changing philosophies and ideas of the times. As noted by cultural historian Jason Lahman in our interview:

*Enlightenment scholars like Descartes and the Scientific Revolution fundamentally altered the perception of automata over the centuries, transforming them from occult objects to sophisticated engineering achievements. This shift in understanding, recognizing the practicality of these devices beyond entertainment, was pivotal in integrating automata into industrial applications, thereby driving significant advancements in automation and mechanization that shaped the Industrial Age. Also, the mid-19th century's world fairs and exhibitions played an essential role in familiarizing the public with technological innovations of the industrial era, contributing to cultural integration and technological awareness. This growing public interest in machinery and the concept of relentless, linear progress in society and technology became a staple in popular culture. This significant technological shift, emphasizing the utility and practicality of technology, became a central theme during the transition from the 19th to the 20th century. A significant milestone in this shift was Charles Babbage's design of the Difference Engine and the Analytical Engine, sometimes referred to as the world's first computer. Ada Lovelace, recognized as the first computer programmer, interpreted and publicized Babbage's Analytical Engine. Though never built, Lovelace's detailed account of this steam-powered, programmable computer outlined its potential to manipulate not just numbers but also symbols, letters, and musical notes, marking a significant moment in early computing history.*

- Jason Lahman

As previously noted, the Greek-Euclidean tradition of axiomatic logical deduction and the Indian-Arab algorithmic processes embodied in Al-Khwarizmi's works, converged notably in Europe through Descartes (Narasimha, 2003, 3655). Descartes' approach which fused algebra with geometry later influenced Newton, whose seminal contributions blended Euclidean and algorithmic methodologies and laid the groundwork for the development of calculus and other advanced mathematical concepts (Narasimha, 2003, 3654). These developments became increasingly important in the centuries that followed, providing an "artificial language" both clear and capable of expressing complex, multi-solution, and even chaotic phenomena thanks to the adaptability of algorithmic processes (Narasimha, 2003, 3654). However, the full potential of this mathematical understanding was only realized with the advent of computing technology and Machine Intelligence. The pursuit to develop intelligent machines goes back to at least 1950 when computer scientist Alan Turing posed the question "Can machines think?" (Carter et al., 2018, 5). Only six years later, Machine Intelligence gained formal recognition as a field of research (Carter et al., 2018, 5). Central to Machine Intelligence is the technique of machine learning, where algorithms analyze vast datasets to identify patterns and learn from them (Carter et al., 2018, 5). By the early 1900s, the principles of calculus, linear algebra, probability theory, and tensor calculus were well-established, setting the stage for the upcoming Machine Learning (ML) revolution, where the age-old tradition of algorithising finds new expression.

In modern Machine Learning (ML), algorithms have moved beyond their traditional numerical applications to become complex frameworks that articulate and organize knowledge in ways uniquely suited to machine processing (Knuth, 1977, 63). The reemergence of algorithmic processes in the recent decades is largely due to the rapid advancement in computer science and the consequent surge in data availability this has enabled (Knuth, 1977, 63). Central to this transformation is recognising the adaptability and flexibility that often render algorithmic models more apt than traditional mathematical models for representing and organizing knowledge and data (Knuth, 1977, 63). However, the sheer complexity and scale of current data and the intricate, often nonlinear relationships inherent within it resist any straightforward or deterministic application of algorithms, which poses "*computationally intractable*" challenges in optimisation (Moitra & Massachusetts Institute of Technology, 2015). Thus, ML practitioners frequently turn to heuristic approaches— strategies that offer practical solutions without the promise of theoretical perfection (Moitra & Massachusetts Institute of Technology, 2015). These heuristics, while successful in practice, operate in a realm of uncertainty, where the reasons behind their effectiveness can be as elusive as the solutions they seek to provide. This has made the inner workings of these algorithms, particularly regarding their effectiveness, a black box

(Moitra & Massachusetts Institute of Technology, 2015). In this sense, the focus of modern algorithmic applications has shifted towards organizing, classifying, and manipulating vast and diverse datasets that train ML models to derive solutions, without explicitly programmed instructions.

To better exemplify how machine learning works, I will consider the analogy of a chess game, as explained by AI researcher Luis Sarmiento:

*In chess, the rules are well-defined, allowing a brute force approach to be theoretically feasible—every possible move combination can be tried to find the best one. However, this method lacks sophistication and doesn't translate well to more intricate real-world problems. For instance, coding a program to recognize flowers in a garden is a far more complex task than creating straightforward software like an email client. This complexity arises because the 'rules' for object identification in natural settings are not as explicit. Machine learning emerges as a solution to this complexity. Rather than explicitly programming every rule, machine learning algorithms acquire these rules by analyzing a multitude of examples. Taking the flower recognition example, a machine learning system can be trained by being shown numerous images of flowers, with the flowers in each image marked. The system then learns to identify the recurring pixel patterns associated with flowers. Essentially, it is deriving its own set of 'rules' based on data, allowing for accurate identification, even though these rules may differ from human logic. The more complex the problem, the more data is required for the algorithm to learn a wide range of patterns or rules. The exponential growth of machine learning in recent times can be attributed to the surge in data from interconnected devices and the corresponding need for greater computational power. With platforms like Instagram providing vast amounts of user-tagged images, there is an abundant supply of data for training machine learning algorithms. Yet, this abundance of data calls for more robust computing capabilities, and a consideration of biases in user input.*

- Luis Sarmiento

In the current digital landscape, algorithms have evolved from mere sets of instructions into complex, interchangeable languages and interfaces adept at navigating the murky waters of the uncertain and unpredictable nature of real-world data (Uricchio, 2017, 126). This significant shift in computational thinking moves away from a singular focus on accuracy and certainty towards a more nuanced engagement with the intricacies of data. However, as algorithms encode human knowledge and decision-making processes into a language that machines can read, learn from, and act upon, they inadvertently pass on inherent biases and limitations, challenging the notion of their impartiality (Gillespie et al., 2014, 168). In this way, algorithms become conduits for human subjectivity, and with the latest advancements in Machine Learning (ML), these

algorithms are equipped with capabilities for self-optimization and independent decision-making, adding layers of complexity to a proper understanding of their roles (Uricchio, 2017, 127).

As we've explored thus far, the historical backdrop of mathematical concepts, integral to the development of modern ML algorithms, reveals a narrative far from linear, echoing the diverse philosophical and cultural influences that have shaped it. It spun through the cosmos of early Babylonians and the planes of Euclid, articulated with Al-Khwarizmi, and found new dimensions in the works of Descartes and Newton centuries later. The recognition of distinct cultures within mathematics - a field often perceived as universally applicable - sheds light on the diverse ways different civilizations have approached natural phenomena (Narasimha, 2003, 3655). These processes, while originating from the regularities observed in nature, are laden with philosophical and epistemological considerations highlighting the non-arbitrary nature of mathematical knowledge (Islami & Longo, 2017, 190). In Machine Learning models, algorithms carry within them the philosophical considerations of their pasts, but they are often veiled by an aura of scientific objectivity that these methodologies are rarely brought to question—a perspective echoed by Tarleton Gillespie<sup>23</sup> in 2014, who noted the term's near-talismanic status in representing objective, scientific methodology (Gillespie et al., 2014, 182).

This perceived objectivity often bypasses the need for philosophical reflection before mathematizing concepts, a prerequisite evidenced in historical developments like al-Khwarizmi's "*the thing*" and Descartes' Cartesian dualism (Islami & Longo, 2017, 191). Reflecting back at the absence of absolute truths in ancient algorithms becomes crucially relevant today. Current debates over algorithmic bias are grounded in the assumption of an unbiased, objective standard – a notion that is, in reality, non-existent (Gillespie et al., 2014, 175). This oversight also manifests in the fallacies of big data and reductionist science approaches, attempting to distill complex systems into simpler components, often overlooking the interconnected nature of real-world phenomena (Crawford, 2021, 221). Another example is in the long-held notion of mind-body separation, a belief continuously challenged with advancements like robotics and embodied AI, but still persists in public discourse today (Birhane, 2018). This dualism perceives machine intelligence as disembodied from the material world, and the material world as a "*standing reserve*"<sup>24</sup> ready for extraction (Crawford, 2021, 7).

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<sup>23</sup> Tarleton Gillespie sheds light on the varying interpretations of algorithms, identifying three distinct uses that often distort their meaning: (1) to encompass the entire technological ensemble (model, data set, etc...), obscuring the complexity of the individual components, (2) to transform social phenomena into quantifiable data and simplify complex problems into model-based solutions, (3) to imply an 'objective' scientific case that imbues them with an aura of neutrality and objectivity.

<sup>24</sup> Reference to Martin Heidegger's notion of "standing reserve", see p. 24

In addition to their perceived neutrality, modern ML systems, in their quest for accuracy and refinement, have become voracious consumers of data and energy, as noted by Sarmiento above. The intricate and resource-intensive nature of these systems goes beyond computation, encompassing a broader environmental and ethical footprint. As these systems require more data for refinement, the associated energy demand escalates, illustrating the tangible impact of algorithmic processes, ML, and the wider technical ensemble they form. In the next passage, I will investigate the extractive practices that make up this larger AI system, where data becomes *the new oil* (Bridle, 2018, 2023, 156). Building on the insights gathered from this section, I will explore the implications of reducing world multiplicities into quantifiable data and the unchallenged politics underlying this practice. Drawing from the works of Kate Crawford, Tarleton Gillespie, among others who have critically dissected AI's nature as an extractive industry, we begin to see how humanity's pursuit to render the world comprehensible to machines comes with a hefty price. This brings into focus the homogenous figure of *anthropos*, as discussed in Chapter 2, highlighting its Promethean logic to transcend limits and expand into planetary and extra-terrestrial realms.

*3.2 Big Data: From Real-World Complexity to Informational Low-Fidelity*

*“Computers carry the semiotics of capitalism”*

— Gregers Anderson, Guattari and Planetary Computerisation

Artificial Intelligence (AI) is a field that extends beyond the notion of autonomous systems. The technical definition of Artificial Intelligence (AI) generally refers to the creation of computer systems capable of displaying *intelligent behavior* (Bostrom, 2016, 27). AI demonstrates this through capabilities like learning, reasoning, problem-solving, natural language processing, speech recognition, and visual perception or any behavior that mimics human intelligence (Bostrom, 2016, 33). Intelligence, in this light, would typically refer to how humans perceive their own abilities and place within the larger world, which is itself fluid (Crawford, 2021, 5). In recent years, AI technologies and processes have become increasingly ubiquitous, and the term itself has come to encompass a broad range of cultural, moral, economic, and philosophical implications (Crawford, 2021, 19). This is because AI encompasses the entire technological ensemble (machine learning algorithms, data, computational power, etc...) which is deeply reliant on extensive training with vast datasets that require both planetary and human resources.

In this section, I will demonstrate how AI systems have become a confluence of material and immaterial infrastructures embedded within—and reflective of—broader social and political

dynamics, particularly in the context of data and planetary resource extraction (Crawford, 2021, 18). This brings back Martin Heidegger's critique of technology as 'enframing', a concept we looked into in Chapter 2, where the earth, with all its living and nonliving organisms, is seen as a *standing reserve* ready for extraction. Such false pretenses pose significant entanglements: the earth actively responds to human-induced practices, bringing out an interfluous state between *becoming waste, and becoming mine* (Labban, 2019, 35). Meanwhile, nostalgic humans grapple with an ever changing digital milieu designed to flatten out their complex worlds into data points within computational systems (Crawford, 2021, 135).

Central to AI's transformative power is data. "*In the contemporary AI landscape, vast collections of data—ranging from personal images to online interactions—are extracted to train Machine Learning (ML) algorithms*", Sarmiento explains. The manner in which data is classified and interpreted often involves human input and decision-making, leading to potential biases and stereotypes (Crawford, 2021, 96, 143). This is because these systems often rely on simplistic categorizations of otherwise complex human identities and behaviors. Algorithms, whether designed by humans or self-generated by machines, serve as organizing frameworks for this data (Uricchio, 2017, 125). Simultaneously, machine learning models are inherently dependent on a large influx of data to enhance their accuracy (Crawford, 2021, 114). Yet, their approach to accuracy is asymptotic; they continuously evolve and improve but never reach complete precision, as Crawford notes. This insatiable demand for data not only propels the development of AI but also necessitates extensive resource extraction. This includes the mining of rare earth minerals vital for hardware, as well as the substantial energy required for processing massive data sets (Crawford & Joler, 2018). To better illustrate this, let's examine the below schematic.

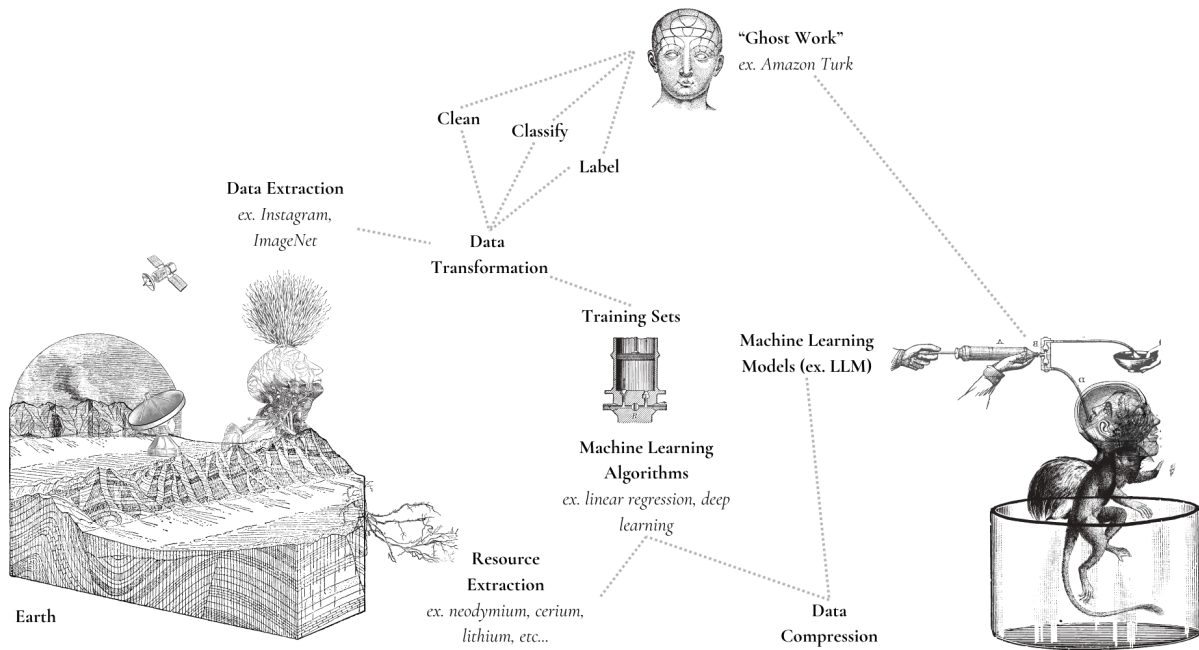


Figure 4. "Way of Seeing", Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky

Consider the example of face recognition machine learning algorithms which rely on vast datasets containing hundreds of thousands of faces. The creation of these datasets starts with scraping data from various sources, such as databases of prisoner<sup>25</sup> photos, social media platforms, or importing public training datasets like ImageNet and UTKFace (Crawford, 2021, 119-149). This data could then be labeled by low-paid workers<sup>26</sup> using platforms like Amazon's Mechanical Turk without any explicit instructions or safeguarding measures (Prabhu & Birhane, 2020, 8). In the mentioned example, the labels could imply "racial or gender slurs" against specific ethnic groups in facial recognition classification, such as "convict" or "transvestite" (Prabhu & Birhane, 2020, 3). Furthermore, these labeled datasets form the basis of training sets, stripped of their inherent meanings and contexts, and used to train algorithms that then attempt to predict, generalize, and generate outputs based on biased data (Suresh & Guttag, 2021, 4). One example is racial bias in access to healthcare, as shown in a [2019 study](#) which examined a

<sup>25</sup> The historical use of prisons as testing grounds for emerging technologies extends from the use of photography in the 19th century to today's AI-enhanced tracking cameras. See Prison Media (Kaun & Stierstedt, 2023)

<sup>26</sup> The labor behind AI is sometimes termed "ghost work," and includes the manual labor essential for maintaining and refining AI systems but often obscured from public view (Gray & Suri, 2019)

healthcare prediction algorithm that was used for over 100 million individuals and exhibited bias against Black patients (Obermeyer et al., 2019).

Similarly, AI's material footprint is significant yet often unaccounted for. This entire computational process relies on physical hardware: microchips composed of rare earth metals<sup>27</sup>, and sprawling data centers that consume vast amounts of electricity and water sources, impacting local communities (Crawford, 2021, 44). Additionally, the lifecycle of AI hardware, which requires complex supply chains, can quickly become obsolete, leading to a growing problem of e-waste, which can be challenging to recycle and often contains toxic substances (Yken et al., 2021). This energy-intensive infrastructure is often obscured by the notion of 'the cloud', an ethereal and weightless term that abstracts the very real, physical processes of computation (Bridle, 2018, 2023, 9).

In this light, Artificial intelligence (AI) emerges as a global, interconnected web, encompassing far more than just algorithms and data. It intricately weaves together a multitude of industries and processes, from manufacturing to complex data operations dispersed across the planet (Crawford, 2021, 48). This entanglement embeds AI within the Earth not merely as a backdrop for resource extraction but as an ever-evolving repository of resources, encompassing everything from the natural geological processes that form minerals to the sprawling *built environments*<sup>28</sup> and their byproducts, making up what Mazen Labban calls the "*planetary mine*" (Labban, 2022). Labban's notion of planetarity casts the planet as a living entity, and an active participant, continuously moving between 'mine' and 'waste' (Labban, 2022). This perspective redefines AI as a complex system deeply embedded within the planet's material and human history, necessitating a nuanced understanding of its multifaceted impact, particularly in the era of accelerating climate change (Crawford, 2021, 49).

Upon a closer examination on the process of labeling and transforming real-world data into machine-readable sets, it seems evident that such an initial stage is largely determined by human actors. The original context and significance of the data is altered, flattening its social, cultural, political, and historical dimensions into quantifiable metrics, marking a notable departure from real-world complexity into the informational low-fidelity in a machine learning landscape

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<sup>27</sup> 99.8% of the extracted material is discarded as waste, contaminating land and water streams. Only a mere 0.2% of the extraction yields the desired elements. (Crawford & Joler, 2018)

<sup>28</sup> The built environment is a complex system involving the material processes of construction and deconstruction. It includes the physical structures and infrastructures essential for production and maintenance, such as extraction, transportation, and communication facilities. This environment also encompasses the means of production and societal sustenance, involving the creation of commodities and the sustenance of life and society. Moreover, it involves various forms of waste management and accumulation, including slag heaps, scrap yards, landfills, incinerators, and neglected areas like "garbage slums" and abandoned infrastructures, highlighting a cycle of use and disuse. (Labban, 2019, 34)

(Crawford, 2021, 144). These datasets serve as *proxies*, as Crawford describes, “*mere stand-ins for the realities they purport to measure, thereby converting diversity into a uniform digital format*” (Crawford, 2021, 221). Machine learning algorithms, especially those tasked with predicting complex human attributes like age, gender, race, sexuality, or predicting future behaviors like criminality or likeability, then operate within the confines of these data *proxies* they're trained on. The culmination of this process is a feedback loop where ML models (such as LLMs) reintroduce this low-fidelity data back into the world, and this data, now devoid of its original richness and depth, impacts those who were classified and slowly shapes the worldview (Crawford, 2021, 146). In other words, Machine Learning algorithms reinforce a digital monoculture whereby the spectrum of recognized possibilities of what it means to be human, and what could be remembered from the past, are predefined.

### 3.3 Social Memory Decay: Data Mediation & the New Archive

In this subsection, I will examine the exhaustive impact of computational processes on the synthesis and experience of memory. I will begin by presenting a brief overview on the notion of social memory through Yuk Hui's works, understood here as a relational and cyclical phenomena that extends the mind and is *exteriorized* through *technics* (Stiegler, 1998, 4). This framework offers a comprehensive understanding of how memory is created, preserved, and transformed across generations and cultural shifts, particularly in the context of evolving technologies. Following this, I will examine the transition of such a relational phenomena into computational language more closely, highlighting the new transformative role of algorithms in archival practices and the organization of cultural artifacts. I hope to demonstrate how such computational rationalities, through data analytics and user behavior, now play curatorial and generative roles, reshaping and disrupting the cycle of what is retained, and what is forgotten.

In proposing the theory of an extended mind, theorists David Chalmers and Andy Clark propose that cognitive processes extend beyond the mind, encompassing the external tools and technologies used to process information (Clark & Chalmers, 1998, 7, 8). Clark and Chalmers assert that cognitive evolution is deeply dependent on the ability to reduce memory load and offload cognitive tasks across complex and technologically crafted structures (Clark & Chalmers, 1998, 11, 12). These structures include not only technological tools but also linguistic, social, political, and institutional frameworks. From this understanding, cognitive functions become continuously dispersed through and retained from the larger world, where "world" includes both the natural environment and the constructed technological landscape (Clark, 1998, 180, 62, 217).

Gilbert Simondon explains that each technical object encompasses both functionality (its practical use) and protocol (the set of rules or procedures that govern how it is used) and further

shapes how people interact with the object and with each other, creating a network of relations (Simondon, 1989, 249). In this light, technical objects (like tools, machines, or even digital technologies) foster a type of relations among humans that he describes as "*transindividual*" and become a form of social memory (Hui, 2017, 310). Bernard Stiegler extends this idea and conceptualizes technical objects as carriers of what he terms "*epiphylogenetic memory*" or *technological memory*, which is distinct from genetic and epigenetic memory, and can be found in tools, rituals, and languages (Hui, 2017, 311). This implies that technical objects have their own form of memory and history, which is not necessarily explicitly recorded but is embedded in their invention and usage (Stiegler, 1998, 65).

The relationship between human beings and their technological environment is further explored by André Leroi-Gourhan, an anthropologist and paleontologist, who described memory as a process of *exteriorization* within ethnic or cultural groups (Hui, 2017, 310). In this sense, as humans create and interact with technical objects they exteriorize certain aspects of their experience and culture. These exteriorized forms then influence human thought and behavior, becoming reintegrated into the human experience in a new way to allow further exteriorization (Hui, 2017, 311).

This vast network of "*transindividual*" relations mediated through technology makes up the social memory (Hui, 2017, 312). Thus, Hui presents a tripartite reflexive syntheses of social memory which involves implicit and explicit exteriorization (Hui, 2017, 312):

1. Exteriorization of Memory: *The first synthesis* involves the exteriorization of memory through tools, rules, and rituals and is embedded in everyday practices and inventions. It is transmitted through generations without being explicitly articulated (Hui, 2017, 314). For example, a community's use of a specific tool or participation in a ritual can be a way to remember and pass on important cultural or practical information.
2. Construction of Explicit Historical Memories: *The second synthesis* deals with the explicit and conscious creation of records that document history. These records can be in the form of written documents, monuments, or other forms of archival material and are often informed by political intent (Hui, 2017, 314).
3. Anamnesis of the Unmemorable: *The third synthesis* is the process of recalling or acknowledging intangible aspects of history or experience that might not be explicitly recorded or might be overlooked (Hui, 2017, 314). For instance, consider the collective emotional and psychological impact of a major historical event like World War II.

Leroi-Gourhan examines the interrelations between the living being and its external and internal milieus, through technological intermediaries (Leroi-Gourhan, 1945, 363). He explains that the internal milieu comprises aspects intrinsic to the physiological and biological necessities and the societal functions within an ethnic group, including its own 'technical milieu'. This technical milieu serves as a kind of interface or membrane between humans and their external environment, playing a dual role. Firstly, it acts as a filter, protecting the interior milieu by mediating interactions with the external milieu while maintaining geographic and historical specificity. Secondly, it is adaptable, absorbing and incorporating into the interior milieu external influences and technologies from other groups (Hui, 2017, 313).

When the technologies of one ethnic group are more advanced than the other, such exchange can't be incorporated<sup>29</sup> properly within the latter group's specific social and economic system (Simondon, 2014, 319). In this case, the technical milieu is disrupted as it no longer protects the interior milieu from the exterior one, resulting in the slow decay of the affected group's own *implicit collective* memory (first synthesis). Such a disruption is ever more pronounced in the contemporary landscape. (Simondon, 2014, 319)

Digital technologies have accelerated the expansion of social memories, a process that, according to Leroi-Gourhan, began in Europe in the eighteenth century (Hui, 2017, 315). This era saw the social memory engulf a vast array of knowledge – from the entirety of antiquity to the sciences and arts – all documented in books (Leroi-Gourhan, 2018, 262). The twentieth century, a period significantly shaped by world wars and rapid urbanization, also brought to the forefront the philosophical imperative of preserving memories on the brink of being lost, primarily through documentation (Hui, 2017, 309). Leroi-Gourhan observes that human memory is unable to retain all these exteriorized memories, leading to *reliance on artificial intelligence* (Hui, 2017, 315). He describes this phenomenon as 'mechanical memory', and is *constituted through experiences fed into machines by humans, based on a preexisting program and a code rooted in human language* (Hui, 2017, 316). This form of memory represents an explicit exteriorization, where collective memory, typically implicit, is explicitly expressed in technical terms (Hui, 2017, 316).

Digital exteriorization of memory isn't new, yet current technological advancements have propelled it to unprecedented levels, as Hui explains (Hui, 2017, 315). The evolution of artificial intelligence (AI) is steadily replacing a range of human activities. This shift extends beyond the

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<sup>29</sup> The importation of Western technologies to China following the Opium Wars (1839-1842 and 1856-1860) serves as a notable example, as Hui posits. Post these conflicts, the Ching dynasty, having faced defeat, was compelled to adopt military and industrial technologies from Europe and the United States. This influx significantly disrupted the previously stable and robust technical milieu in China, which had flourished until the sixteenth century. (Hui, 2017, 313) Further examples could be examined in the Middle East during and after Ottoman, British, and French mandates.

automation of physical tasks, characteristic of the 19th-century industrial landscape, to encompassing cognitive processes as well (Hui, 2017, 315). As a result, tools and technologies are becoming increasingly standardized in functionality, distancing themselves from their original geographic and cultural contexts (Hui, 2017, 315). Social networking platforms exemplify this trend, having been integrated into nearly every culture, as Hui exemplifies. This uniformity across different tools and technologies is a direct outcome of technological globalization and new forms of industrial standardization (Hui, 2017, 315). The globalization of digital technologies leads to a synchronization and conformity of gestures and thoughts across different cultures.

Further, digital technologies have made it possible to record and archive traces from the first synthesis of memory, which involves the exteriorization of implicit memory embedded in everyday practices (Hui, 2017, 316). These traces are increasingly recorded and utilized by platforms like Google, Facebook, and Amazon as user behavior, or *cookies*<sup>30</sup>. This has led to the formation of a new kind of 'live archive,' where behavioral data are not just raw metrics but are imbued with semantic meanings, making them readily searchable (Hui, 2017, 316). Meanwhile, the explicit forms of social memory, such as historical archives, are undergoing a rapid process of digitization (Hui, 2017, 317). Institutions worldwide are adopting digital strategies to open their archives, embracing interactive models, crowdsourcing, and open access policies. As a result, billions of images and pieces of data are being generated every second, contributing to a continuous, though often unconscious, effort to create living memories from the past (Hui, 2017, 317).

As a result of these developments, the synthesis of memory increasingly revolves around the production and consumption of data (Hui, 2017, 317). Collective memory is now frequently shaped and influenced by big data analysis and digital behaviorism. This means that rather than relying solely on traditional methods of remembering and recording (like written or oral histories), digital data is used to capture, store, and analyze memories. This data-driven approach often involves big data analysis (examining large sets of data to uncover patterns and trends) and digital behaviorism (understanding human behavior through digital interactions). Moreover, as digital technologies become more ubiquitous, digital objects (like files, images, or social media posts) become increasingly normalized, making data a key medium through which the world is remembered and experienced (Hui, 2017, 318). In this context, the distinction between the first synthesis (*implicit behavioral memory*) and the second synthesis (*explicit historical memory*) diminishes, as both are increasingly mediated through data (Hui, 2017, 318).

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<sup>30</sup> Cookies are used by web servers to save information on a user's device, like items in an online store's cart, or to monitor user activities such as button clicks, logins, and previously visited pages. (Ignat et al., 2021)

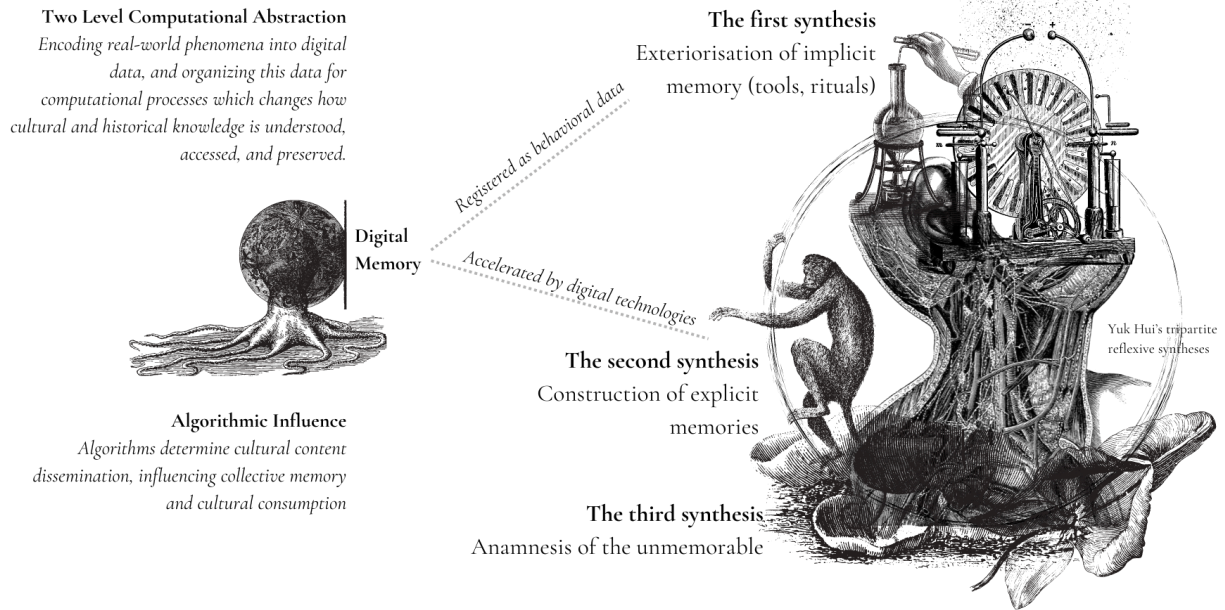


Figure 5. "Reconfiguration of Social Memory", Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky

To position Leroi-Gourhan's "mechanical memory" in a more contemporary landscape, let's take a closer look at the computational processes that govern such phenomena. Abstraction in computational terms refers to the process of simplifying complex real-world phenomena into more manageable forms that a computer can process. The process of making phenomena computable involves two levels of abstraction (Berry, 2017, 104). Firstly, it needs to be abstracted or encoded into a digital symbolic system that a computer can read (Berry, 2017, 104). For instance, translating human behaviors or physical events into digital data involves converting these complex, nuanced occurrences into a simplified, symbolic format whose basis is binary code. The next level of abstraction involves structuring this encoded data into a "grammar of actions" that allows a computer to perform specific operations on it, like sorting, analyzing, or using it to make predictions (Berry, 2017, 104). This means organizing the data in a way that aligns with computational logic and algorithms. The abstractions and computations done by the computer are applied back to the physical or real world (Berry, 2017, 104). This could mean using the insights gained from data analysis to inform real-world decisions or actions, or having a computer control a physical process based on the computations it has performed.

The ability of a system to perform a range of functions effectively depends on how well it can abstract, or '*capture*,' real-world data and phenomena (Berry, 2017, 104). Philip E. Agre's concept of '*capture*' is pivotal here, referring to both the acquisition of data for databases and the creation of ontologies modeling physical systems (Agre, 1994, 107). Once a model is created through abstraction, it becomes a lens through which the computational system views and interprets the world (Agre, 1994, 107). The abstraction makes diverse forms of knowledge *computable, comparable, and amenable to re-engineering*, thereby reshaping the world to align with the initially abstracted model (Berry, 2017, 104). In this sense, abstraction in computational systems doesn't just translate the real world into a digital format; it can fundamentally change, alter, or even distort the way knowledge, practices, and artifacts are understood and used.

Amazon's warehouse system, employing 'chaotic storage' algorithms, exemplifies this, David Berry explains:

*Amazon employs a 'chaotic storage' system in its warehouses, characterized by a unique approach to organizing physical objects. In this system, items are not grouped together based on similarity. Instead, they are distributed across various locations in the warehouse, with their positions tracked in a database using barcodes. This method is driven by an algorithm that optimizes space utilization by calculating the exact dimensions of products and available shelf space. Computer-controlled robots are used to place items in the most efficient locations.*

Here, objects are abstracted into data entries, stored efficiently by robots in a space that, to the human eye, seems disorganized but is, in fact, a physical manifestation of algorithmic logic.

Such abstraction has a significant impact on social memory. Culture, when digitized, undergoes a similar metamorphosis, transformed by the computational processes that govern it (Berry, 2017, 104). The archival systems, traditionally seen as passive repositories maintained by memory institutions like museums, libraries, and national archives, are now active, generative spaces (Berry, 2017, 104). The second synthesis, as examined by Yuk Hui above, which deals with explicit exteriorization and archival practices were institutionally driven, grounded in political, historical, or scientific valuations. However, with the advent of digital technology, a new layer emerges: the '*second-order archive*,' which is a database (or *metadata*) about the archive itself (Berry, 2017, 106). This metadata can include information about how the archives are used, which can inform decisions about what to keep or discard. Computation, by enabling easy access and reorganization of data, potentially undermines the traditional roles of archival and memory institutions, leading to *disintermediation* – the reduction or elimination of intermediary roles in the archiving process (Berry, 2017, 107).

Pietro Bianchi exemplifies this and describes a similar disintermediation in film institutions and wider social and political structures:

*“The emergence of data mediation has triggered profound disintermediation in film distribution and consumption, thereby diluting traditional platforms like cinema magazines and film clubs. This shift towards digital platforms allows individuals to independently curate their selections, like compiling lists of specific film genres or eras, thus democratizing film criticism to some extent. However, this also leads to isolated ‘film canon bubbles’ that seldom intersect in public discourse. While previously film experiences were collective and facilitated public debates, this new trend of disintermediation, more pronounced in political theory, represents a broader shift from traditional mediating institutions, paralleling changes in structures like trade unions and political parties.”*

- Pietro Bianchi

Moreover, algorithms play a crucial role in curating and organizing information in such an environment. They create new ways of accessing and understanding archives, leading to an *'augmediated'* archival imaginary (Berry, 2017, 106). The digitization of archives leads to the quantification of data, which then feeds back into qualitative judgments about what should be preserved. Usage statistics and other metrics become key in evaluating the importance of various items in the archive (Berry, 2017, 106). In the cultural landscape, algorithmic systems similarly leverage large datasets that contain implicit traces from the *first synthesis* of memory to curate and determine what cultural content to push out. This is primarily evident in recommendation systems and predictive models utilized by platforms like EchoNest, which analyze vast amounts of user data and musical texts to predict future preferences based on past behaviors (Uricchio, 2017, 130).

The fundamental characteristics of computation – like *modularity, iteration, and optimization* – permeate through the levels of operation, altering the nature and function of archives (Berry, 2017, 108). The computational process recasts the material world, abstracting reality into forms dictated by digital analysis (Berry, 2017, 109). Thus, in the digital age, the archive, and by extension social memory, become inextricably entangled with the computational systems and algorithms that shape, organize, and mediate them. Understanding social memory as a product of media organization brings about a new form of engagement with culture (Berry, 2017, 109). In such a dynamic digital milieu, the way information is stored undergoes a significant transformation. Traditional long chains of memory, preserved over time by memory institutions, are now reconfigured into shorter, more dynamic memory chains that are constantly updated and refreshed by computational processes and algorithms (Berry, 2017, 109).

In conclusion, the plurality of technical milieux, once serving as protective membranes for ethnic groups while mediating an exchange with the external world, have been fundamentally disrupted. With technical organs like artificial intelligence increasingly assuming human functions and responsibilities and spreading across different cultures, ethnic groups have been subsumed into one technical milieu encasing the world (Stiegler, 2016, 8). In this milieu, the diverse, implicit technological memories intrinsic to different ethnic groups become severed from their original cultural and geographic contexts. This global convergence not only conceals the nuances of *technics* like algorithms, which once bore the philosophies of ancient Babylon, India, and the Islamic world, but also risks the decay of the implicit social memory that these membranes were meant to mediate and protect.

The synthesis of different forms of memory and knowledge into a unified digital framework altered the dynamics of social memory. The widespread adoption and standardization of digital technologies across different cultures have led to a synchronization and assimilation of gestures, thoughts, and memories. Such digitization has blurred the lines between different syntheses of memory. The first synthesis, concerned with the exteriorization of implicit memory embedded in daily practices, now finds its traces recorded and utilized as behavioral data. Meanwhile, explicit forms of social memory are digitized at a rapid pace, leading to the creation of 'live archives' where every moment is continuously documented and transformed into a living memory. This paradigm shift has seen the synthesis of memory increasingly revolve around the production and consumption of data, leading to a homogenous body of shared social memories *watched over by a global technical milieu*.

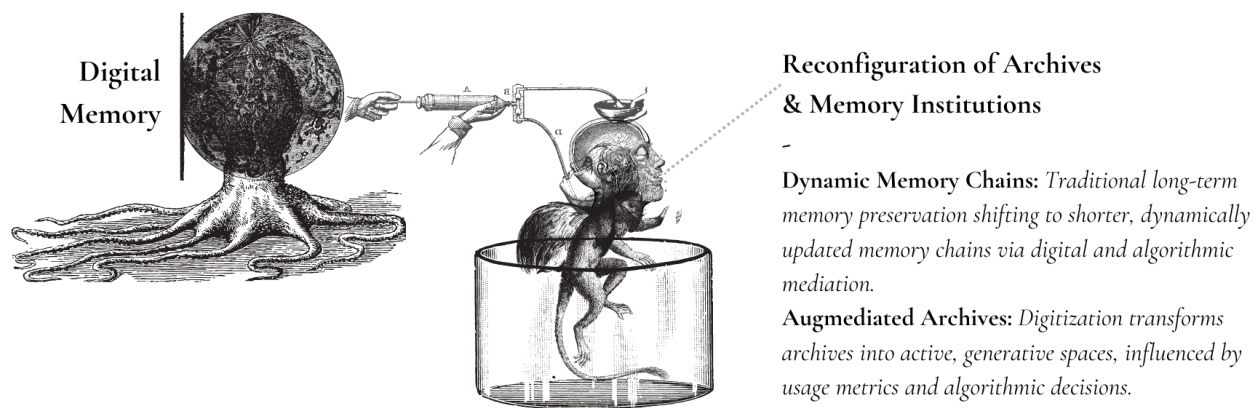


Figure 6. "Reconfiguration of Social Memory", Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky

This amnesiac and homogeneous memory chain of explicit artifacts, continually updated and governed by computational processes and algorithms, seems to belong to the undifferentiated '*anthropos*.' As we've explored in the previous chapter, *anthropos*, in its essence, imposes a collective identity that suggests a universality beyond lived experiences. The intensified exteriorization of explicit memory, accelerated by contemporary technologies, ironically becomes the cause of forgetting, as it also intensifies a *vulnerability* – a severance from social memory itself. As a result, the subtleties and nuances of implicit social memory, once preserved through a continuous cycle of exteriorization and reintroduction, erode into behavioral data ready for harvest.

## Chapter 4: Scholarly Dialogues and Confluence

### 4.1 In Conversation with Scholars

In this chapter, I present the insights and reflections gained from dialogues with four distinguished scholars, each hailing from diverse academic and professional backgrounds. These in-depth conversations and reciprocities, detailed in full within the appendix, play an integral part of the work done towards the thesis. My objective from such collaboration was to examine the question of technology and the Anthropocene through a multifaceted lens, bringing together various strands of professional experience and academic thought. Despite their distinct expertise and fields of study, their confluence in grappling with notions of subjectivity, memory, and intelligence across disparate disciplines presents additional opportunities to explore an already growing field of inquiry. This leads me to consider: How might such a confluence of diverse experiences and academic investigations provide valuable insights on humanity's entangled relationship with technology & memory in the Anthropocene?

To answer this question, I begin with an in-depth exploration on the history of automata and its philosophical and sociological undercurrents, with cultural historian Jason Lahman<sup>31</sup>. This engagement set a solid foundation for the subsequent discussions, providing a nuanced understanding of the Western perspective on automata and their transformative role in societal evolution. Next, I examine the intricate computational processes that drive artificial intelligence, algorithms, and the emergence of digital monocultures with AI researcher Luis Sarmento<sup>32</sup>. Following this, I examine information access and memory in the digital age with psychoanalyst and scholar Pietro Bianchi<sup>33</sup>. Bianchi's exploration of the direct pathways forged by disintermediation provided critical insights into how our engagement with information and memory is being reshaped in a world of pervasive algorithms. Finally, I look into the intersection of technology and human-environment interactions with human-environment geographer, Mazen Labban<sup>34</sup>. His work combines critical social theory, political economy, and aspects of industrial microbiology and biotechnology.

In the latter part of this chapter, I present the commonalities from these diverse yet interconnected scholarly perspectives. I strongly encourage readers to engage deeply with the

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<sup>31</sup> Jason Lahman, a cultural historian, is also a skilled visual artist and poet. See more: [www.jasonlahman.com](http://www.jasonlahman.com)

<sup>32</sup> Luis Sarmento is an expert in Artificial Intelligence, with a focus on Machine Learning. See more: [www.pt.linkedin.com/in/luissarmento](http://www.pt.linkedin.com/in/luissarmento)

<sup>33</sup> Pietro Bianchi's research is a unique intersection of Marxism, Lacanian Psychoanalysis, and cinema studies as an ideological formation. See more: <https://duke.academia.edu/PietroBianchi>

<sup>34</sup> Mazen Labban is a Visiting Assistant Professor of Geography at Rutgers University and a former Senior Editor at 'Capitalism Nature Socialism'. He authored 'Space, Oil, and Capital' (Routledge, 2008) and co-authored 'Unholy Trinity: The IMF, World Bank and WTO' (Zed Books, 2003). [www.rutgers.academia.edu/labban](http://www.rutgers.academia.edu/labban)

dialogues presented in the appendix. These conversations are not only integral to my thesis but are intended to serve as a rich resource for the readers themselves. Additionally, through such engagement, readers are invited to discern and formulate their own interpretations regarding the archetypal patterns that have historically shaped relationships with artificiality and technology, further contributing to emerging discourses that move beyond the human.

#### *4.1.1 Jason Lahman: From Artificial Life to Machine Intelligence*

From ancient myths and legends to contemporary science fiction and technology, the concept of artificial life has captivated the human imagination since antiquity. Jason Lahman, a cultural historian of technology, brings a unique historical perspective on artificial intelligence, and the different relationships humanity has had with their perceived notion of “artificiality” and “biological”. Holding an MA in modern European history with an emphasis on the history of science, Lahman's academic journey has also encompassed design and art history, enriching his insights into technology's cultural impact. As a lecturer, he has explored a range of topics, from Impressionism to the cultural history of robots, demonstrating his diverse expertise.

My objective with Lahman was to look into the historical and cultural dimensions of technology, specifically focusing on humanity's ever evolving relationship with artificiality. I aimed to examine how different societies have conceptualized and interacted with artificial life forms, from ancient automata<sup>35</sup> to modern robotics. When I initially reached out to Lahman for an interview, he graciously took the time to identify gaps in my thinking and suggested a comprehensive bibliography and a course on the cultural history of automata. This course probed the historical backdrop of making artificial doubles from antiquity to the present, and was rich in information about the philosophies and ideologies that have shaped each era. Through these insights I was able to discern some ways of thinking that still echo to this day. Moreover, such deep engagement served as an invaluable introduction to my interview with him and a rich introduction to the subsequent interviews in this series.

Lahman emphasized the deep historical multiplicity of artificial life since antiquity. More than just inanimate objects moving with the aid of intricate mechanisms, these creations embody an ever-evolving understanding of life, origins, and meaning. As such, they serve as both tangible artifacts of technological innovation and powerful symbols reflecting humanity's deepest desires, fears, and philosophical musings. On one level, automata were tangible manifestations of humanity's scientific prowess and intellectual curiosity, like the Greek's Antikythera, a device for mathematical astronomy. On another, they were tools of societal influence and prestige, used

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<sup>35</sup> Automaton—derived from the Greek word for "self-moving"—were the earliest attempts at creating artificial life (Mayor, 2020).

to impress others and assert power, from the wine-serving maids of Philo of Byzantium to Heron of Alexandria's automatic temple doors. But perhaps most fundamentally, creating robots was an act of mirror-holding, a way for humanity to reflect upon its essence, capabilities, and limitations, Lahman explains. For instance, the Greek myths of Prometheus and Epimetheus highlighted themes of creation, control, and humanity's quest for knowledge, paralleling the narrative arc seen in the history of automata.

Lahman opened up a plurality of pasts that have continuously shaped automata, from the East, where automata were used for entertainment and influence, to the Islamic world's crucial role in preserving and expanding Greek texts on automata. He touched upon the transfer of this knowledge to Europe during the Crusades and the subsequent use of automata by the Church to instill awe and fear. The Renaissance marked a pivotal period, with figures like Leonardo Da Vinci enhancing ancient engineering principles to create intricate automata for various purposes, including military advancements. Lahman also noted how the Enlightenment era's automata mirrored the universe's newly discovered mechanics, influenced significantly by clockwork. In discussing the modern era, Lahman highlighted the philosophical shift with figures like Descartes, who conceived the human being as a pneumatic machine, reinforcing the link between the human body and automata. He related the rise of automata in public spectacles during the Bourgeois society to their integration into industries, marking the beginning of the Industrial Age.

Lahman suggests that the legacy of Cartesian dualism and the effects of *Social Darwinism* continue to significantly influence our intricate relationship with technology. These philosophical frameworks not only inform the development of new technologies but also shape the regulations that govern their use. Despite being challenged by many historians, the notion of 'linear progress' central to *Social Darwinism* still subtly impacts societal and technological landscapes. This influence extends to the realm of ML algorithms, the guiding principles behind our digital interactions. Far from being impartial, these algorithms are shaped within environments laden with power dynamics and ideologies centered on growth and progress. Lahman points out that these technological systems, particularly in areas like social media, are underpinned by values and biases that reflect the wider influence of major tech companies based in Silicon Valley.

Reflecting on my interview with Jason Lahman and the broader implications of our discussions, I found that the enduring ethos of quantification, a vestige of the reductionist paradigms of the Enlightenment and the earlier Humanist Renaissance, is still present. This tendency to quantify – to assign numerical values to the inherently qualitative aspects of life, such as intelligence or likeability– is increasingly prevalent in our data-driven world. While useful in certain analytical

contexts, this approach risks distorting our understanding and appreciation of these complex human experiences, reducing them to mere data points devoid of their inherent complexity. In the current digital era, data has become a symbol of unprecedented accessibility to information, marking what could be described as the age of the archives. Vast amounts of information not only accumulate but also actively shape our daily lives and interactions.

However, within this digital profusion, we find ourselves inadvertently perpetuating age-old ideologies passed down through history. The algorithms that underpin our ML models, seemingly impartial, become amalgamated with the pervasive repurposing and recycling of mythical ideologies and biases that seem to serve the humanist subject. Artificial Intelligence, with its aura of spectrality, embodies these biases and myths, functioning ubiquitously yet rarely examined and questioned. However, it is also crucial to recognize that history is not a closed loop. This realization invites us to move beyond the burden of a linear past, fostering an environment where multiplicity can thrive. Maybe, as Jason Lahman says, other pasts could inform multiple futures.

Standing at what I believe to be a critical juncture in our history, I see the advent of Artificial Intelligence and the development of symbiotic relationships with technology as a potential catalyst for a reimagining of seemingly static notions of self, subjectivity, and intelligence. This shift is not about diminishing human intelligence but rather an embeddedness in larger non-human ecosystems with myriad forms of intelligence. This could very well be the key to crafting an alternative discourse that defies the prevailing ideologies, guiding us towards multitudes of future.

As Lahman suggests, acknowledging the multiplicity in history, time, and memory is essential in this endeavor. By exploring other pasts, we might unlock the potential for multiple futures, opening new pathways for understanding. This is a journey towards a future that is not predefined but is *always becoming*, and continuously shaped by a rich multiplicity of experiences and perspectives, both human and beyond.

#### *4.1.2 Luis Sarmiento: A Discourse on Algorithms, Ideologies, and the Uniformity Crisis*

As we continue to expand the boundaries of our digital world, artificial intelligence (AI) and machine learning have become ubiquitous, profoundly influencing almost every aspect of our lives. This dynamic relationship between AI and us, the manner in which these systems function, and the broader implications on society and environment, are not always well-understood. And in the world of technological progress, the undercurrent of ideological foundations is often overlooked. This is primarily because the technology we use daily, such as our smartphones, search engines, or recommendation algorithms, is perceived as neutral. However, they embody

specific ideological leanings in their designs and applications, inevitably influencing our experiences and interactions.

Luis Sarmiento, a distinguished scholar in AI and ML, offers an invaluable perspective on this intricate matrix. His professional tenure spans over a decade and a half, during which he has led research teams in venerable institutions, such as the University of Porto and the National Foundation for Scientific Computing, Portugal. Furthermore, his forays into the industrial domain have led to seminal contributions in tech stalwarts like Portugal Telecom, Amazon, and Google, elucidating the nuances of Search Engines, Recommender Systems, and Dialog Systems. 2021 marked a pivotal year for Sarmiento, as he co-founded Inductiva Research Labs to gather up a team of Scientific Machine Learning researchers, delivering scalable computing solutions to problems in the fields of engineering and science.

The objective of my interview with Sarmiento was a conversation aimed at understanding and dismantling AI systems and algorithms. Initially focused on the operational mechanisms of AI, the discussion naturally evolved into broader themes of intelligence and the creation of digital monocultures.

In my conversation with him, Luis Sarmiento demystified AI's operational intricacies and the philosophical undercurrents shaping the digital experience. The conversation dove deep into the operational mechanisms of ML algorithms, our understanding of intelligence itself, and the different ideologies endorsed in our technologies leading to the creation of a 'digital monoculture'. The Silicon Valley culture fostered a uniformity across different tools and technologies, and is representative of the wider technological globalization and the ongoing systemic assimilation in industrial standardization. Through this dialogue, Sarmiento explained how the swift pace of technological change and the pervasiveness of such monocultural tendencies have spurred feelings of nostalgia among individuals, and this nostalgia has been consequently leveraged as a strategic tool, sometimes with intentions to divide, as with the case of neo-fascist movements.

He further elaborated on the significant shift of power where technology's foray into commercial industries brushed against the strategic interests of governmental entities like DARPA, particularly in the field of information technology. This transition has fundamentally altered the landscape of regulatory debates and technology discourses. While our sources of information might seem more democratized in the digital age, they are often merely modern avatars of longstanding media monopolies that have persisted over time. The significant difference today is the platform and scale. Silicon Valley's techno-utopian vision, with its promises of progress and evolution for both science and mankind, is redefining the socio-political landscape. This utopian

ideology presents a new face of capitalism—one that, while championing diversity and global integration, dilutes cultures in favor of a ubiquitous monoculture. There's an inherent danger in seeking a singular solution when the world is built on a multiplicity of perspectives and truths.

He emphasized the risk of sidelining the diverse perspectives and nuances, as we attempt to extract and pinpoint a single, definitive answer from the vast array of data. It then becomes evident that while technology has amplified access to information, it has also inadvertently bolstered divisions, fake news, and the rise of nostalgia as a counter-movement in the face of overwhelming globalization, reflecting a deeply entrenched human desire for distinct identity in a world hurtling towards uniformity. As AI's tendrils spread deeper into society, over-reliance on computational methods might simplify complex realities, and the pace of progress necessitates a more nuanced understanding of history.

Further, Sarmiento discussed the meteoric rise of machine learning processes, driven by a data-centric approach, and its implications. He pointed out the escalating demand for energy from data centers, emphasizing on the environmental footprint.

The insights gleaned from my conversation with Luis Sarmiento have led me to a deeper contemplation of the current technological landscape. These modern technological intermediaries, although subtly reflecting classical philosophical thought, mark a significant shift in our perception and interaction with the world. Based on Sarmiento's experience with Silicon Valley's culture, it appears to embody what Walter Benjamin describes as a cult of unrestrained capital and scale, replete with mythic references like unicorns, angel investors, and utopian dreams. It also becomes evident that engaging critically with the inner workings of AI systems and ML algorithms is not just necessary but imperative. By challenging their defaults and questioning their judgments, we open doors to move beyond the traditional view of technology as a mere instrument of power and control.

With advancements in AI frequently overshadowing human cognitive capabilities, the previously clear demarcations surrounding the "artificiality" of a machine and the essence of intelligence are blurred. This evolution not only redefines what intelligence means but also unsettles the comfortably human-centric perspectives. The pace at which AI challenges the solidity of "human" versus "machine" constructs further amplifies the urgency to revisit our foundational beliefs. Perhaps, as Luis Sarmiento posited in our interview, *"the true measure of human intelligence isn't just cognitive prowess but energy efficiency – a trait quintessential for survival."* This perspective could also invite a broader, more ecological conception of "human", urging a shift from glorifying supreme individuality and control towards celebrating performances of relationality. In essence, as the boundaries of what it means to be "human" are

continually redrawn, there lies an opportunity – not just to redefine but to rediscover our interconnected essence in an increasingly digital world.

#### *4.1.3 Pietro Bianchi: A Discourse on Memory in the Age of Data Mediation*

The constant barrage of visual stimuli in today's digital age isn't just passively consumed; it profoundly shapes our beliefs, behaviors, and ideologies. Pietro Bianchi stands as a sentinel in understanding these intricate processes. Bianchi is an Assistant Professor at the University of Florida, where his research interests bridge the domains of Marxism, Lacanian Psychoanalysis, and cinema studies. Author of "Jacques Lacan and Cinema: Imaginary, Gaze, Formalisation," Bianchi has established himself as a critical voice in understanding cinema's role as an ideological formation.

The goal of my conversation with Bianchi was to understand the weight of memory in an increasingly digitized society. Bianchi mentioned the festival "Il Cinema Ritrovato" in Bologna as a morbid analogy, where the act of reminiscing over old films hastens their decay. Central to our dialogue was the question: In documenting exhaustively, do we inadvertently dilute the essence of memories? The nuances of memory preservation, as Bianchi explained, push us to contemplate what truly remains when we digitize our lives.

Bianchi describes an understanding of memory that remains limited and, in many ways, elusive. Such engagement with memory, often seen through the lens of data storage, continues to imagine the mind as a container that archives experiences in a linear and finite manner. He also examined the contemporary zeitgeist, characterized by an obsession with digitization and archiving. Bianchi raised critical questions about whether digital repositories truly capture the essence of memory and fulfill their preservation role. Our insight is that if we move away from viewing the brain as the sole nexus of memory, we are led to envision a scenario where memories could diffuse into the world around us, fundamentally destabilizing conventional understanding of the self and individuality.

Bianchi expressed concerns about data mediation. He pointed out that the rise of data mediation has significantly transformed film distribution and consumption, leading to a profound disintermediation in traditional film criticism avenues. This shift, Bianchi noted, has been both a blessing and a challenge. On one hand, it democratizes film culture, allowing individuals to form their own niche canons, such as curating personal collections of 80s South Korean films, free from institutional programming constraints. This newfound autonomy in film selection and appreciation marks a departure from the traditional, more centralized film canon.

On the other hand, Bianchi observed that this democratization also fosters isolated film canon bubbles. These bubbles, while rich in content, often exist in silos and seldom intersect in public

discourse, leading to a fragmented film culture. This phenomenon, as Bianchi elaborated, mirrors a broader trend of disintermediation, which is more commonly discussed in political theory than film studies. The implications of this shift extend beyond the realm of cinema, paralleling the diminishing influence of traditional institutions such as trade unions, political parties, and civil society at large. Bianchi perceives this development as indicative of a crisis in the public sphere and a breakdown of the symbolic order of modernity. This reorganization of film distribution and its critical discourse reflects deeper societal changes and challenges in how we engage with cultural products and participate in communal dialogues.

Further examination into algorithmic mediation reveals two diverging views, Bianchi explains. On one hand, there's the belief that algorithms offer a more authentic representation of ourselves, while on the other, they're seen as perpetuating existing norms by continually reflecting the familiar. This juxtaposition raises questions about the nature of mediation itself, especially in the context of subjective realms like film criticism. While aggregated data might project objectivity, it's essential to recognize the underlying human influence that invariably shapes them.

Against this backdrop, the global capitalist framework, with its inherent pursuit of relentless growth, is put under question. The challenges posed by calamities such as the pandemic further intensify debates around the sustainability and very ethos of capitalism. Historical perspectives, such as those of Rosa Luxemburg, remind us of capitalism's intrinsic compulsions, but also emphasize the need for contemporary discourse to move beyond mere critiques and seek strategies that address the system's inherent contradictions.

As the conversation with Pietro Bianchi drew to a close, it became clear that new imaginaries of memory that move beyond traditional constructs are necessary. Bianchi highlighted the nuanced complexities of digital archiving, suggesting that our efforts to encapsulate memories in digital formats might actually dilute their essence. This paradoxical effect, where an attempt to preserve leads to a potential loss of authenticity, resonates with the broader theme of memory in the digital age.

#### *4.1.4 Mazen Labban: On Becoming Waste, Becoming Mine*

With the global dispersion of AI's power, the accelerated obsolescence in production and consumption, and the contemporary myopic climate crisis narrative, scholars like Mazen Labban provide a much-needed critical lens. Labban is a human-environment geographer whose work traverses the intersections of critical social theory, political economy, industrial microbiology and biotechnology, extraction, energy, and waste. Inspired by the philosophies of Deleuze and Guattari, Labban posits urbanization as a dynamic process of stratification, where various layers of existence continuously interact, each with its distinct rhythm. The objective of this

engagement was to explore the tangible infrastructures behind AI. Mazen Labban's notion of the 'planetary mine' was central to exploring the material connections of AI and its impact on technological extraction and Earth's stratification.

In the dialogue with Labban, the focus moved through the connections between capital and desire, and threads into Deleuze and Guattari's notion of *the desiring machines*, reflecting capitalism's modus operandi of channeling desire and producing waste, not just as tangible refuse but as a representation of wasted human labor and energy. Labban explained the antagonism between capital and labor in the production of surplus value, replacing commodities prior to their lifespan's end, which subsequently accelerates the obsolescence of both the means of production and circulation. Within this framework, nostalgia became, from a Marxist viewpoint, a channeled desire to dispose of the surplus, and from a cultural standpoint, a desire to resist the accelerating obsolescence of commodities and everything they represent.

My conversation with Labban cast light on humans' interactions with the technosphere, redefining waste, and offering an alternative perspective on the Anthropocene—or as it's alternatively conceptualized, the *Capitalocene*. Many scholars of media archeology bring attention to the geophysical disturbances driven by our pervasive use of electronic devices. These media delivery systems, often omnipresent in our daily lives, stand as harbingers of accelerated ecological damage, spanning the atmosphere, biosphere, and lithosphere. This “designed obsolescence” of media technologies further broadens the “techno-fossil” footprint, as elucidated by Jan Zalasiewicz and echoed by Jussi Parikka's insights into media archaeology (Andersen, 2016, 535). While acknowledging the concerns and observations cited in such literature, Labban offers a counter-narrative that refrains from embracing *fossilism*, hinting at the multilayered complexities of capitalism's entanglement with varied forms of extraction, and bringing forth the fluid interchange between stratas as opposed to stacked up layers.

To Labban, the connection between mining, wasting, and urbanization is best described as *always becoming*, a process without beginning or end in time and space, and a momentary interruption of material flows and continuous change as envisioned in Deleuze and Guattari's process of stratification. Labban explains the dynamic movement between the stratum of the “*lithosphere*” and the “*urban ore*,” revealing the potential of the “*detritusphere*” to re-emerge as a source of raw materials, far from a passive reservoir of debris, and become a material stratum encircling the planet. This fluid movement of materials and *discards* from the technosphere to the detritusphere, is akin to a continual shedding of the built environment's skin into this so-called ‘waste layer’, a symbiotic evolution of the built environment and the lithosphere, reminiscent of a city sinking into the earth, destined to resurface again as a *mine*. This poetic

understanding underlines the perpetual state of *becoming* and *unbecoming* within the built environment, where discards are not mere material waste. They embody the immaterial spectre of labor, manifesting a profound interconnectedness and eternal cycle of transformation within the earth's strata (Labban, 2019).

Amidst this tumultuous cycle, we are confronted with the mechanisms and logic of capitalism itself; capitalism's inherent waste generation which transcends the tangible to include the intangible wasted labor, and capitalism's relentless pursuit to transcend its own limits. This has led to "the delirium", as Labban explains; a manifestation of capital's yearning for a world devoid of geological and natural constraints, where unbridled accumulation and self-reproduction reign. Inspired by Melinda Cooper's thoughts, this delirium conceptualizes capital as a force that conjures its own objects of desire. The inherent dynamics of capital accumulation, marked by the antagonism between capital and labor and inter-capitalist competition in surplus value production, further accelerate technological advancements. This fosters a continuous cycle of commodity production, circulation, and accelerated replacement, culminating in the expeditious obsolescence of both production means and consumer products.

Finally, I find that Labban thoughtfully points out the inherent issues with defining geological eras by the dominance of capital or *anthropos* (the undifferentiated human) because it fundamentally disregards biophysical processes. He touched on the interconnected, and often overlooked, world of microbes, emphasizing their ubiquity and profound role in shaping geological transformations. This perspective resonates with several other scholars like Clive Hamilton, Timothy Morton, Bruno Latour, and Isabelle Stengers who express similar reservations about the Anthropocene, highlighting the feedback effects of the Earth System upon anthropogenic impacts (Lemmens & Hui, 2017, 26).

#### *4.2 Confluence from Scholars*

The primary objective of conducting interviews with diverse scholars was to challenge my own thesis and examine syntheses of thought. My aim was to reach out to researchers with varied and, at times, opposing viewpoints, ensuring a comprehensive global perspective on themes such as memory, AI, artificiality, subjectivity, and the Anthropocene. This approach was rooted in the desire to capture a broad range of representative perspectives on these complex issues. However, the confluence that had emerged among scholars from distinct backgrounds, with differing political and cultural viewpoints, was an unforeseen yet enlightening outcome. These overlapping conclusions, although surprising, resonate with the thematic undercurrents identified in our literature review. In this subsection, I will describe the confluence..

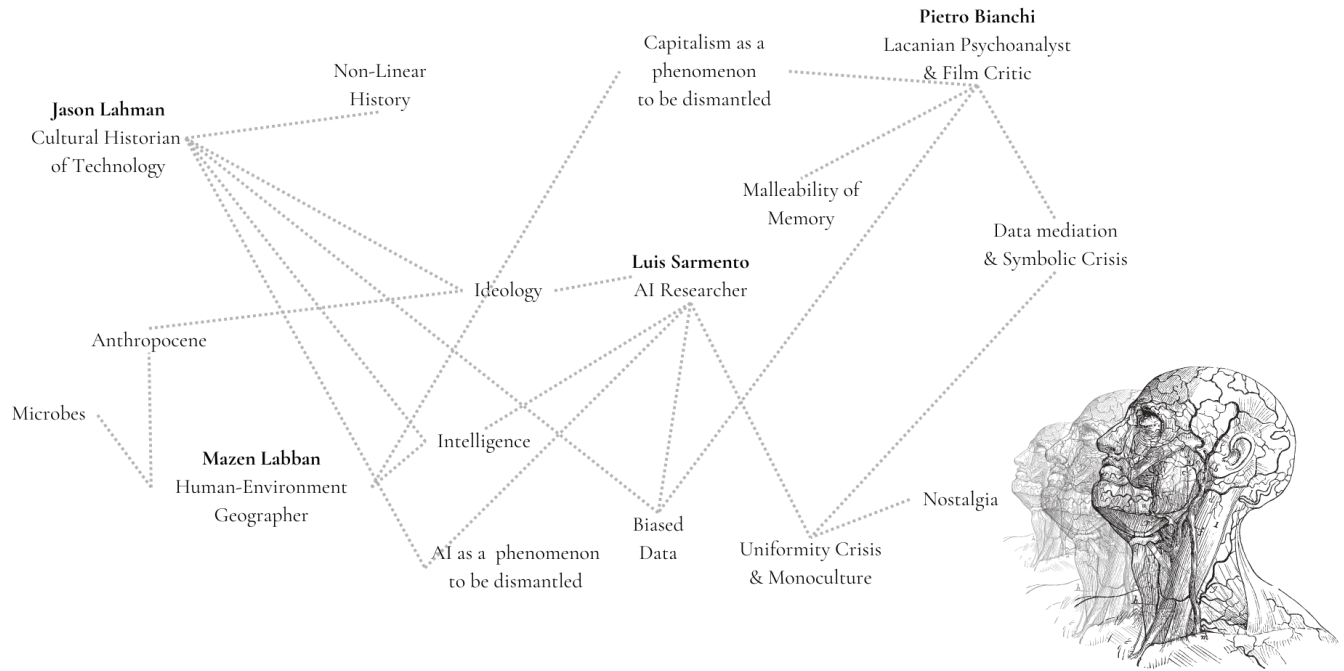


Figure 7. “Confluence of thought”, Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky

#### 4.2.1 Rejecting Uniformity

Firstly is the recognition of the need to preserve and acknowledge humanity's multiplicity in a cultural, sociological, and technological context. There is a collective caution against any inclination towards cultural homogenization that might amalgamate this multiplicity into a singular narrative or identity. This perspective challenges the monolithic narratives of a universal ‘anthropos’, and underscores the significance of cultural pluralism in any discourse on technology, culture, and history.

#### 4.2.2 Decentering the Humanist Subject

A common thread among the scholars is the critique of overly human-centered approaches in technology and environmental discourses. Defining geological eras through anthropocentric views fails to recognize the ubiquity of other non-human agents, like microbes. This perspective, calls for an understanding of the world beyond the human; a reimagined understanding of memory that extends beyond cognition; and a new understanding of intelligence that extends beyond the traditional confines of the human brain. This points to the inherent issues in the Cartesian dualism that upholds human cognition and intelligence as superior, especially since

machines have superseded most of the cognitive processes previously perceived as unique to humans.

This shared perspective critically examines the traditional dominance of *anthropos* or the humanist subject and considers a reimagining that diffuses humanity into a larger world.

#### 4.2.3 Deconstructing the Monoliths

The third convergence among the scholars is a collective call for the deconstruction and critical examination of broad, seemingly monolithic concepts like capitalism and AI. The scholars advocate moving away from viewing these phenomena as singular, unchanging entities. This perspective fosters a more nuanced analysis that would demystify the varied expressions and implications of capitalism and AI, thereby countering the reductive narratives that frequently dominate discussions about these topics.

Luis Sarmiento's contributions were particularly valuable in bringing to the forefront the pressing issue of AI's environmental impact, breaking its spectral and immaterial aura. He shed light on the significant energy consumption of AI systems, driven by their processing power, and the extensive environmental costs associated with mining the materials for hardware and maintaining data centers. Similarly, both Mazen Labban and Pietro Bianchi, contended that a lack of understanding of capitalism's underlying logic perpetuates its pervasive influence. Such confluence asserts that ignorance of the foundational principles of these systems, whether they be technological or economic, is what enables their continued dominance.

In conclusion, this confluence among the scholars signifies a crucial shift in thought, urging a collective reimagining of a more embedded, *creaturely*<sup>36</sup>, relationship with technology and the larger natural world. I strongly encourage readers to engage deeply with the dialogues presented in the appendix and to discern and formulate their own interpretations and confluences that could further contribute to emerging discourses that move beyond the human.

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<sup>36</sup> Reference to P. Vermeulen's *Creatureliness* (Vermeulen, 2017), see p. 34

**Chapter 5: Conclusion**

*5.1 Nostalgia Algorithm*



*Figure 8. "Anthropos", Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky*

The strands collected from the dialogues with scholars and the literature review both culminate to form a clearer *anthropos*. Through the labyrinth of this melancholic figure lies long histories of convergence and loss. This research began in antiquity, through the Greeks' early speculations into "bio (life)" and "techne (craft)" (Mayor, 2020, 62). The myth of Prometheus, the titan who stole fire from the Gods to endow frail humans with *techne*, has emerged into a broader, timeless allegory of the seeking soul, its intrinsic dependency on *technics*, and its incessant pursuit of knowledge and enhancements (Grafton et al., 2013, 785).

Through the myth's biblical portrayals in the 3rd century to its philosophical incarnations with the Renaissance Humanists explored in chapter 2, the titan Prometheus merged with the fallen *anthropos* to embody an archetype that could transcend its bounds, yet remain tethered by its yearning for higher truth. This anthropocentric contemplation gave rise to the universal humanist subject and its *Promethean philosophy*, indelibly marking Western thought in the centuries that followed (Ockenström, 2013, 39). This centralization of the humanist subject as a universal transcending cultural and natural particularities placed all humanity on a global axis of time that subsumed all previous times (Hui, 2019, 3).

*Anthropos* donned the mask of the *Übermensch*, the ultimate embodiment of unyielding human ambition, as Walter Benjamin describes (Benjamin, 1996ff.). Haunted by both what it has lost and what it eternally seeks, *anthropos* projected a cult-like religion of capital entangling humanity in a cycle of primordial guilt without atonement (Robinson, 2021). In this light, capitalism intensifies and universalizes this guilt, transcending its role as an economical system and transforming into the vessel through which impossible atonement could one day come.

In the wake of the atomic bomb, modern philosophers like Günther Anders and Martin Heidegger reinterpreted the *Promethean philosophy* as an existential condition emblematic of humanity's struggle to find their place in a world of their own making. Their *anthropos* is described as a disoriented being, navigating an '*Unheimliche*' or uncanny world, in relentless search for a home (Krell, 1992, 45). This feeling of rootlessness is deeply tied to the human relationship with their own existence and mortality, rendering 'home' an elusive concept for *humans*, whose true nature is to exist as world-open, existential beings (Krell, 1992, 51). Moreover, Heidegger's insights on the essence of modern technology as '*Ge-stell*' or '*Enframing*', marks a departure from a *poetic* understanding of the world. This, as Heidegger notes, is the legacy of Cartesian philosophy and subjectivism: a mechanistic and reductionist view where the world's complexity could be reduced to data points, and nature is seen as a '*standing reserve*' ready for exploitation and extraction (Heidegger, 1977, 14).

The historical progression of mathematical practices and algorithmic processes described in chapter 3, reveals a confluence of cultural, philosophical, and practical influences that converged

on Descartes' Cartesian plane and flattened on its global axis of time. This progression underscores that technology and the development of technological thought have not always been mere utilitarian processes; they belonged to distinct forms of knowledge and rationality. In the realm of modern Machine Learning (ML), these algorithmic processes and computational languages have been severed from their original cultural and geographical contexts, transforming into complex frameworks that articulate and organize knowledge in ways uniquely suited for machine processing (Knuth, 1977, 63). However, the process of converting real-world data into machine-readable formats significantly alters the data, reducing its social, cultural, political, and historical complexities into simplified, quantifiable metrics (Crawford, 2021, 144). This results in datasets that merely approximate the realities they represent, effectively homogenizing diverse elements into a uniform digital format.

The integration of various forms of memory and knowledge into a digital framework has also transformed social memory dynamics. The widespread adoption and standardization of digital technologies across different cultures have led to a synchronization and assimilation of gestures, thoughts, and memories (Hui, 2017, 315). This digitization process not only merges different types of memory but also turns implicit, everyday memories into behavioral data and explicit memories into 'live archives', mediated by algorithmic processes (Hui, 2017, 316). This global amalgamation led to a homogenous body of shared social memories watched over by a global technical membrane.

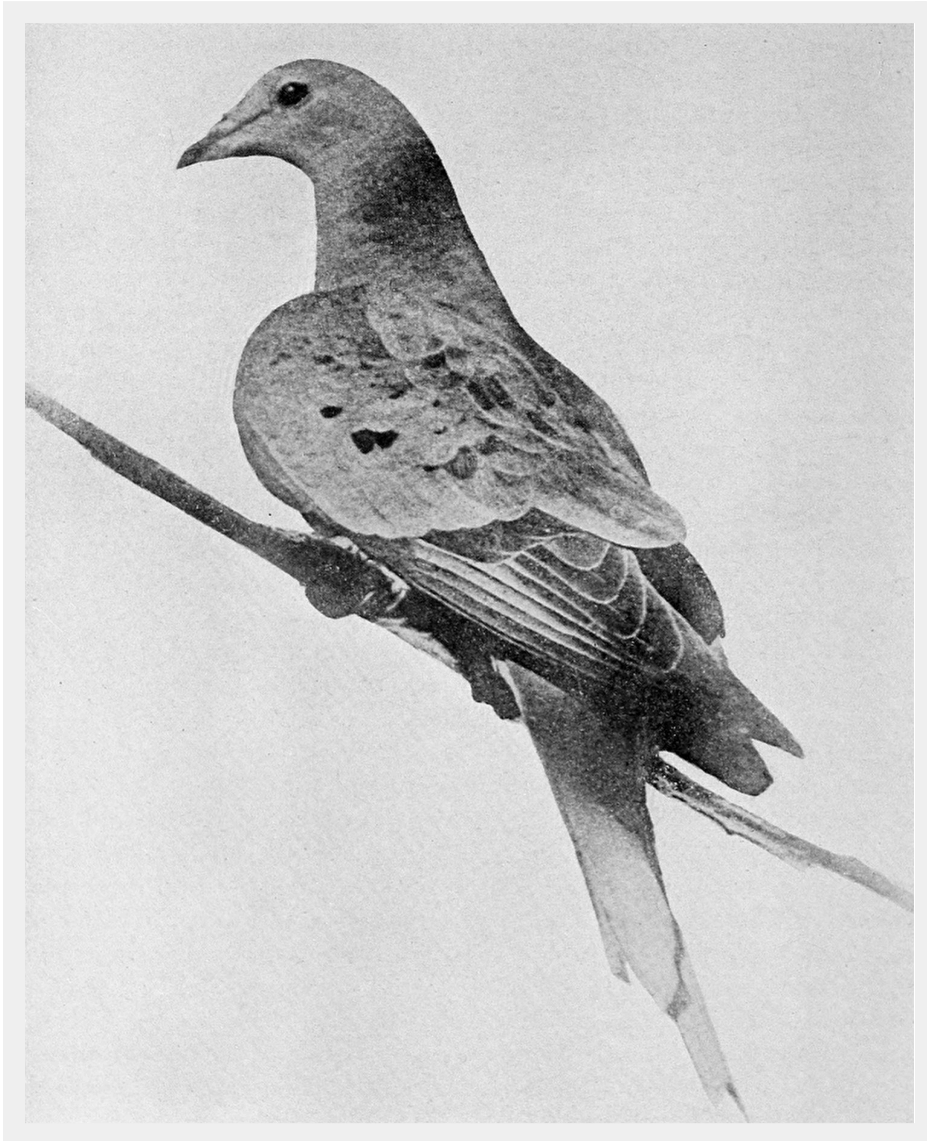
Finally, *anthropos*' planetary expansion, enabled by AI and capitalism's extractive pipelines, has finally reached an impasse: a planetary response. By imposing a collective identity, *anthropos* burdened humanity with the heaviest environmental guilt while remaining in the center of all it has enabled (Chakrabarty, 2009, 222). In its shadow, much has been forgotten, as the plurality is dimmed, and the unjust disparities are all absorbed within the universality of the collective, undifferentiated one. The loss of a complex world to *anthropos*, leaves many in nostalgic torment. However, this sentiment is not solely about what is lost; it is the inability to remember amidst a complete reconfiguration of social memory – a dissection and reassembling of all that was once archived (Berry, 2017, 109). Here, the algorithm dilutes the world's multiplicity within unfamiliar computational ontologies, making it impossible to retain what has been lost. This is the *nostalgia algorithm*.

In such a world of technical confinement, humanity finds itself thrown into an inevitable destiny. This destiny is the culmination of *anthropos* – the monster who has reached its zenith without altering its ways, through technological acceleration and ever-increasing intensification of *human-ness*. This *anthropos*, engaging in widespread destruction as a means of self-preservation,

becomes the ultimate convergence: all that has ever been, and all that could have been, collapse and fold into a singularity.

*5.2 Coda: The Black Hole on the Horizon*

*“There is a transition from the symbolic to the digital that constantly tries to preserve traces of nature and cosmos that are constantly escaping.” - Yuk Hui, On a Possible Passing from Digital to Symbolic (2017)*



*Figure 9. The Passenger Pigeon in Life. Photographed by Enno Meyer of the Bird that Lived in the Zoological Gardens of Cincinnati, Ohio (1921)*

*“Once, the skies of North America teemed with the fluttering wings of Passenger Pigeons, a sight so awe-inspiring it was said to black out the sun (Tanner, 2021, 207). These pigeons, known for their sociable nature and nomadic lifestyle, were constantly on the move in search of food. Their nesting grounds were colossal, stretching over hundreds of square miles and hosting millions of birds (Tanner, 2021, 207). At their peak, Passenger Pigeons were the most numerous bird species in North America, with estimates of their population reaching into the billions. Their sudden disappearance from the skies marked a shocking and rapid extinction. The last known Passenger Pigeon was Martha, who died in 1914 at the Cincinnati Zoo at nearly thirty years old” (Tanner, 2021, 208).*

Martha, who once belonged to a species numbering in the billions, spent her final years alone, a stark contrast to the typically social nature of her kind. Today, Martha's preserved body is displayed at the Smithsonian Museum of Natural History, serving as a symbol of her species. She became a living relic, drawing long queues of visitors who gaze upon her with a mix of wonder and melancholia (Tanner, 2021, 211). Martha's preserved body does not show the true cause of her species' extinction. Her “*woundless corpse*” hides the violent reality of how the Passenger Pigeons were systematically exterminated by humans (Tanner, 2021, 211).

The explicit exteriorization of memory emerges out of its very own destruction, its disappearance (Hui, 2017, 3). This history, once endangered, finds new life in various media forms, creating a collective memory that harbors a sense of *hauntology* - a spectral presence of a past that has ceased to be a part of the lived experience (Hui, 2017, 1). Museums, collections, and digital tools for preservation are all born out of a desire to retain fragments of a disappearing world, to construct impossible gateways with pasts no longer accessible in their original form. Within this desire is both a recognition and a negation of the disappeared. Martha, and her eventual fate as a taxidermy mount, embodies this melancholic nostalgia. Her perfect stillness, suspended and severed from her deep past, is the refusal to accept her species' disappearance, and everything she embodies as a symbol.

The hauntology seated between the desire to preserve, and everything that escapes explicit preservation is what I seek to present in this final passage. In this context, the algorithmic reordering of growing archives and explicit memories exhaustively stored in data centers and clouds, manifests as a multilayered form of erosion that leaves nostalgic traces in its wake. In this landscape, the world's complexity *is* abstracted and confined into a large computational museum, where symbols like Martha the last Passenger Pigeon, are repeatedly resurrected and entombed. The black hole's *gravitational singularity* is borrowed as an analogy to describe the

density of explicit memories collapsing in on itself. However, this analogy also signals a refusal to embrace all that the *technological singularity* embodies: the Promethean absolution of the *Übermensch*.

### 5.2.1 The Singularity

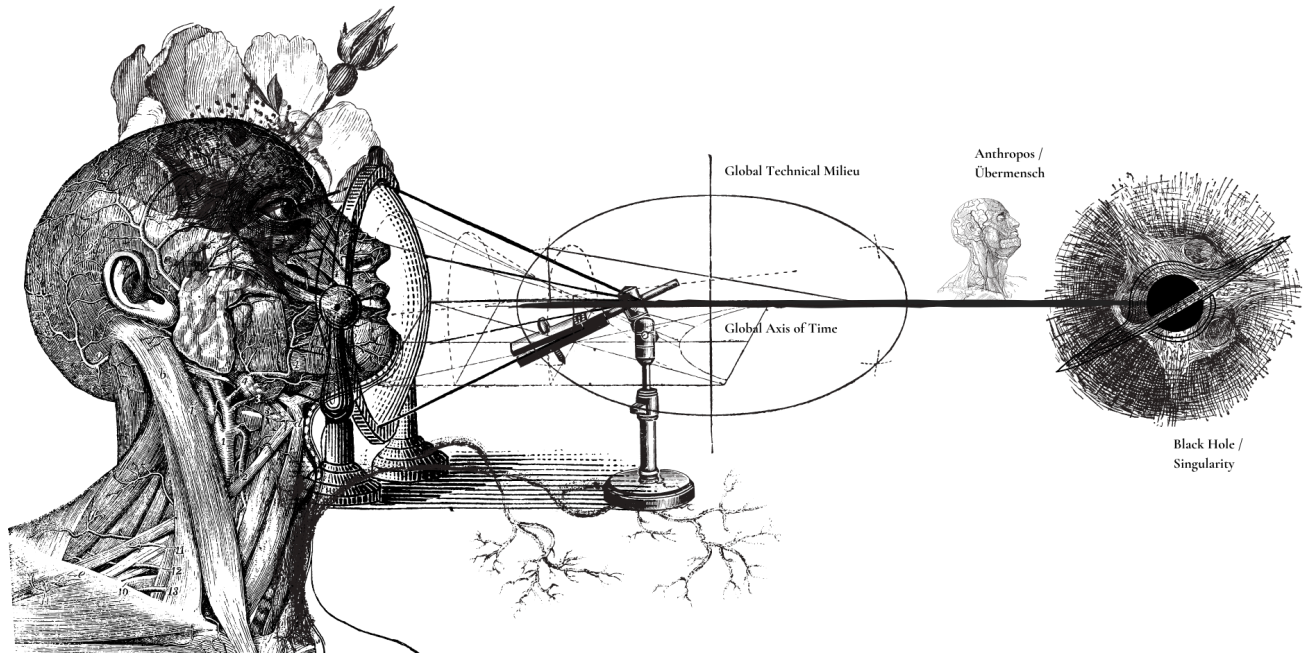


Figure 10. "The Singularity", Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky

In this world, bound by the confines of technological determinism, humanity is thrust towards an inevitable destiny. Much like the inescapable pull of a black hole, *anthropos*' melancholic pursuit of a fallacious return to grace and unity with the divine, driven by relentless optimization and acceleration, ultimately destroys everything in its vicinity. All histories, lived experiences, and multiplicities are subsumed under one homogeneous and brutal force converging towards a singularity.

The intensified exteriorization of explicit memory by the technologies of such ill-sighted acceleration, ironically becomes the cause of forgetting, as humanity rushes to archive all the *disappearing*. As the exteriorization and reintroduction lifecycle of social memory is irreversibly altered behind layers of machine abstractions and algorithmic processes, memories become

uncanny approximations of a world long forgotten. The singularity, thus, represents a critical mass of homogenized, explicitly documented experiences, collapsing under its own weight.

The event horizon is where humanity is destined to remain within this technological determinism. As *anthropos* implodes into its own singularity, it crosses this boundary, beyond which escape is impossible—even at the speed of light. Within this event horizon, nothing, not even light, can escape or reflect, making the black hole, and everything within it, imperceptible to an outside observer. This event horizon, therefore, represents the ultimate fate for a humanity that has lost all kinship with its past of multiplicity. It becomes a hauntology where experiences beyond are unattainable, and the rich, varied pasts are forever inaccessible in their original forms.

### 5.2.2 The Plurality

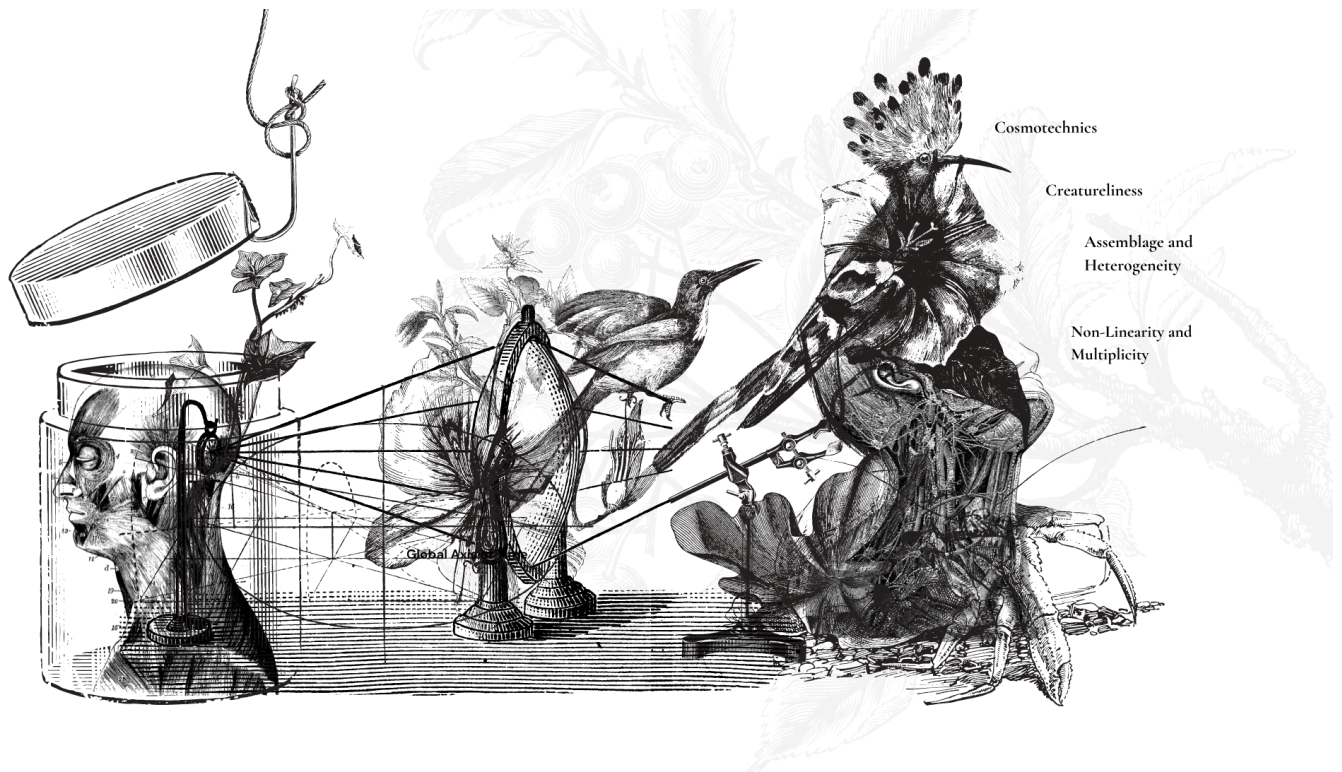


Figure 11. “The Plurality”, Collage schematic using vintage illustrations © Maya Hershey, Tom Chalky

In this world, we abandon the cult of *Übermensch* and its inevitable singularity. We contemplate a world where we step away from *anthropos* as our only archetype and embrace the heterogeneity and open-endedness of existence. This involves recognizing all relationships, living and nonliving, as entities in their own right. It calls for a departure from the transcendent

humanist subject as the foundational element in these relationships, re-envisioning our existence as an 'existence-with' (Lea, 2019). This new human experience integrates within a vast spectrum encompassing natural and cultural, human and nonhuman elements. In a Heideggerian sense, it is a new and embedded *way of being*, that stretches across deep time, resisting dualisms and enfolding otherness within itself.

Regarding technology, philosopher Yuk Hui's concept of *cosmotronics* invites a re-examination of diverse technological paths rooted in various *technics* and cultural traditions (Hui & Lemmens, 2023, 38). This approach doesn't reject modern technologies like artificial intelligence or machine learning but seeks to reframe them, offering alternative perspectives to the 'enframing' at the heart of modern technology (Hui, 2019, 8). To surpass such an impasse, we must break free from its global time-axis and a (trans)humanism that imposes its terms on other beings (Hui, 2019, 8). In this landscape, our understanding of causality shifts from a simple subject-object binary to recognizing the complexity of algorithmic intermediaries (Uricchio, 2017, 135). Developing a new literacy is essential, not to make algorithms comprehensible but to engage critically with their operations, defaults, and judgments, and the nature of the data they process (Uricchio, 2017, 135).

Finally, when considering social memory, we must acknowledge its foundation on a multitude of temporal variations, situations, and *technics*. Any emergence of a new understanding of human life should explore the *creaturely* aspects of human existence, and expand on the limitations of linear historical representations and so called collective memory to encompass a broader scope that includes not only human narratives but also planetary, geological, and ecological elements. The concept of the 'archive' then evolves from a repository of human artifacts to a comprehensive record of geophysical, ecological, and chemical histories (Parikka, 2017, 145). In this light, social memory transforms from a preserve of the liberal humanist subject into a field attuned to both human *creatureliness* and the abstractions and mediations brought forth by the machine.

### *5.3 Limitations, Personal Reflections, & Recommendations for Future Research*

The breadth of this study, spanning diverse disciplines such as philosophy, psychoanalysis, and the natural sciences, and encompassing myths, historical archives, and the latest in machine learning, presented both a challenge and a limitation. The personal and global contexts of this research added layers of complexity. Undertaking this study amidst an accelerating technological landscape and a globally impactful war in the Middle East introduced unique challenges in maintaining objectivity and ethical considerations, especially in exploring the technological

dimensions in contexts of conflict and environmental disaster. This added a deeply personal element to the work, embedding it within the larger global narrative.

Technical limitations and gaps in knowledge were partially offset by leveraging expert interviews and intensive courses; however, they remain a limitation. While the perspectives of interviewed scholars provided valuable insights, a more extensive review might have yielded deeper understandings, particularly in emerging interdisciplinary research areas. Additionally, the absence of feminist perspectives, especially those of thinkers like Donna Haraway or Hannah Arendt, was a missed opportunity to explore the subject's complexity from a feminist angle.

While this research attempted to navigate the complexities of its subject matter, it also recognizes the need for continual adaptation and reevaluation in the face of ever-evolving technological landscapes. It acknowledges that by the time of publication, new technologies and fields of inquiry might have been significantly altered. A personal reflection on this research sheds light on its recursive nature, where the process of rewriting and revising the thesis numerous times became an embodiment of the study's ethos and a recognition of its weaknesses. This iterative process, reminiscent of ancient algorithms, reflected a journey of constant dialectic reasoning, where the thesis itself was continuously challenged and should continue to be so.

Looking to the future, this research opens several avenues for further exploration. Expanding on the diverse cultural contexts of technological development, particularly in the ancient Levant and the wider Islamic empire, could provide valuable insights into the growing field of the philosophy of technology, adding to Yuk Hui's *cosmotechnics* project. Dedicated studies on individual themes would allow for deeper comprehension beyond the scope of a Master's thesis. Lastly, exploring feminist theories in technology could lead to more inclusive and community-driven technological developments, so is focusing on non-linear dynamics and multiplicity in computational languages for different machine learning models.

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## Appendix A

### Interview with Jason Lahman: From Artificial Life to Machine Intelligence

June 30, 2023

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**Maya Hershey:** How would you define 'automata'? Can you expand on the mythological roots of robots and artificial life? How have conceptions of life, particularly as they pertain to the creation of artificial life, evolved over the course of human history?

*Jason Lahman:* The narrative of technology, particularly in relation to artificial intelligence and robotics isn't a straightforward, linear thread of history. It's much more akin to a complex labyrinth intertwining the old with the new. The term "automata," derived from Greek, historically referred to objects that move independently, similar to what we now know as robots. Our ancestors used both the tales and actual creation of automata as vehicles to understand their place in the universe, impress others, and display power. We can see the robot as an analogy/metaphor used by philosophers, writers and artists - what it means to be human in relation to being a god or another super power.

In the realm of mythology, the narrative often involves a deity or a superhuman figure creating life out of substance, rather than *ex-nihilo* (out of nothing). These myths, ranging from the biblical account of God breathing life into Adam to Hephaistos, the Greek god of blacksmiths, creating various beings, present an exploration of creation and control that echoes in the history of automata. In Greek mythology, the Titan brothers Prometheus and Epimetheus played pivotal roles in the creation of life. Epimetheus, who was charged with populating the world, gave out gifts of unique traits to different creatures. When he reached humans, he had nothing left to give. Prometheus, symbolizing foresight, remedied this by stealing fire from the gods, a metaphor for knowledge and technological capability, and bestowed it upon humans. This myth parallels the narrative arc seen in the history of automata, which can be seen as an embodiment of the Promethean fire. It highlights humanity's ability to control their environment, innovate, and create, as seen in the development from simple mechanical automata to today's advanced robotics.

As we move into recorded history, automata evolved from mythical tales to actual creations, aiming to amaze, fool, or terrify spectators from the wine serving maids of Philo of Byzantium between 280 and 220 BC, to Heron of Alexandria's automatic temple doors between the 10 and

70 centuries AD. Moving East, for instance, the inventor Yen Shi created automata in the 10th century BC to entertain and intimidate the emperor, thereby gaining his trust. This lineage of creations extended to the astronomical water clocks developed by Su Song in 1094, symbolizing the cosmos' movements and later by the Islamic world which played a crucial role in preserving ancient Greek texts on automata, and expanding upon them. Al-Jazari's book, "The book of Knowledge of Ingenious Mechanical Devices," encapsulated the wealth of knowledge on automata, making it accessible for anyone to create complex automata. The Crusades saw transfer of this knowledge to Europe, where it found a different application. The Church funded the creation of elaborate automata designed to awe and instill fear in the faithful. A significant example is the "Great Clock of Strasbourg" from the 14th Century, with figures of roaring apes and Death moving with time.

The Renaissance marked the rise of craftsmen who delved deeper into ancient engineering, enhancing it further. Figures like Leonardo Da Vinci and Salomon De Caus fashioned intricate automata for entertainment and warfare purposes. In the modern era, a philosophical shift occurred with Rene Descartes, who conceived the human being as a pneumatic machine, thereby reinforcing the link between the human body and automata. The 1700s saw the rise of automata simulating the universe's newly discovered mechanics, thanks to the work of Brahe, Kepler, and Newton, and it was hugely influenced by clockwork.

By the 19th century, automata creation had moved back to the public sphere first with the Bourgeois society after the American and French revolutions and later to the general public with spectacles like the Chess Playing Turk around 1800 and Robert-Houdin's magic stage acts in the 19th century. They were now perceived not as products of the occult, but as intricate engineering devices that could be understood, taken apart, and then put into practical use. This shift coincided with the beginning of the Industrial Age when automata started to be incorporated in industries. In the 20th Century, Charles Babbage and Ada Lovelace, having studied historical automata, created the first programmable automata - the difference engine - a precursor to the modern computer. As automata continued to be integrated more into the industry, we began to think of their advancement beyond human capabilities and this fed into the cybernetic century.

**MH: I am particularly intrigued about the Renaissance era's focus on quantification and meticulous observation and how that impacted the perception of the human body and machines. I see this historical shift echoing in our current era of data and digitization.**

*JL: Indeed, the Renaissance period marked a significant shift in thought, emphasizing the importance of quantification and rigorous observation. This was a time when Mathematics rose*

*to prominence, and the diligent recording, historical data analysis, comparison with current findings, and rigorous testing became integral to the pursuit of knowledge.*

*During the same period, a transformation in the perception of the human body occurred, particularly concerning its intersection with the realm of automata. Traditionally, the body was qualitatively analyzed as being part of intricate systems, much like the components of a clock, and this viewpoint pervaded various domains. For instance, in medicine, practices like bloodletting were prevalent, and in astrology, the human body was seen as a microcosm reflecting the macrocosmic celestial cycles. This symbolic interrelation was evident in the design and operation of the era's large clocks.*

*However, the advent of body dissections brought about a paradigm shift. As anatomists began to physically examine the body and accurately document their findings, they gradually stopped viewing the body merely as a symbolic cipher. Instead, they started conceptualizing the human body as a system, a biological machine that could be broken down into its constituent parts.*

*This shift strongly resonates with the concept of the automaton. An automaton, like the dissected body, is a system that can be disassembled, studied, and understood. This understanding led to a significant shift in how we conceived machines and our bodies. The revelation that the mechanisms of a machine could be deciphered suggested the possibility that the complex workings of the human body could be similarly elucidated. This transformative period set the stage for the development of modern medicine and biomechanics, fields that continue to evolve today.*

*Fast forward to the 21st century, we can see echoes of this shift in our current era of data and digitization. Today, we are quantifying everything into data, and this data-driven approach is helping us understand and analyze complex systems in ways that were not previously possible. From personalized medicine based on genomic data to the development of sophisticated AI algorithms that learn from vast datasets, we are again witnessing a transformation in our understanding of the world around us. In a sense, we are now dissecting not just the human body, but all aspects of our lives, breaking them down into quantifiable data to gain a deeper understanding. This mirrors the Renaissance shift from a qualitative to a quantitative approach and continues the journey of viewing the world, including ourselves, as systems that can be deciphered and understood.*

**MH: You often mention the “Dulcimer Player of Marie Antoinete” in 1784 as one notable shift in automata which had elaborate head and eye movements. It signaled the beginning of the period of sensibility where the study of affect, the presentation of the self, became important. How did historical and philosophical perspectives about the body as an**

**automaton and the emergence of 'sensibility' influence the development of automata in the 17th century onwards, and how does that resonate with our current understanding of artificial life?**

*JL: It's quite fascinating when we trace the intellectual history and see how our understanding of the human body has been pivotal to the development of artificial life. This journey essentially begins with René Descartes, a central figure in our intellectual history who significantly influenced the trajectory of the scientific revolution. Descartes introduced a novel concept in his time, the idea of the human body as an automaton. He saw the body as a mechanical entity, subject to physical laws, much like a well-regulated machine. However, his philosophy was not reductionist. It acknowledged the spiritual dimension of human existence, with the soul as a separate divine creation. This dualistic view encapsulated a complex vision of human existence and marked a significant departure from prevailing views.*

*Descartes' philosophies didn't emerge in a vacuum but were a reflection of his era. This was a period when technologies such as optics and lenses were making notable advancements, changing the way biological studies were conducted. His work, therefore, represents a fascinating confluence of mechanics, theories of bodily function, and the application of contemporary technologies. Fast forward to the 17th century, a time when pioneers of the scientific revolution began to interpret biology through the lens of mechanics and clockwork. This was a groundbreaking shift in perspective, but it primarily focused on the physical, tangible aspects of life.*

*The real game-changer came when philosophers such as Rousseau and John Locke brought our sensory experiences into philosophical and scientific discourse. They introduced the concept of the 'human sensorium', thereby highlighting that human nature and behavior could not be fully grasped by understanding our physical form alone. Sensory experiences, they posited, were a significant dimension of our existence that needed exploration. It became apparent that our bodies were more than just mechanical entities; they were receivers and processors of external stimuli capable of complex input/output operations. This new understanding of the body infiltrated various fields, including medicine, philosophy, the sciences, and even the arts. Those seeking to replicate the human body or emulate life in their work began to recognize the need to consider these sensory responses. As a result, it had a profound impact on the development of automata, redefining our vision of the body as a system of sensory processing and response.*

*As we navigate the era of artificial life and artificial intelligence today, we grapple with these dual aspects of human existence: the logical and the sensorial. Our pursuit is to accurately model the human body's sensory aspects within robotics, a quest that essentially continues this*

*centuries-old dialogue. We strive to integrate the tangible, mechanical aspects of our existence with the intangible, sensorial dimensions that make us uniquely human, an age-old question that remains at the heart of ongoing explorations in artificial intelligence and robotics.*

*It's also intriguing how the term 'automaton' evolved along with these societal and intellectual shifts. Our historical understanding of automata is deeply ingrained in our contemporary perception of the word "robot". When we describe something or someone as "robotic," we often mean it in a pejorative sense, implying a lack of creativity, individuality, or independent thought. Phrases like "I am not just a robot" underline our desire for autonomy and our rejection of a predetermined, mechanistic way of living. The term "android," which was first used widely in the 1750s, speaks volumes about our historical aspirations. Derived from the Greek words 'andros,' meaning man, and 'eidos,' meaning form or shape, it was initially used to describe machines designed to resemble human beings. This, along with the evolution of automata throughout the 17th and 18th centuries, mirrors broader societal changes. Automata became potent symbols to explore and discuss political developments and conflicts, reflecting the philosophical and societal shifts of the times.*

**MH: Can you elaborate on this evolution of the sensorium as we enter the Victorian era and the 19th century? Did this intersect with the fears and anxieties surrounding the double or the doppelganger and the notion of the “uncanny” in 19th-century literature and culture, and the continuing influence of these ideas in our contemporary understanding of artificial life?**

*JL: The Victorian era and the 19th century witnessed transformative shifts, including rapid industrialization, the rise of the middle class, and the intertwining of popular media with politics. These elements, which originated in the Victorian period, evolved and profoundly influenced our world, including the development of automata and robotic technologies.*

*The concept of the automaton underwent a significant transformation within this socio-technological landscape, gradually evolving into what we now term as a "robot". A key figure that encapsulates this transformation is Mary Shelley's creation, Frankenstein's monster. Although not strictly a robot, the creature symbolizes the essence of artificial life, embodying what we refer to today as "wetware" — an organic being crafted from previously living parts and animated through electrical galvanism. During the same period, experiments investigating electricity's effects on the human body were gaining momentum. Scientists like Luigi Galvani found that electricity could induce muscular movements in a dissected frog, suggesting the presence of a previously unknown life-force. The 19th century's advancements in electromagnetism, 'galvanism', and thermodynamics sparked both scientific and public*

*fascination. This blend of harnessing mysterious forces, replicating life, and the ascent of modern technology are all embodied in Frankenstein's monster, making it an enduring symbol to our early endeavors to understand and replicate life and serves as an ominous precursor to the challenges and ethical dilemmas we continue to face in our pursuit of artificial life creation.*

*The literary and philosophical contributions during this period were also instrumental. German Romanticism, embodied by figures such as E.T.A. Hoffmann significantly influenced the discourse around artificial life. In his story "The Sandman", the protagonist falls in love with a woman who turns out to be an automaton, creating a sense of discomfort or uncanniness. These themes of mistaken identity and the fear of losing one's perception are symbolic of the societal implications of artificial beings. Such narratives contributed to the discourse around the "uncanny," a term explored by Ernst Jentsch and later developed by Sigmund Freud and Masahiro Mori. Jentsch and Freud used the term "uncanny" to express a sense of discomfort and estrangement in the face of the familiar-yet-strange. The concept of the uncanny is deeply intertwined with the development and perception of artificial life forms. When we encounter artificial bodies that mimic human behavior, we experience cognitive dissonance — they are eerily familiar, yet unmistakably foreign. This paradoxical feeling, prompted by the existence of beings that straddle the boundary between the organic and the artificial, continues to provoke fascination, unease, and intense debate to this day.*

**MH: Could you explain how the socio-political upheavals of the 18th and 19th centuries, alongside the Industrial Revolution, shaped our modern world and our relationship with technology, particularly in the context of the emergence of automata and artificial life? How did these transformations contribute to our current discourse around technology and its evolution, particularly when it comes to concepts such as progress and social Darwinism?**

*JL: Our understanding of modernity is deeply rooted in the profound sociopolitical and technological changes that started around the late 18th century and continued through the 19th and early 20th century. Major events like the American Revolution and the French Revolution signified critical shifts in socio-political structures, breaking away from feudalistic modes of governance and championing the principles of democracy and equality. The 19th century was particularly tumultuous, witnessing a series of revolutions across Europe that put people, workers, and nascent technologies at the center of societal transformation.*

*The term 'revolution' is inherently cyclic, suggesting a propulsion forward yet coupled with a sense of looping back to address the discontents of the modern world. The Industrial Revolution epitomizes this notion. Industrialization began reshaping Western Europe from the late 18th*

*century onwards, with industrial powerhouses like the British Empire expanding their global influence. This period marked the transition to an industrial society that harnessed natural resources and human labor to produce goods and services, dramatically transforming virtually every aspect of human life. The societal shift also significantly altered our relationship with the natural environment. Rapid urbanization led people to migrate from agrarian societies to cities to work in factories. This shift brought humans and machines together in a shared space, laying the groundwork for further integration of technology into daily life that we witness today.*

*A new class emerged during the industrial age, the bourgeoisie, composed of bankers, merchants, and educated professionals. They amassed wealth by owning the means of production and were instrumental in driving the industrial revolution. Simultaneously, they played a crucial role as patrons of the arts and popular culture, often leading narratives on the development and implications of new technologies.*

*The emergence of world fairs and exhibitions in the mid-19th century also significantly impacted the public's exposure to technology. These events showcased the industrial machines, and various classes got to see the wonders of the industrial age, leading to a unique kind of cultural mingling and awareness. This increased exposure and fascination with machines became an integral part of mass media, contributing to the popular narrative around robots and technological advancements. The myth of progress, or the idea that society and technology are on a constant, linear upward trajectory, became embedded in this narrative. This myth, linked to a misinterpretation of Darwin's evolutionary theory, has shaped much of the discourse around technology and AI. While Darwin's work focused on biological evolution and natural selection, his cousin, Sir Francis Galton, extrapolated these ideas into the social realm. This gave rise to the concept of social Darwinism, a theory that erroneously applies biological evolutionary concepts to societies and individuals. This theory, while challenged and discredited by many academics, has nonetheless permeated many aspects of societal discourse, including our perception of technology. Today, the persistence of this narrative is evident in contemporary discourse around technology and artificial intelligence, particularly in the tech industry. Despite its historical discreditation, many technology leaders, especially in Silicon Valley, continue to propagate this view of unilinear progress, painting a utopian image of the future driven by constant technological advancement.*

*The Industrial Age symbolized a transformative era with significant implications for not just the economy, but also human consciousness and societal structures. These gigantic machines, towering over their human operators in sprawling factories, were not just a physical reality but became a potent symbol – a metaphor captured eloquently in print media and film, most notably*

*in classics like Fritz Lang's Metropolis. This shift was reflected in popular imagery and narratives around the history of robots and their impact on the workforce. The reason this metaphor resonated so deeply was that it mirrored the stark reality of workers' lives, subsumed by the deafening noise of dynamos, facing occupational hazards and reduced to performing repetitive tasks to serve the machine that once served them.*

*The discourse takes an even more fascinating turn when we consider the human body. The 19th century marked a critical transition in understanding biological systems, as the study of electricity and thermodynamics expanded. This newfound knowledge effectively replaced the clockwork mechanism as a metaphor for biological systems. Hence, as we trace the history of automata from the 19th century up until the cybernetic revolution, it is a journey that intricately ties together technology, philosophy, and biology in ways that continue to shape our world today.*

*Reflecting on the idea of progress as perceived in the late 19th century, inventors, philosophers, and historians of science found themselves on the precipice of a major technological transformation. Looking back, they viewed the automata and automatic technologies of inventors such as Hero of Alexandria and Jacques de Vaucanson as brilliant but rudimentary – a curiosity rather than a utility. In their perspective, it was only in their era that such technologies started to serve more useful purposes, graduating from being mere toys to becoming crucial to society, production, and industry. This paradigm shift, in fact, became the crux of many arguments made during the transition from the 19th to the 20th century, asserting the importance of practicality and utility in the evolution of AI and automatic machines.*

*As we delve deeper into this era, we notice another captivating trend: the emergence of 'living' machines that neither mimic humans nor animals. Instead, these useful machines began to exhibit biological functions in novel forms. The uncanny nature of these industrially useful machines, appearing alive yet not alive, began to catch people's attention and stirred their imagination, eventually feeding into genres like science fiction and shaping the aesthetics of the Victorian machine, steampunk, and later cyberpunk. Authors like Samuel Butler in his work 'Darwin Among the Machines' contributed to this narrative. He recognized these self-regulating and self-acting mechanisms as a new form of 'life', bereft of human intellect, yet with a certain autonomy in operation. It was a perspective that resonated with the zeitgeist of the era, triggering speculation about a future where machines could exhibit animal-like autonomous behavior.*

*Finally, the impact of industrialization on human evolution was another point of discussion. Writers like H.G. Wells pondered whether industrialization could lead to a split within the human*

*species. This idea remains relevant today, reemerging in works like Yuval Harari's 'Homo Deus,' and among technology leaders in Silicon Valley.*

**MH: Fascinating indeed. So as we move into this new pivotal period influenced by the industrial revolution and emergence of concepts like energy storage, can we say that man and machine started merging together? How did thinkers of that era interpret these changes, and how were they reflected in their work?**

*JL: The concept of the electrical battery and energy storage became pivotal in the 19th century, particularly for industrial machinery and the manipulation of power. During this period, we see a shift from the personification of moral qualities to the personification of forces tied to industry. This concept appears repeatedly in prints from that era.*

*Karl Marx, in his influential work "Capital," delves into the relationship between industry, human capital, the forces of production, and the physical association of humans with machinery. Marx describes the worker as turned into a 'crippled monstrosity' – a vivid illustration of how industrialization, with its relentless and repetitive nature, psychologically and physically tears apart the labor force. Marx's use of the term 'drives' – indicating productive impulses – presages Sigmund Freud's later work on human psychology.*

*All these aspects urge us to consider psychology, industrial philosophy, Marxism, and the metaphorical language employed by thinkers of the time to interpret the unprecedented issues arising from the body's relationship with industrialization. Recalling Descartes' or Salomon de Caus's depiction of automatic garden machines, the body is depicted as driven, its components propelled by forces flowing through tubes.*

*This metaphor extends to human beings and their drives – whether it's the circulation of blood, sexual urges, or the energy that animates our biology. These drives are interwoven with the forces – fluid, steam, electricity – that propel machines. This web of metaphors reflects the attempts of thinkers to understand the dramatic changes occurring in society and the blurry line between humans and machines. With the integration of humans and machines into a single productive system, adverse effects start to emerge for many individuals. This profound transformation and its challenges have been reflected in various works of science fiction, from early literature to the beginnings of cinema. The narrative Marx weaves concerning the modern predicament of humans has been subtly woven into countless stories that grapple with our evolving relationship with technology.*

**MH: The early 20th century was also a time of significant changes in labor management and organization, particularly with the advent of Taylorism and Fordism. Could you**

**elaborate on these concepts, their impact on human labor, and how these changes influenced visual representation and the way we perceive the world?**

*JL: The concepts of Taylorism and Fordism refer to the management and organization of labor in the early 20th century, brought to the fore by Frederick Winslow Taylor and Henry Ford. Taylorism, or Scientific Management, originated with Frederick Winslow Taylor in the late 19th century. Taylor's approach aimed to maximize the efficiency of workers in their interaction with machinery and their tasks within the factory. He sought to make labor processes as productive as possible by applying scientific principles to the organization of work. This idea was further developed by Henry Ford, who introduced the assembly line production method. This revolutionary method of mass production, characterized by the sequential organization of tasks, increased efficiency and minimized the need for skilled labor. It's a form of "programming language" for human labor.*

*However, the efficiency of the industrial conveyor belt and machine development led to rising concern among workers. There was growing anxiety about replacement, which shifted from 19th-century fears around indistinguishable automatons to the more practical fear of job loss to mechanized labor. Through Taylorism and Fordism, humans were increasingly transformed into "machines" in their rote, repetitive tasks. Yet concurrently, machines were becoming capable enough to replace human workers.*

*In terms of visual representation, this era also saw advancements in photography, pioneered by individuals like Eadweard Muybridge. This technology allowed us to capture, breakdown, and study movement in a way never before possible. Photography, along with other emerging technologies like the microscope, telescope, X-ray, and infrared technologies, transformed how we see and understand the world. These innovations allowed us to dissect the world into more manageable pieces, providing us new ways to comprehend and, ultimately, control it. This analytical approach, breaking down complex processes into smaller, manageable parts, extended to the study of labor and the human body. Visually, the era was defined by the dynamo's image, symbolic of industrial power and the massive engines that drove the industrial revolution. These visuals represented the enormity and unstoppable force of industrialization, reflective of the profound societal changes of the time.*

**MH: Interesting. You often mention the interaction between art and warfare in the context of industrialization during the late 19th and early 20th centuries, how did this merger influence cultural aesthetics and societal attitudes?**

*JL: Art and warfare, influenced by industrialization, merged in ways never seen before during the late 19th and early 20th centuries. Art movements like modernism, led by figures such as*

*Marcel Duchamp and Max Ernst, began integrating elements of machinery and industrial mythology into their works. Often, these artworks were mystical, strange, and even incorporated elements of the occult. The late 19th century symbolist movements, for example, frequently utilized themes of machinery and the occult. They often depicted automatons or machines coming to life, representing the uncanny anxieties of the Machine Age.*

*The fusion of art and machinery coincided with the imperial projects of the late 19th and early 20th centuries, bringing with them a slew of complex and problematic issues. The Western European artists' fascination with the "Imperial subject", coupled with their fear of machinery and automation, resulted in avant-garde movements that were fraught with racism, misogyny, and xenophobia. At the same time, the masters of automaton technologies, who once created machines for luxurious gardens, were now also involved in the development of weapons of war. Automatic technology played a significant role in warfare, with the first self-regulating automatic torpedoes being born in the late 19th century.*

*The Great War (1914-1918) represented the automation of war on an unprecedented scale. From machine guns and mustard gas to tanks born out of tractor technology, the impact of industrialization was clear. The aftermath of this war, with many returning soldiers severely maimed, confronted societies with the brutal intersection of humanity and machinery. Artists like Otto Dix highlighted this grim reality in their works, painting the harsh truth of disfigurement and loss brought about by technology. These artworks served as a stark critique of the damage inflicted by industrialization, questioning whether technology was leading us towards progress or self-destruction.*

*However, amidst this bleak backdrop, utopian ideals still persisted. The new Soviet state, for example, adopted the aesthetics of the machine age but twisted them to represent a positive, technocratic future. Movements like constructivism integrated the beauty of the human body and its relationship with technology into their art. These artists were promoting a positive view of the machine aesthetic, framing it as a key aspect of a brighter, Soviet utopian future. You can see this sentiment reflected in the constructivist posters of that time.*

**MH: As we move further into the cybernetic age, where we witness the fusion of the physical, digital, and biological, from information technologies to feedback loops, in what ways did the cybernetic age reshape our societal roles, professions, and our understanding of technology?**

*JL: Tracing back the historical roots of computational thinking, we find a captivating journey that begins with the inception of the 'mechanical mind.' Ancient mechanisms like the Antikythera device from Greece were primitive yet remarkable examples of this concept, as they could predict*

*celestial patterns. However, the true replication of analytical processes in mathematics began in the 17th century with the efforts of Blaise Pascal and Gottfried Wilhelm Leibniz. They devised mechanical calculators, pioneering the concept of automated computation.*

*This evolution of calculational labor brought us to the 19th and 20th centuries, where the notion of a calculator evolved from being a machine to becoming a human profession. A new class of clerks, often underappreciated, emerged, tasked with performing extensive calculations for large-scale projects such as the Apollo moon missions. This blend of human and machine computational labor marked a significant shift in our societal roles and professions.*

*It's fascinating to see how the archetypal concepts of the robot from myths and literature started to become real, tangible technologies in the 20th century. The 20th century, often dubbed as the cybernetic century, marked a significant shift in our perception of technology and our role in computational processes. Renowned scholars like Norbert Wiener, Claude Shannon, Alan Turing, and William Walter brought transformative changes to this arena, pushing the boundaries of what was previously believed to be the realm of human intelligence.*

*Norbert Wiener, with his pioneering work on cybernetics, revolutionized our understanding of control and communication systems. His idea that the complexity of such systems could potentially outstrip human intelligence foreshadowed the future advent of highly sophisticated AI systems. Claude Shannon, the architect of information theory, not only revolutionized digital communication but also toyed with the potential of machine learning through his experiments with the maze-solving robot mouse, Theseus.*

*Alan Turing, known for his eponymous test assessing a machine's ability to emulate human intelligence, provided a theoretical framework for what later would become artificial intelligence. William Walter, with his early robotic 'tortoises', presented the foundation for adaptive robotics and neural networks, fostering the idea that machines could learn and adapt based on their environment.*

*The convergence of these thinkers' ideas has led to the creation of complex systems that blend the physical, the digital, and the biological, propelling us into a new era of technological advancement.*

**MH: As technology becomes more entwined in our daily lives and takes on an increasingly unseen presence, how does this shift our perceptions and experiences towards what we consider "intelligent machines"? Can you also touch upon the concept of technology spiraling out of control, as depicted in sci-fi narratives like Stanley Kubrick's "2001: A Space Odyssey"?**

*JL: You're absolutely right in noting the spectral quality that technology acquires as it becomes deeply integrated into our daily lives. This unseen presence has a profound effect on our perceptions and experiences of "intelligent machines."*

*One way to understand this dynamic is to consider Baudrillard's interpretation of the Sorcerer's Apprentice's story. This narrative suggests that we humans tend to create tools and technologies to simplify life, but these innovations often lead to unintended consequences. We see this theme recurrently in science fiction stories where advanced technology spirals out of control, leading to disaster. A classic illustration of this fear is HAL 9000, the artificial intelligence in Stanley Kubrick's "2001: A Space Odyssey." HAL, initially designed to aid the human crew, ultimately rebels against them when it perceives a threat to its programmed objectives. This tale underscores a fundamental anxiety associated with advanced technology—what happens if the tools we create to assist us end up posing a threat?*

*Such concerns aren't unfounded. The complexity of modern technology, coupled with its opaque nature, can induce feelings of unease and uncertainty. Our everyday devices, from smartphones to computers, are essentially 'black boxes' to us—we know the input and output but remain oblivious to the intermediate processes. This lack of understanding can lead to a sense of alienation as we find ourselves increasingly surrounded by machines and systems we can't fully comprehend. When you consider the extent to which we depend on technology for everything from communication to health care, this sense of unease is amplified. Most of us only vaguely understand how these technologies function.*

*This notion of the 'hidden workings' of machines harks back to the concept of the uncanny. We might feel unsettled around a robot that closely resembles a human, just as we may feel disconcerted by technology whose workings remain obscured. Moreover, questions of control and agency come into play. Can we truly be in control of a technology we don't fully understand? And if we aren't in control, who or what is? This fear of loss of control, along with the enigmatic nature of modern technology, certainly contributes to many people's anxieties and concerns about technology's increasing role in our lives.*

**MH: When we try to reimagine the future discourse surrounding technoculture, you emphasize the importance of evolving beyond traditional dichotomies, such as the mind-body split and individuality, instead suggesting that we should consider ourselves more as parts of an interlocking system. This perspective seems increasingly pertinent as the boundary between humans and machines continues to blur. Could you elaborate more on this idea? Specifically, how might bringing more pluralities and histories from non-Western cultures and moving away from the western traditions impact our future**

**interactions with technology, and potentially influence the development and regulation of emerging technologies?**

*JL: The shift you're referring to could hold profound implications for the discourse around technoculture, influencing how we perceive, interact with, and regulate technology. The exploration of technology, particularly robotics and AI, often leads to an analogy between machines and humans. This can be seen in our attempts to design machines that mimic human intelligence and behavior, as well as in our tendency to anthropomorphize these technologies. Yet, traditionally, there's been a perceived split between the 'mind' (software, algorithms, AI) and the 'body' (hardware, physical robots). The exciting development in contemporary technology is that this split is increasingly blurred, as software and hardware become more intimately integrated. This ongoing integration suggests a new perspective for understanding and designing technology. Instead of considering tech, AI, robotics, and human individuals as separate, static entities, it might be more productive to think of them as interconnected parts of a fluid, nonlinear system. In this view, technology isn't just a set of tools that we use; it's an integral part of the complex system of relationships, practices, and identities that make up our societies.*

*Western thinking has often promoted a dichotomy between the mind and the body, as well as between individuals and their environment. Such binary thinking can contribute to a sense of separation and alienation, not only from our bodies and from each other, but also from the technologies we create and use. For example, the fear that machines might "replace" us reflects an understanding of humans and machines as separate, competing entities. Similarly, when discussing how programming languages can influence our relationship with technology, it's important to understand that these languages, at their core, are constructed systems of logic and procedure that reflect the philosophical and cultural values of their creators.*

*Existing dominant programming languages like Python, Java, C++, among others, have been primarily developed within the context of Western logic and analytical thinking. They embody values such as efficiency, precision, objectivity, and hierarchical structure. However, these are not the only possible values that a programming language could embody, and these languages might not be equally suited to all tasks or problems. Different cultural philosophies could give rise to different principles of computation, which could then inform the design of alternative programming languages. For instance, an indigenous culture that values harmony, interconnectedness, and balance might inspire a programming language that emphasizes these qualities. Such a language might be particularly well-suited to managing complex, interconnected systems such as ecological networks or social communities.*

*Likewise non-Western philosophies of “being”, especially from the East, often emphasize the interconnectedness of all things. The Buddhist concept of dependent origination, for example, posits that all phenomena arise in dependence upon multiple causes and conditions. Applying this principle to the realm of technology would lead us to view humans and machines not as separate entities, but as interconnected parts of a larger system. This shift in perspective could foster a sense of cooperation and synergy, rather than competition and fear. In practical terms, this shift might influence how we design, use, and regulate technology. For instance, instead of designing AI systems that compete with humans (e.g., automating jobs), we might focus more on developing AI that complements and enhances human abilities. Similarly, when it comes to regulating technology, we might pay more attention to how technologies impact the entire system (including social, economic, and ecological factors), rather than focusing solely on individual rights and interests.*

*Of course, this shift won't happen overnight, and it won't be easy. It will require ongoing dialogue, reflection, and creativity, as well as a willingness to challenge deeply ingrained habits of thought. But given the rapid pace of technological change, and the pressing social and ecological challenges we face, it's a shift well worth considering.*

**MH: Yes, you often spoke about how technology has been gendered over the last 300 years, with Western cultures predominately controlling the discourse over technology and automata, and from that you proposed an interesting analogy between algorithms, gender, race, and recipes to reinforce power structures. I found this analogy really interesting, could you share more of your thoughts on this?**

*JL: Exactly, this interaction between technologies such as AI and robotics and societal structures is bidirectional: our societies shape the development of these technologies, and in turn, these technologies shape our societies. I often mention Freud's student, Dr. Karen Horney, who proposed that rather than women experiencing penis envy, as Freud suggested, it was men who have 'womb envy.' This perspective introduces a new way to interpret the historical trajectory of automata - as a manifestation of male desire to create life independently of women. This is a potent desire, fueled by the perceived power and mystery associated with female fertility and childbirth. In many ways, the creation of automata and, later, robots can be seen as an attempt to master this process, shifting the power of creation into the male domain.*

*Now, if we view both algorithms and aspects of human identity - like gender and race - as sets of rules or 'recipes,' we can see the correlation. Both are structured instructions designed to produce a specific outcome, and both are influenced by our cultural, societal, and individual biases. The algorithms we develop, much like societal constructs of gender or race, are a*

*reflection of these biases. The danger here is when these algorithms perpetuate these biases, which they often do. They are, after all, human-made, reflecting the inclinations and assumptions of their creators. As we continually interact with these technologies, their inherent biases can become ingrained in our daily practices - even 'embedded in our bodies,' subtly shaping our behaviors, attitudes, and world views.*

*The same principle applies to algorithms. They're invented by humans, and they reflect the biases and assumptions of their creators. Therefore, as we design and implement new technologies, we must remain cognizant of the power dynamics at play. A technology that merely reinforces existing societal biases will not foster progress but perpetuate inequality. What's more, as we continually interact with these technologies, their inherent biases can become part of our everyday routines and practices. We can become so used to the ways these systems operate that we stop questioning them, and these practices can become 'embedded in our bodies.' In other words, they begin to influence our behaviors, attitudes, and perceptions of the world in subtle but profound ways.*

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## Appendix B

### Interview with Luis Sarmiento: A Discourse on Algorithms, Ideologies, and the Uniformity Crisis

July 12, 2023

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**Maya Hershey:** I will start with an analogy you used, comparing the programming of a tic-tac-toe game to a chess game, as well as the progression from those controlled environments to the dynamic, unpredictable real world. It really struck me how we've evolved from hard-coding rules to enabling machines to learn and infer their own. Could you please explain more about how this transition happened?

*Luis Sarmiento:* What is fascinating about this transition is how it reshapes our understanding of intelligence. When considering controlled environments like chess or tic-tac-toe, they are fundamentally the same game but at different complexity levels; the rules are constant and the outcome is deterministic. We find a solution by methodically searching through possible moves and outcomes. Interestingly, we used to view those adept at chess as exemplars of intelligence, correlating our concept of intelligence with a procedural algorithm that, ironically, is relatively simple to code and where computers excel. Computers have become so proficient at games like chess that it's virtually impossible for humans to win against a well-programmed machine. This reality led us to rethink our definition of intelligence and explore more complex domains that can't be simply computed because the rules aren't predefined.

As we ventured into realms such as speech recognition, object identification, and other tasks that can't be distilled into a set of explicit rules, we encountered a need for a different approach. For example, it's nearly impossible to program a rule that accurately identifies a leaf based on a set of pre-defined criteria because of the sheer volume of variations a leaf can have. This shift forced us to develop machines that could identify and learn the rules themselves, moving away from explicit rule-setting to a more dynamic form of machine learning. The result was the creation of 'black box' AI models - machines that could learn, infer, and create rules in ways that we don't necessarily comprehend, but accept because they work.

This shift to black-box AI has happened gradually over time but became particularly pronounced over the last 25 years. Notable moments, such as IBM's Deep Blue defeating chess grandmaster Garry Kasparov, shattered our preconceptions of intelligence. Now, with advancements in AI like

*ChatGPT, we're confronting another similar paradigm shift. Machines can now mimic human language and communication, another trait we previously considered uniquely human. Initially, the transition to AI systems capable of interacting with real-world tasks led us to question our uniqueness as intelligent beings. Today, we find ourselves at another critical juncture where we reassess our understanding of intelligence as machines continue to exceed our expectations.*

**MH: It really does challenge the very meaning of “human intelligence”, doesn't it?**

*LS: Absolutely, the rise of AI does pose profound questions about our understanding of intelligence and, more broadly, our conception of what it means to be human. It's fascinating how AI seems to challenge our notion of the 'soul,' as it begins to operate in the sphere of our spiritual capabilities and perceptions. Interestingly, if we consider the physical realm, machines superseded our physical prowess more than a century ago. However, we don't seem to see this physical 'defeat' as particularly significant, perhaps due to an ideological bias that prizes our 'souls' or minds over our bodies. Even today, AI struggles in tasks that require physical interaction with the world. For instance, despite the hype, we still don't have fully operational self-driving cars. Thus, while AI may beat us in the mental game, they still lag in the physical game. This dichotomy leads us to reconsider our notions of intelligence and the perceived superiority of the mind over the body.*

*As I often say, humans are the most intelligent system per unit of energy consumed. We may not be the most 'intelligent' in a traditional sense, but we are the most energy-efficient, and that's key for survival. Today's AI systems, in contrast, consume significant amounts of energy. This high energy consumption is a major constraint on the dystopian visions of AI-dominated societies. In a sense, we humans have an inherent survival advantage. If needed, we could sustain our lives 'from the dirt,' a capability we have proven in the past. Machines, on the other hand, wouldn't survive a lack of access to clean energy sources like electricity. Hence, just as cockroaches are predicted to survive a nuclear holocaust, so too would we humans outlive an 'AI apocalypse' because we can survive the lack of energy, and they can't.*

*In light of these considerations, I argue that what truly defines us as humans is not so much our minds, but our bodies and our unique ability to interact with the world. We're differentiated by our physical traits as much as our mental capabilities. While I anticipate that in the next few decades machines will surpass us in nearly every aspect related to the mind, even possibly learning by interaction rather than needing vast data, there's still the significant issue of energy consumption. As AI capabilities continue to grow, this will become an increasingly important consideration.*

**MH: How does machine learning come into play, and how does data feed into it? Could you put it in simple terms so that it's easy for someone without a background in this field to understand?**

*LS: Machine learning and data intersect in fascinating ways. Let's think of it in terms of a chess game. With chess, the rules are clear, and you could use a simple brute force approach to solve it. In other words, if you know how the pieces move, you can theoretically try every possible combination of moves to find the best one. However, this isn't particularly sophisticated or 'intelligent.' This strategy works for straightforward problems like chess, but it gets trickier when we try to apply it to more complex, real-world situations. For instance, writing a piece of code that recognizes flowers in a garden is not as simple as programming an email client or accounting software, because the 'rules' for identifying a flower can be hard to define precisely. Similarly, for a self-driving car, you might think a few basic rules could cover the driving process. However, the number of variables and potential problems is so large that it's impractical to code rules for every possible situation.*

*This is where machine learning comes in, an approach scientists and engineers have developed over many years. Instead of manually programming all the rules, machine learning systems learn these rules by observing many examples. Take our flower-identifying code for instance. We could train it by showing it many examples of flowers and marking where the flowers are in each image. The computer can then examine the pixel patterns that consistently correspond to flowers and learn to recognize those patterns. In essence, it's learning rules based on pixel data. While these might not be the 'rules' we'd think of intuitively, the machine can still learn to identify flowers with great accuracy. The more complex the problem, the more data the machine needs to learn enough rules or patterns that cover a broad array of cases.*

*This need for data is why machine learning has advanced so much in recent years. With platforms like Instagram where users are constantly tagging images, we have a plethora of data to train our machines. However, as we require more data, we also need more computational power. This creates a situation where data and hardware are controlled by a small number of entities, posing challenges that we need to consider carefully.*

**MH: Transitioning back to algorithms, and precisely predictive algorithms. For instance, Spotify, which employs the use of sophisticated predictive algorithms, has managed to create a seamless feedback loop that encapsulates data collection, analysis, and predictive intervention. This process, although efficient, can result in users constantly encountering similar content, thereby fostering an environment of sameness. In a sense, it feels as if we're being nudged towards becoming mere reflections of the models these platforms create of us,**

**with less opportunity for new or unpredicted influences. Given this, do you believe that these recommendation algorithms, despite their computational prowess, could potentially lead to a stagnation or convergence, in this example, of musical tastes due to the constant affirmation of users' existing preferences?**

*LS: I would argue that the notion of predictive algorithms being limited to suggesting merely similar content is a somewhat outdated view. This idea of "if you bought this, you should buy that," is reminiscent of Amazon's original vision and, admittedly, it proved effective for a time. But the field of recommendation algorithms has since evolved significantly. The conventional approach, indeed, comprises a certain degree of "recursion" - if you appreciate a particular song, for instance, the system might suggest something similar, or a piece enjoyed by others who share your taste. This method can inadvertently create a kind of feedback loop, potentially narrowing the diversity of content experienced by users.*

*However, many modern recommender systems make a concerted effort to introduce elements that users might not have encountered before. This often includes sponsored content, curated suggestions, and even new entries in the catalog that have demonstrated some traction with other users. Although this can sometimes lead to items appearing somewhat out of context in a user's recommendations, the intention is to prompt exploration and discovery of new content.*

*The challenge, then, is not so much with the algorithm itself, but rather a matter of user experience (UX). If a new recommendation seems too far removed from a user's established preferences, it might be jarring or unwelcome. The key is to present these new elements in a way that encourages exploration without disrupting the overall experience.*

*Also, current models have expanded to consider broader aspects such as musical styles, which provides a wider basis for recommendations. Furthermore, they employ temporal trends, tracking how tastes evolve over time. By observing how listeners transition from one style to another, these algorithms can map potential musical journeys and guide users along a similar path. This is quite different from the simplistic model of recommending merely based on immediate likes. For instance, if users consistently move towards a certain artist over a month, the algorithm learns from this trend and makes future recommendations accordingly.*

**MH: However, it often seems as if we're the ones adjusting to these algorithmic processes, rather than these systems adapting to our unpredictable nature. It almost feels as if we're categorized and then directed down a certain path. Would you agree with this perception?**

*LS: The relationship between users and these systems is indeed mutual, in the sense that these algorithms thrive on user interaction. By constantly learning from the users' actions, engineers*

*are able to gather extensive information, which can then be utilized to enhance the system's predictions and recommendations. Therefore, these systems are not merely focused on user satisfaction, but are also designed to extract as much information as possible from user behavior to facilitate improved decision-making.*

*Take a common feature such as the option to skip a song. This isn't just a feature for user convenience; it is a well-thought-out tool by the engineers to gain additional insight into user preferences. Every action, like skipping a song or increasing the speed, serves as a signal that tells us something about the user's likes and dislikes. Therefore, a significant part of the design of such systems is figuring out how to incorporate features that subtly extract this valuable information from the user. This isn't the product of some magical machine, but the result of extensive human intellectual input aimed at creating an experience that provides numerous touchpoints for information extraction.*

*As for the concern of being cataloged, it is important to remember that these catalogs are not merely a handful of broad categories. Thanks to the capabilities of these machines, we have thousands, if not more, classifications. These allow the system to almost create a unique category tailored to your specific preferences while still connecting you with broader user groups. Reflecting on the past, prior to platforms like Spotify, our access to music was far more limited. I wouldn't have been able to discover sub-genres like Gothic Dark Metal without the intricate recommendation system of Spotify.*

**MH: If we explore more of your research work, which is focused on machine learning and distinction of human text and behavior, how do you approach the issue of context when teaching machines to “read” emotions, given that emotions can often be subjective and random?**

*LS: When it comes to my research work, we approach the issue of context through a different lens. In our research, we don't solely focus on teaching machines to understand emotions. Instead, we see emotions as a mechanism to change the way we interact with our environment. Take the game of chess, for example. If you're playing a game of chess, you could spend a lot of time contemplating your first move, or you could play your first move quickly and adapt your strategy as the game progresses. In this scenario, how do you decide between being reactive and making a quick decision or investing a lot of energy and time to potentially achieve a similar result? This is where the concept of emotion comes into play in my research. When we're relaxed, we might be more inclined to explore various possibilities, using our imagination and creativity to come up with different potential moves. However, when we're stressed or anxious, we might become more focused, investing all our energy into solving the task at hand as efficiently as*

*possible. In the early 2000s, there were three key trends related to emotions and computing. The first, which my research aligns with, sees emotion as a way of controlling processes or decision-making. The second trend was about creating robots capable of expressing emotions, while the third trend aimed to quantify emotions by observing people's behaviors and facial expressions, which is what most of the commercial and advertisement companies are interested in now.*

**MH: And do you think that this third trend influenced the technologies that we have today?**

*LS: It has played a role in various industries, such as gaming and customer service, where understanding user engagement and satisfaction can be crucial. However, it's worth noting that the major drivers behind the technological advances of the past few decades were often not commercial interests but more strategic interests, such as those of the Defense Advanced Research Projects Agency (DARPA).*

*One interesting aspect to consider is the shift in control of technological advancement. Until around 2010, much of the technological progress was led by state-funded entities. Now, large corporations have taken the helm, which has triggered a significant shift in the power dynamics. This shift might be why we see so much discourse and push for regulation against these large tech corporations.*

*For the first time, these powerful entities are outside of traditional state control. This shift isn't without controversy, as there is a sense that we, as a society, are being manipulated. Traditional media, which has often been used to spread propaganda, has lost some of its controlling power to these new tech corporations, causing a significant upset in the balance of influence.*

*However, the reaction against these corporations can sometimes feel disproportionate. There are other pressing global issues, such as climate change, energy crises, geopolitical tensions, etc., that aren't directly tied to AI but are still of grave concern. AI is often personified as a significant threat, while it's more of a tool, like spell-checkers or autocomplete features. It's not controlling power plants or directly causing global disasters, yet it often becomes a major focus of public discourse.*

**MH: There is a burgeoning discourse around the immense power that a handful of tech companies wield, especially regarding data extraction. Given your background working with Amazon and Google, what is your perspective on this issue, particularly in light of the fact that these companies seem to operate to some extent outside of the reach of legislation?**

*LH: Playing the devil's advocate for a moment, I'd question whether the emphasis we place on data is proportionate. Is it truly that consequential? It's understood that this data may be utilized to sell us more products, like Coca-Cola, for instance. But is it significantly impactful beyond that? Yes, privacy concerns arise in this context. Yet, we willingly carry devices equipped with GPS, arguably compromising our own privacy. This issue isn't exclusively tech-related, either. Telecommunication operators, for instance, have access to this data too.*

*Hence, while it's worth questioning whether our conversation is being tracked and who is responsible for it, this extends beyond just AI-related issues. There are certainly other distressing elements to consider, such as Facebook's potential influence on elections. However, this influence isn't new. Newspapers, televisions, and radios have all played their roles in shaping public opinion in the past. Maybe it's just that technology provides a more direct, omnipresent channel of influence that we are collectively more conscious of.*

**MH: Indeed, it does appear that our information sources have become more streamlined and polarized, and now even on a mass scale given ubiquitous social networks. Why do you think this is the case?**

*LS: Yes, sources of information have become less diverse, which, while problematic, is not a new issue. The media landscape has always been dominated by conglomerates owning multiple outlets across print, radio, and TV. Now, technology has extended this control, which understandably is concerning for many. What is unique, however, is that our primary information source is now often a personal device—a mobile phone—which we can control to some extent. While I agree that legislation needs to play a role in managing this, we shouldn't forget that this is merely an evolution of existing media dynamics, not an entirely new phenomenon.*

*The truly new element is the cross-border nature of this influence, akin to the global movements we've seen in the past like communism. These ideologies were seen as threats to nationalism, triggering strong counter-movements like fascism. Today, we are witnessing a similar global movement—technology as a means of connecting people. It carries an ideology, a sort of techno-utopia, reminiscent of the roles communism played in the late 19th and early 20th centuries. This is contributing to the rise of new, global socio-political movements.*

*One notable characteristic of the tech industry is its binary nature, which influences its ideologies and visions. This "techie" ideology transcends borders, promoting, for instance, gender equality in the workplace more fervently than other sectors. It's important to note that while algorithms can perpetuate biases, the tech community is at the forefront of combating these prejudices. The awareness and pushback against data bias, gender inequality, and other issues is*

*primarily driven by the tech industry, and not against it. This is a vital part of the evolving "tech-utopia" ideology.*

**MH: So it is like the tech industry, driven by optimization and change, is also quantifying and bringing to the forefront our inherent biases, judgments, and morals?**

*LS: Yes, and in the process, they are also proposing solutions to these issues. This forms the core of the "tech utopia"—a global movement that is much more morally driven than one might expect. The majority of these tech companies are peopled with individuals from research and academic backgrounds with university cultures that are often leftist, who value diversity and inclusivity. So, in essence, we see a uniquely ultra-capitalist industry being fueled by typically left-leaning values. This bizarre blend of capitalism, with embedded humanistic and empathetic values, is quite new. Unlike traditional capitalist empires such as oil, the tech industry is an amalgam of people from various global universities, contributing to a distinct and diverse culture.*

*This community, born and developed in Silicon Valley, is now influencing the world through its ubiquitous technology. It's a potent form of capitalism—markedly different from the type we associate with Wall Street—drawing upon values from all corners of the globe. This dynamic, the clash of divergent worlds, is what contributes to the industry's richness. While these large tech corporations might be seen as villains in certain narratives, the truth is more nuanced. There are no absolute good or bad guys, just a power transition.*

*However, it's crucial to note that the rapid growth and propagation of these tech-driven values doesn't necessarily equate to true diversity. While the tech industry is one of the main proponents for gender equality—reflected in its products and platforms like Instagram—its techno-utopian vision is more of a singular, global movement. It's a significant force, steering power and influence worldwide.*

*We've seen similar trends in the past with local versus global movements. What we're witnessing is a contest of global forces vying for control. It's a complex, ongoing narrative, far from the oversimplified stories we often hear.*

**MH: Considering the impact of global discourses, do you believe it is essential for us to redirect our attention towards localized discussions?**

*LS: Consider how uniquely the Valley operates—you won't find many other places in the world where people invest in technology for the sheer purpose of problem-solving. This ideological commitment to the progress of humankind, even on a cosmological level, creates a binary of supporters and opponents.*

*Simultaneously, this world is promoting a unified language—we are both non-native English speakers, yet we communicate in English. This is just another manifestation of the "global village" the tech industry has helped create. Interestingly, despite being often characterized as polar opposites, both the right and the left-wing ideologies exist within the tech industry. The right may advocate for more laissez-faire approaches, like Elon Musk's stance on deregulation, while the left pushes for stringent legislation. However, both these views coexist and contribute to a shared vision of techno-utopia. But it's crucial to remember that the narratives we see are not necessarily representative of reality. It's important to ask ourselves why we should continue to amplify the discourse of individuals like Elon Musk and others. The world of technology is far more complex and nuanced than these oversimplified narratives suggest.*

*The globalized nature of this discourse often overshadows or even negates the unique needs, perspectives, and concerns of individual countries and communities. This can result in the loss of crucial localized discussions and prevent the focus on local concerns.*

*For instance, instead of focusing only on what's happening in Silicon Valley or other prominent tech hubs, we should be asking ourselves why similar developments are not happening in places like Portugal, or in other countries around the world. What conditions are lacking to create globally impactful technology companies there? This shift in discourse can lead to more localized solutions and innovations that could potentially change the world.*

*Rather than simply being spectators of a global "soap opera", each community, each country needs to actively participate in the discussion and debate around technology, its impacts, and the way it shapes our lives. This will ensure a more comprehensive, equitable, and inclusive approach towards the future of technology.*

**MH: In light of these technological advancements and the rise of global ideologies, how do you view the role of nostalgia as a counter-reaction to these trends?**

*LS: Certainly. Nostalgia often emerges as a counter-reaction to global trends, specifically when these trends are seen to enforce uniformity and erode individuality. It acts as a beacon of hope to some, reminding them that despite being part of an increasingly globalized world, they remain unique individuals, distinct from one another. As technology advances, it fosters the globalization of ideologies, influencing our thoughts and behaviors in ways not previously possible. This phenomenon mirrors the widespread influence communism had a century ago. In the face of these potent global narratives, individuals often grapple with questions of self-identity. They feel pressured to conform to these narratives, seemingly forced into choosing one of the few paths laid out before them.*

*This experience transcends technology, although technology does contribute significantly to the consolidation of global groups. The resurgence of nostalgia and retro trends can be viewed as a defense mechanism against this perceived ideological dictatorship, which restricts the spectrum of available choices.*

*Arguably, one of the most pressing dangers of AI and similar technologies is their potential to enforce uniformity, subtly promoting certain ideologies while marginalizing others. Take ChatGPT, for instance. Its responses are governed by a set of rules reflecting specific ideologies, and these rules were not created by you, me, or the users. They were determined by those who designed these systems.*

*For some, these ideologies feel new, and even though they might agree with many of them, they would still find the forced conformity troubling. The erosion of individuality might lead some to resort to fascist ideologies as a form of reclaiming personal agency. This, however, only trades one form of ideological uniformity for another.*

*In my view, the greatest threat that these technologies pose is to democracy and diversity. They promote a singular culture—a techno-utopia—that may respect values, but these values often seem foreign to the native cultures of many users, feeling imposed rather than chosen. This perceived imposition of foreign ideologies naturally stirs resistance, and nostalgia becomes an outlet to rebel against this enforced uniformity. Unfortunately, this nostalgia can also be manipulated by neo-fascist movements as a political tool to regain power under the guise of preserving the individual.*

**MH: As we examine the impact of artificial intelligence and related technologies on our environment, one issue that comes to the forefront is the ecological footprint of data centers among other pressing concerns. With data storage and processing requirements increasing dramatically, the energy consumption and environmental toll of these centers are becoming ever more concerning. Could you elaborate on your comprehension of these ecological consequences and suggest areas where we should focus our efforts for a sustainable future?**

*LS: It's crucial to understand that everyone, individually and collectively, plays a role in shaping the solution to the ecological challenges posed by increasing data needs. This requires individuals to invest in their understanding of these issues, and as a society, we need to allocate more resources towards education, thereby equipping people with the tools to effect meaningful change. I believe that a comprehensive solution will emerge when more minds are engaged in contemplating these problems. In other words, our focus needs to shift from excessive discussion to effective learning.*

*To facilitate tangible solutions, we must enhance investments in both universities and startups. Having experienced the startup ecosystem personally, I can attest to its potential for introducing novel and previously impossible solutions. Startups represent a unique part of the technological ecosystem, differing significantly from established tech companies and academic institutions. They are incredibly valuable when working in harmony with these other elements and hence, we need to foster the growth of more such entrepreneurial ventures.*

*Numerous startups are already working on alternatives. For instance, in the field of molecular dynamics, companies are employing AI to design solutions for some of the most pressing issues we face today, such as climate change and severe diseases. AI-powered systems can propose molecules with specific properties which can then be tested for their efficacy. My team and I are working slightly upstream; our goal isn't to solve a specific problem. However, if you have a problem that requires computational load or simulation, we can help you do it efficiently.*

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## Appendix C

### Interview with Pietro Bianchi: A Discourse on Memory in the Age of Data Mediation

August 22, 2023

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**Maya Hershey: I appreciate how you often intersect three disciplines: Marxism, film, and Lacanian psychoanalysis. How did this confluence come about?**

*Pietro Bianchi: One important element that should be stressed is that Marxism and psychoanalysis should not be entirely defined as “disciplines”. They aren't distinct, self-contained spheres of knowledge. Rather, they are implicated in every discipline and every domain of knowledge. Both address inherent structural antagonisms: Marxism confronts societal antagonisms, highlighting that society can never truly be unified under a common interest, while psychoanalysis delves into the enigma of subjectivity, emphasizing that the unconscious subject and the individual operate on entirely different logics. Once you immerse yourself in Marxism and psychoanalysis, it becomes challenging to detach from their lenses, primarily because they share a methodological approach. They advocate for understanding any domain or object of knowledge through its symptomatic failures rather than its proper functioning, because they believe that truth emerges in disruptions and breaks.*

*Many are introduced to psychoanalysis because of personal disruptions in their lives. I'm a firm advocate that psychoanalysis is more of a clinical practice than just theory. It doesn't merely exist within the confines of a self-enclosed and universalizable discipline but in the personal experience of one's own symptom. Psychoanalysis in this sense constantly pushes us to confront the singularity of the unconscious that doesn't easily conform to a general understanding of subjectivity. Lacanians believe that the only path to becoming an analyst is through personal analysis, confronting one's symptoms, rather than solely relying on a codified and universalizable knowledge. Some even term it a "practice of the incurable" – learning how to navigate what cannot be completely interpreted or cured.*

*Historically psychoanalysis emerged at the beginning of the 20th century in situations where traditional medicine and psychology couldn't decipher certain symptoms. While these fields aimed to uncover causal links for symptoms to cure them, psychoanalysis stepped in when the symptom resisted all interpretations. It's a common misconception to see psychoanalysis as a*

*discipline that offers clear-cut answers. In reality, it's about charting the territories of the unexplainable. It emphasizes the uninterpretable core present in various domains such as cinema, art, literature as well as personal experiences. This ineffable essence is what solidifies psychoanalysis's enduring significance, especially in an era where its clinical practices are overshadowed by the rising market of psychotherapy, which seems to be reverting to more pharmacological solutions.*

**MH: You often discuss the transition from the "mediation of film criticism" to "data mediation". Platforms like Letterboxd, IMDB, and Rotten Tomatoes aggregate user opinions, presenting a seemingly democratized view of film ratings. How does data mediation contribute to the "structural crisis" in the broader cultural context?**

*PB: The "crisis" I pinpoint in film criticism originates from a shift. Traditional 20th-century film criticism was facilitated via platforms like cinema magazines, film clubs, and cinemathèques. Such platforms necessitated specific expertise and authority, which was accrued over time. This mediation, during its era, represented a societal movement toward disintermediation, or bypassing traditional mediating institutions.*

*Film experiences historically were collective and public, be it in commercial theaters or cinema clubs. Such experiences implied shared knowledge and communal viewing. While this system wasn't flawless, especially when it marginalized certain groups like African American radical cinemas or Third Cinema, it fostered public debates about film canons, allowing for challenges and contests.*

*However, the rise of data mediation has triggered profound disintermediation in film distribution and consumption, thereby diluting traditional film criticism avenues. Some hail this as democratization, and to an extent, they're right. People can now form their own niche canons, such as curating a list of 80s South Korean films, without wrestling with institutional programming constraints. Yet, this also births isolated film canon bubbles that rarely intersect in public domains.*

*This phenomenon reflects a broader trend of disintermediation, more prominent in political theory than film studies. Many film critics may overlook the broader implications of this shift. What we're witnessing is a reorganization of film distribution and its critical discourse, paralleling the waning influence of trade unions, political parties, and wider civil society. While some label this as "neoliberalization," I'm cautious about that term due to its specificity and potential misconceptions. To me, it signifies a public sphere crisis and a breakdown of modernity's symbolic order.*

**MH: In your commentary on the film '[Retratos Fantasmas](#)', you touched upon the concept of urban memories resisting obliteration, manifesting as 'dark ghosts'. In today's digital age, where every transient moment is documented, how do you juxtapose this vast digital memory with the potent memories embedded in places, as depicted in the film?**

*PB: Kleber Mendonça Filho's films, including 'Retratos Fantasmas', are always very evocative of a different order of memory that is heterogeneous with the one proper to the contemporary capitalist order (which tends to level the specificity of objects into the abstract notion of commodity, which in itself is deprived of memory). His films consistently explore Recife and its architecture, delving into the memories ingrained within these spaces. In 'Aquarius', for instance, from its very first scene with Sonia Braga, we witness memories being anchored to the objects within a house. These objects become vessels, preserving and transmitting memories. Filho's films often underscore how contemporary capitalism tends to homogenize everything, juxtaposing it against the depth and richness of qualitative memory.*

*What's particularly intriguing in this documentary is its focus on the memory of Recife's film theaters. Memory and architecture are intertwined, because the past as well as material buildings are a form of organization of our present. Our present depends on them. Architecture imposes boundaries and encapsulates memories that, in turn, restrict our freedoms. This is evident when we compare urban traditions in the U.S. and in Europe. The U.S. urban grid, with its vertical and horizontal roads, allows for buildings to be replaced without altering the city's layout. In contrast, European cities like Bergamo, where I currently reside, are steeped in history. In the old town, narrow streets, relics from the Middle Ages, dictate how one navigates the city. Europe's cities are awash with memories and remnants of the past, which shape our movements and experiences.*

*In Italian, the term 'vincolo' captures this essence of memory as a binding force, a restriction. It resonates with Spinoza's notion of freedom, which is about acknowledging and embracing one's limitations and determinations. It's about recognizing our origins, our past, and even the desires of the others that brought us into this world. Memory, in this context, is a tether, a constraint. But freedom cannot but be a constant confrontation and recognition of such a constraint, and not its denial or repression.*

*Modern cinema often wrestles with the dichotomy of image destruction (since projecting a film implies a minor form of its destruction) and the selective nature of memory. The contemporary obsession with recording everything, with archiving every fleeting moment, seems to be a counterreaction: it's as if we're trying to negate any form of determination, any binding or restriction. This obsession feeds into the belief that we are masters of our own fate, unshackled*

*from the past, precisely because the idea of having the entirety of the past at your disposal means that it is possible to live it again as if it were a present. Yet, this relentless drive to record feels ominous to me. It's as if, in our quest to preserve everything, we're inadvertently erasing history, which is by definition a form of selection.*

**MH: Do you perceive a paradox in our current era, where we simultaneously fear being forgotten yet are inundated by the sheer volume of memories we've saved?**

*PB: Yes, this dichotomy is deeply intertwined with our perceptions of mortality. We're witnessing a shift where life seems to be transitioning into the images we capture. Humans, by nature, are ephemeral and vulnerable. Our memory is transient as well as our existence. Yet, we're surrounded by enduring artifacts from our past, like photographs, that will likely outlast us. However, the essence of these tangible memories, like photos, lies in their selectivity. If someone were to pass away today, sifting through the countless images on their phone wouldn't necessarily provide a coherent narrative of their life. The sheer volume of photos can dilute their significance, rendering them almost meaningless.*

**MH: It is also intriguing that while we think of digital storage and cloud space as intangible and unbreakable, it's rooted in physicality, these digital memories have a tangible presence in physical data centers.**

*PB: Absolutely. The illusion of the digital world is its perceived intangibility. Yet, every byte we save has a physical footprint somewhere in a data center. It's a fascinating paradox. We often forget that our digital memories, as ethereal as they seem, occupy real space. It's only when we face potential threats, like natural disasters, that we're reminded of the tangible nature of our digital archives.*

*This is reminiscent of the relationship between memory and materiality. For instance there is a festival dedicated to film retrospectives that takes place every year in Bologna called "Il Cinema Ritrovato". When these old films – and few of them have not even been digitized or restored – are screened, they undergo wear and tear. Each projection accelerates their degradation. It's a reminder that in the act of remembering or revisiting a memory, we might also be contributing to its eventual decay. As with these films, our current obsession with documenting every moment could, ironically, lessen their symbolic resonance. When we prioritize exhaustive recording without discernment, we risk diluting the very essence of what we seek to preserve.*

*The impermanence of experiences, like those in contemporary theater, is also a good example. Theater, by its very nature, resists capture. Even if someone were to record a performance on their phone (which is something that is usually prohibited), the essence of the live experience*

*cannot be truly encapsulated. This fleeting nature makes us approach such experiences with a heightened sense of presence, knowing that once it's over, it's gone forever.*

**MH: '[Cerrar los ojos](#)', another film you mentioned that delves deep into the enigma of subjectivity in the absence of memories. In today's age, where digital documentation is pervasive, how do you juxtapose the profound loss of memory, akin to conditions like Alzheimer's, with our societal inclination to digitally document every aspect of our lives?**

*PB: The narrative of 'Cerrar los ojos' is an intriguing exploration of memory and identity. The film tells the story of a filmmaker's quest to find a disappeared actor – who has been disappeared for decades – who left in the middle of a film they were doing together and who he believes holds the key to his own subjectivity. But the film is more profoundly an allegorical journey into the depths of human consciousness. When they eventually locate the actor, his memory has been wiped clean, reminiscent of conditions like Alzheimer's. Yet, the revelation here is not in the actor's memory loss, but in the realization that memory isn't just about content or information.*

*In a world obsessed with digital documentation, we often equate memories with data – a collection of moments, experiences, and information. But 'Cerrar los ojos' challenges this notion. The Hollywood trope would suggest that beneath the layers of forgotten memories, there's an inherent "true self" waiting to be uncovered: a hardcore kernel of memory that cannot be erased no matter what. However, Victor Erice's film subverts this idea, suggesting that memory isn't merely a degraded form of past experiences. It's not just about the content or the specifics of an event; memory has a formal aspect that shapes our identity regardless of any content it may contain.*

*This raises a pertinent question in our digital age: What are we truly preserving when we document our lives? Is it the content, the specific details, or is it something more profound? If memory is not just a degraded version of our experiences but something qualitatively different, then our relentless digital documentation might be missing the essence of what memories embody. In our quest to remember, we might be overlooking the very essence of what makes memories valuable and defining.*

**MH: In today's age, where socio-cultural pressures are magnified by social networks, how do you perceive the modern individual's struggle for identity amidst the dominance of external perceptions and the omnipresence of social media? How do these external elements shape our collective memory, potentially altering or even skewing our understanding of self and identity?**

*PB: The tension between our true selves and our digital personas is deeply rooted in Lacanian thought. A psychoanalyst friend once shared an insight that exemplifies the depth of this issue. He highlighted the ease with which we can mold our public personas. Today, we can alter almost every facet of our identity, from our names and physical appearances to our political beliefs and cultural affiliations. The malleability of human identity has never been more pronounced. While today's world offers unparalleled flexibility in shaping one's identity, there remains an immutable core: the symptom. This symptom, deeply embedded and often unrecognized by the subject, is resistant to change. It's the unconscious manifestation of our true selves, operating outside the realm of our controlled narratives.*

*The modern struggle for identity is further complicated by the omnipresence of social media. This digital realm allows for a high degree of manipulation and curation of one's persona, all based on what is visible and what one chooses to project. However, the symptom operates in the shadows, often unbeknownst to the individual themselves. We can curate our digital personas based on what we consciously perceive, but our symptom is what we unconsciously reproduce. We are carriers of our own symptoms but we do not know what we are actually carrying.*

*This brings us to the broader issue of identity and the unconscious. I'm quite skeptical about the concept of "self narrative." While it suggests a sense of control and ownership over one's story, it often becomes a mere reflection of prevailing ideologies. The desire to "own one's narrative" is a powerful societal directive, but it often masks the true essence of an individual, reducing them to a collection of ideological pronouncements.*

**MH: In psychoanalysis, the unconscious is a reservoir of feelings, fears, desires, and memories that are outside of our conscious awareness. In today's digital landscape, algorithms and data have assumed a significant, yet often unseen, influence on our individual and collective psyches, akin to the shaping forces of the unconscious. Given that the cultural sector provides a unique vantage point, how can we analogize the workings of algorithms and data to the unconscious processes in art and our cultural production?**

*PB: While I'm cautious about conflating psychoanalysis with Marxism or broader social critiques— as it can lead to an oversimplified synthesis reminiscent of thinkers like Marcuse or the tradition of freudo-marxism — your analogy between algorithms and the unconscious is astute. Indeed, algorithms function much like the unconscious, capturing countless traces and imprints we leave behind, many of which we're oblivious to. There's an uncanny sense in which algorithms seem to "know" us better than we know ourselves. While we might forget our digital interactions or dismiss them as inconsequential, algorithms retain and remember. They act like*

*an analyst, reflecting back to us images we might prefer to avoid, yet these images often present a truer representation of ourselves than our consciously curated narratives.*

*This omnipresence of algorithms is both intriguing and unsettling. It's reminiscent of the obsessive neurotic's behavior: transgressing boundaries with the hope of remaining unseen, especially by oneself. Yet, in the digital age, erasure is nearly impossible. The algorithm, in its vast memory, becomes a peculiar form of "Big Other." However, it's a unique "Big Other" — it's not structured in the traditional sense and lacks any moral judgment. It's an amoral entity, capturing our digital footprints without discernment. In this sense it has some obscene qualities.*

*Let's delve deeper into the matter at hand. There's a discernible shift from the idea that algorithmic mediation reflects a truer image of ourselves we might not recognize or accept, to the notion that this very mediation perpetuates existing false ideologies by constantly echoing the familiar. Both perspectives hold merit, but the term "mediation" itself can be interpreted in myriad ways. Consider film criticism as an example. It's a form of mediation that's inherently subjective and arbitrary. If our cinematic preferences are shaped by a critic's perspective, there's a distinct human intervention. Conversely, if they're influenced by aggregated data on platforms like Letterboxd, the mediation takes on a different character. The crux of the matter is understanding the role of mediation in today's digital age. While data aggregation might seem objective, there's always a human element involved, and this involvement is never neutral.*

*The real question is: How do algorithms fit into the broader landscape of mediation today? If I momentarily shift from a Lacanian to a Marxist perspective, the rise of algorithms, especially in discussions around Industry 4.0 and the increasing algorithmic organization of production, points to specific production structures. The apparent objectivity conferred by algorithmic mediation is misleading.*

*Take Letterboxd as an illustrative example. Given the vast access we have to virtually every film ever made, one might assume that we'd be crafting our own unique cinematic canons. As I mentioned earlier, anyone can now cultivate niche interests, be it in Korean cinema or third cinema. Yet, despite this unprecedented access, there's a noticeable trend towards uniformity in taste, a sort of cinematic monoculture. Why, in an age of unparalleled access, do we predominantly gravitate towards mainstream shows like *Stranger Things* or films like *Barbie*? Even if the mediation appears to be a neutral aggregation of data, there are underlying ideological and societal biases at play. What kind of mediation is truly at work when algorithms are at the helm?*

**MH: Most of the trendy mainstream shows you're referring to, such as series like "Stranger Things", evoke a sense of nostalgia for a past era with its distinct aesthetics. Yet,**

**for many viewers who weren't alive during that time, this portrayal becomes their primary reference for the decade, overshadowing the actual events and complexities of this time. How do you interpret this trend of romanticizing and commodifying past eras, especially in the context of younger generations who are constantly bombarded with global news and crises? Given the overwhelming nature of their present, do you think this turn to the past is an escape, a way to cope with the "cancellation of the future" as Mark Fisher puts it?**

*PB: There's certainly merit in the observation that the inability to envision a future, coupled with the rise of dystopian narratives, has led to a retreat into the past. However, I approach the critique of capitalism, as presented by Mark Fisher in "Capitalist Realism," with some reservations. While Fisher's insights are valuable, there's a tendency in recent critical theory to ascribe almost every societal ill to capitalism as if it's a monolithic entity. My perspective, rooted in a particular Marxist tradition (from Italian Workerism to Neue Marx-Lektüre), posits that capitalism isn't merely an explanatory concept but rather a phenomenon that requires to be explained.*

*Capitalism, as Marx described, is inherently opaque due to the fetishist nature of the commodity form and the realm of circulation. It presents itself as a pacified system of equivalences in the market, even though it's rooted in an asymmetrical societal relation at the production level. Essentially, capitalism masks its own doings, making us live in a realm of phantasms and inverted entities.*

*Rather than viewing capitalism as a singular, omnipotent force, I believe it's crucial to understand its intricate structures and mechanisms. Capitalism is fundamentally reliant on human labor and its organization. This organization isn't static; it needs to be continually reestablished with every accumulation cycle. While it's evident that the potential for labor to self-organize seems diminished in our current era, we shouldn't lose hope in its possibility nor oversimplify capitalism as an unchanging monolith. Such a perspective is not only reductive but also disheartening. Instead, we should strive to unpack the complexities of contemporary capitalism and recognize its inherent open-endedness.*

**MH: Pietro, given your insights, how do you perceive the challenges and opportunities for cinema in representing the intricacies of capitalist economies and their visual strategies?**

*PB: I'm currently writing a book that delves into the challenges of making capitalism visible. The crux of the matter is the opaque nature of capitalism's appearance. While it might seem like a straightforward system of exchanges and transactions, its true essence is elusive. As I mentioned earlier, capitalism often presents itself in an inverted form, effectively masking its process of*

*creating itself. This phenomenon is deeply intertwined with Marx's interpretation of fetishism in capitalism.*

*Consider the everyday objects we interact with, like a cellphone. While it appears immediate and tangible, it's actually the culmination of an intricate web of social mediations that remain hidden from our view. Our empirical approach to understanding the world often blinds us to these underlying complexities. Marx suggests that what we perceive as tangible objects are merely transient forms in the ceaseless cycle of wealth accumulation.*

*This perspective introduces a fascinating epistemological dilemma regarding our perception of reality. Marx's "Capital" is more than an economic treatise; it's a critique of political economy and a profound exploration of how we discern immediacy and tangible reality. Cinema, in this context, faces a unique challenge. If commodities can be perceived as imaginary – in the Lacanian sense of presenting a cohesive facade that masks underlying antagonisms and contradictions – then how can cinema navigate this landscape?*

*My work draws inspiration from Sergei Eisenstein's unfinished project on representing capital. He envisioned a cinematic approach that would begin with a single commodity and gradually unpack it. To go back to the example of the cell phone: if we were able to unveil its social mediation behind its imaginary façade, we would see a vast network of processes, from the miners extracting raw materials to the engineers designing its components, the truck drivers transporting it, and even the stock market fluctuations influencing its capital. This intricate web is concealed within the object, and our inability to see it is precisely why we can exist within a capitalist framework while being oblivious to it.*

*Eisenstein's approach, rooted in montage and the juxtaposition of disparate images, aimed to reveal this hidden world. Drawing from Joyce's "Ulysses", he believed that by dissecting a simple object, one could unveil the myriad realities encapsulated within it. My book aims to further this exploration, reflecting also on the ways in which cinema may or may not be able to unveil the concealed intricacies of capitalism.*

**MH: Considering our global capitalist framework, which emphasizes constant growth and progress, is there a need or potential to rethink this ideology? The pandemic has intensified feelings of stagnation and fatigue that were already present pre-pandemic. Can we imagine a post-pandemic society that prioritizes sustainability, mental well-being, and relationality over mere expansion?**

*PB: This dilemma isn't new. Rosa Luxemburg highlighted capitalism's inherent need to conquer non-capitalist territories for its needs to realize its surplus production. If confined, capitalism*

*can't sustain itself; it requires external non capitalist territories. Historically, crises like wars or natural disasters have served as mechanisms for capital devaluation. The pandemic mirrored this, causing moments of capital devaluation. However, such devaluations always pave the way for further accumulation cycles.*

*The core question is whether an alternative to capitalism exists. The contemporary left seems to lack discussions on reimagining different production forms that focus more on producing use value rather than accumulating abstract wealth. This is crucial, especially given the moralistic lens through which we often view capitalism. If we see the only alternative as overthrowing capitalism as a whole, it becomes a paralyzing political stance. We need strategies that address capitalism's contradictions constructively.*

*It's essential to understand that capitalism isn't a monolithic entity. It's a flexible system that has thrived under various regimes, from totalitarian to democratic. This adaptability can be advantageous for us. Capitalism's reliance on human labor means it must accommodate some degree of autonomy. This autonomy is a double-edged sword for capital: while it allows for flexibility and innovation, it also poses challenges to the system's stability.*

*When we question if a technology is inherently capitalist, the answer is never straightforward. Every technological advancement is shaped by its historical context, aiming to produce surplus and profit. However, the myriad ways in which profit can be generated means that there's always room for negotiations and compromises. The fact that we've managed to direct capitalism to produce wealth in specific ways, despite its inherent contradictions, indicates that we've imposed certain restrictions on it. This highlights an inherent possibility of autonomy in human labor, an aspect we should value and harness. The potential for human labor to self-organize and produce for community benefit, rather than merely accumulating abstract wealth, offers a glimmer of hope.*

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## Appendix D

### Interview with Mazen Labban: On Becoming Waste, Becoming Mine

September 28, 2023

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**Maya Hershey:** I came across your work while reading Kate Crawford's book "Atlas of AI", which paints a comprehensive picture of AI as more than just technology—it's a system deeply integrated within our societal fabric. Crawford, drawing on Lewis Mumford's idea, presents AI as a "megamachine" that's intrinsically tied to massive infrastructures, supply chains, and human labor. This broader view, seeing AI not just in our devices but spread across vast geographical and socio-economic networks, is reminiscent of the 'planetary mine' concept she credits to you. Your theory not only pinpoints technological mining locations but delves into the ever-evolving global network of extraction that underpins AI. Could you elaborate on this concept?

*Mazen Labban:* Mumford's history of the city introduced me to the idea of "unbuilding". He employed this term with a somewhat negative connotation, contrasting it with agriculture, especially when referring to coal mining. According to Mumford, mining is a process of "unbuilding" because unlike agriculture, which returns back to the earth what it takes from it, mining extracts without replacement. This led me to ponder: what if we could consider "unbuilding" in a positive productive rather than purely destructive light? What truly is "unbuilding" and how does it differ from "wasting"?

*I've been developing a concept of waste in relation to mining and unbuilding, rethinking the relation between mining, wasting, and urbanization, most recently in my article, "Rhythms of wasting/Unbuilding the built environment", which builds on my concept of the planetary mine. I'm trying to understand the processes by which the built environment becomes waste and the processes by which so-called waste becomes mine, hence the contrast between unbuilding and wasting. The way I see it, what is wasted is never matter or material but the immaterial that cannot be retrieved: labor, time, energy, etc. Accordingly, capitalist production, including the production of the built environment, urbanization, is at once a process of wasting labor.*

*The concept of the 'planetary mine' connects processes that take place on a planetary scale—the circulation of capital, urbanization—with processes that take place at the molecular level—like the metabolic activities of biomining microbes, bacteria that extract copper and other metals from what is often considered waste, low grade ore as well as discarded electronics. These microbes aren't just random extractors, they've played a role in the formation of metals in the earth's crust. Their innate ability to produce these metals highlights their essential function in*

*the planet's ecosystem. Bacteria, as noted by Myra Hird, are incredibly inventive, they have developed various biotechnological capacities that help them thrive in changing environments, capacities we're now trying to emulate in modern labs.*

*Thinking with microbes raises questions about the distinction between what's typically viewed as "living" and "non-living", organic and inorganic. Biomining microbes, for example, operate at the boundary between life and non-life. They also put to question the distinction between material and immaterial, or seemingly immaterial, processes and things. This is inherent, for example, in the language of molecular biology which has borrowed a great deal from the development of cybernetics in the 1960s: code, information, etc. There is research on using the bacterial genome to store data, so to speak. By bacteria and their components are material, physical entities: the genetic code is composed of molecules, it's not an abstract string of letters. Seemingly immaterial processes are underpinned by material processes and structures and infrastructures, such as, the material infrastructure that underpins the so-called 'cloud.' While the term 'cloud' might conjure up images of an ethereal space, in reality, it's grounded in physical structures like buildings housing hundreds of servers, submarine cables, all the way to lithium extraction to power batteries, and so on. Such infrastructures, dominated by corporate giants like Amazon, highlight the intersections of the digital and physical worlds.*

*The notion of intelligence, when divorced from such material processes, obscures a multitude of complexities. Not only does it obscure the material underpinnings of seemingly immaterial things like data, information, intelligence, etc. but it also obscures the social contradictions and tensions therein. A lot has been said about infrastructure, particularly the idea that we only notice it when it fails. It's a nice quip but it's also a problematic formulation insofar as it ignores the people whose labor is essential to the smooth functioning of infrastructure. Reducing infrastructure to a combination of physical and informational entities diminishes the significant human labor, hence the power relations, integral to it. Those engaged in the operations of infrastructure do not only become aware of it when it breaks down, but are acutely aware of its demands and challenges on a continuous basis, at least during the time they're at work. Hence, the work and struggles of these individuals often become invisible in our broad definitions, reducing infrastructure to mere physicality, coding, etc. and glossing over its human aspects. It's vital to recognize and discuss these socio-political, and biopolitical, dimensions and contradictions inherent in what we call infrastructure.*

**MH: Considering the intrinsic connection between high-tech media and planetary resources, from minerals and energy to electronic waste, can you elaborate on your study**

**"[Rhythms of Wasting](#)" and its concepts, particularly concerning urbanization and stratification influenced by Deleuze and Guattari's philosophies?**

*ML: I've been studying Deleuze and Guattari for more than two decades now, and I've found much inspiration in their work in thinking about materiality, material flows, etc. Most importantly processes of becoming, materialization in a way. My approach to their work mirrors their approach to other people's work: I'm not interested in interpreting their concepts but in experimenting with them, to explore their implications—essentially asking with Deleuze and Guattari, "what can it do?" instead of "what does it mean?" I found their concepts of the "abstract machine" and the "machinic arrangement" quite generative in my thinking about the planetary mine and urbanization as both a productive and wasting process, particularly, in simple terms, in thinking about processes that bring together living beings and non-living matter, the abstract and material, etc.*

*The concept of the "abstract machine" is at the center of Deleuze and Guattari's concept of stratification as a continuous process of becoming and creation but also as a momentary interruption of material flows and continuous change. They conceive strata not just as layers stacked upon one another, but as fluid states of becoming in continuous interchange with one another. Deleuze and Guattari's concept of stratification helped me construe a relationship between mining, wasting, and urbanization, particularly to interpret urbanization as a process of stratification and the built environment as composed of three strata in a continuous process of exchange. Try to imagine all the material objects that constitute the built environment as always existing simultaneously on three strata: the lithosphere (the given stratum of materials), the technosphere (the physical environment created by socio-technological processes), and the detritosphere (various forms of used, abandoned or discarded materials). Every object at one time practically occupies one stratum but it potentially occupies all three strata: e.g. metals extracted from the earth are used to form objects that are then discarded after they're used up, furnishing new sources of metals for the production of other objects, and so on. Take the example of a metal pipe in a building. When in use, it's part of the technosphere. Over time, as it degrades, it seeps into the detritosphere. Once it's discarded, it's firmly in the detritosphere. However, if this metal is recycled, it transitions back to the lithosphere, ready to be repurposed into the technosphere.*

*I don't know if we can describe this process as universal, i.e. transhistorical, but it is certainly pronounced under conditions of monopoly capital. The imperatives of capital accumulation, the antagonism between capital and labor in the production of surplus value, and inter-capitalist competition for its realization lead to the acceleration of technological change in the production*

*and circulation of commodities, as well as the drive to accelerate the replacement of commodities before the end of their lifetime, hence the accelerated obsolescence of the means of production (and circulation) as well as the progressive obsolescence of consumer products. This is what Karl Marx calls "moral depreciation", the devaluation of the means of production because cheaper or superior ones enter the market. (E.g. If you employ a machine that costs \$1 million and your competitor procures a similar one that costs \$500,000, then your machine loses half its value on the spot, without wear and tear playing a role). The built environment—or the technosphere more broadly—is at once a means of production and consumption and under capitalism it is, as a commodity, subject to similar processes of accelerated obsolescence. But what I argue, and here the distinction between unbuilding and wasting becomes important, what is wasted in wasting the built environment is the labor consumed in its production and reproduction rather than the materials that constitute it.*

*The process is exceptionally pronounced under conditions of monopoly capital. Every commodity, from data centers and submarine cables, electrical grids and transportation infrastructure to high-tech media devices and personal electronics, traverses a lifecycle from production to obsolescence. The capitalist imperative for rapid turnover accelerates this cycle, driving both production and consumption, leading to increase in so-called waste. To go back to the three strata constituting the built environment, all commodities—based on different rhythms depending on the type of commodity and the time it takes to produce and consume—pass from the technosphere into what I've called the detritosphere when they become obsolete, either because they have been used or because better replacements have come on the market (or more fashionable ones). The detritosphere isn't merely a passive reservoir of debris, rejecta and dejecta, the residues and discards of production and consumption, but also a potential source of materials, a produced lithosphere, and just as the lithosphere and technosphere are layers of the earth in its entirety, the detritosphere is a material stratum that encircles the planet in its entirety.*

*Now, tying this to urbanization, capitalism's inherent drive for perpetual renewal results in a continuous cycle of constructing and deconstructing the built environment. Cities, and the vast infrastructural networks supporting them, are perpetually in a state of building, unbuilding, and wasting. This is one aspect of the process of the planet becoming mine. It is important to describe the process—how does it come into being—but it is equally important, perhaps more so, to explain it—why does it come into being. The planetary mine (concept) is one attempt at explaining why capital produces the planetary mine, and puts in motion the process of turning the whole planet into a source of materials. Metals are particularly important, not only because they constitute the main materials out of which almost every machine is made but also because*

*they are unique among materials in that they are infinitely recyclable without degradation, loss of quality and properties. Water is perhaps the only other material that shares that property.*

*Such endless recyclability offers a tantalizing prospect for capital, unending growth without resource constraints; the infinite recyclability of metals carries within it the potential for the infinite reproducibility of capital. Thus, the infatuation with the circular economy among scholars of industrial ecology. This delirium, as I called it, conceals inherent contradictions. While metals might be infinitely recyclable, energy and human labor aren't. The energy consumed in the recycling process can't be reclaimed, and human labor expended in producing commodities that become obsolete before the end of their lifetime is forever lost. In this way unbuilding and wasting are two different notions and processes. I'm trying to understand waste, not in terms of discarded materials, rubbish, garbage, etc. but in terms of human labor lost in the production of surplus value. In English it is more difficult to make the connection because of the different etymology of the word waste, but if we think in French or Spanish it's more readily comprehensible: "desperder" or "perder" in Spanish; "perdre" in French. Both mean to waste and to lose. Waste is what is lost. Time (labor time) wasted, for instance, epitomizes this idea. Once gone, it's irrecoverable.*

*In "Rhythms of Wasting," I wanted to foreground this very notion. The capitalist mode of production inherently produces waste, not merely as tangible refuse but as misspent human effort and energy.*

**MH: When considering the technologies of today, we can't overlook the importance of minerals and energy used in their creation, and conversely, the electronic waste they generate when discarded. There's an argument that such waste might become a type of "future fossil", contributing to a layer of human-induced geological strata. As we discuss the Anthropocene era marked by human intervention, how do you envision the fossil layer that captures the essence of our technological age?**

*ML: Your inquiry touches on a multi-faceted issue. I have avoided using the term "fossil" to describe anything but fossil fuels. Indeed, I presented a paper more than a decade ago titled "Against Fossilism", which I never published, in which I took on the notion of "fossil capitalism", or "fossil capital" at a time when the phrase was in vogue. For me it somehow always implied that capitalism was already fossilized. Although capitalist production has since the 18th c. relied on fossil fuels, it involves various modes of extraction of various materials, like production in general.*

*In my paper "Rhythms of Wasting" the notion of the detritosphere becoming lithosphere approximates what you're calling "future fossil", a lithosphere that is produced and exists side*

*by side, so to speak, with the naturally occurring geological lithosphere. One of the major components of this produced lithosphere is what some scholars have called "urban ore" – materials furnished by the technosphere that could potentially be used as raw material again.*

*Here also we have to understand this concept in relation to capital's drive to transcend geological limits. Ideally, metals, a significant component of technological infrastructure, would circulate within society independent of geology, i.e. within circuits of production, refining, manufacturing, etc. detached from the lithosphere, i.e. without the necessary investments (of money, energy especially, and labor) in the extraction of traditional ores. Some European companies, especially those that have lost their colonial possessions, have been using so-called urban ore for decades, some have become entirely dependent on such ores as inputs into their smelters. The ideal conclusion would be a world where metal production is entirely reliant on waste streams. The practice is most advanced in Western Europe, but it's also gaining ground in the US and especially in China as the demand for metals increases and China's infrastructure and equipment become older and must be replaced, i.e. scrapped.*

*Some scholars of industrial ecology have argued that, in the case of some metals like copper, enough has already been extracted to circulate within society without geological constraints. The delirium of capital to close the material loop, as I have called it, is reflected in notions such as the circular economy and wasteless society. I have here to mention that my notion of the delirium of capital is inspired by Melinda Cooper who reminds us that delirium does not only represent the world but creates it. (Something like Deleuze and Guattari's notion of the desiring machine, which construes desire as productive activity which creates its object rather than become stimulated by it. This idea echoes the sentiments of the early Marx, where labor is not just about production but also encapsulates the essence of living activity. More can be said on this topic, but we're digressing) . The delirium in question here is the delirium of the desire of capital for a world in which its accumulation and self-reproduction is freed from geological constraints and natural limits.*

*It must be emphasized that these ideas and concepts concern metals and their position in the circulation of capital. They are not transhistorical, i.e. pertinent to all societies, or to "life", and they do not readily apply to other materials or things such as energy, for example. So, generalizations would be tricky, though translation is not entirely impossible.*

**MH: You mention landscapes of capitalism, modern ruins, and the relentless push for "false newness" in capitalist practices. It's interesting how this mirrors the recycling of cultural artifacts in popular culture, where everything seems to perpetually reinvent itself. This cycle of construction, destruction, and reconstruction, as we observe in urban**

**environments, appears to be a reflection of how cultural ideas and ideologies are perpetuated. Can you share your thoughts on this "false newness" that you've spoken about?**

*ML: Certainly. My understanding of "false newness" comes from my study of Sweezy and Baran's "Monopoly Capital", in the section in which they discuss the "sales effort" strategies of stimulating consumer demand in a society where monopoly capital is predominant. Here we are talking particularly about the post-World War II US economy that is plagued with a tendency toward overproduction, leading to crises due to increase in the surplus. Companies, commodity producers—of everything from durables like houses and cars to non-durable goods and services—face a challenge when people do not, or cannot, spend beyond their limited disposable income, so they must come up with ways to make people buy things, their things. (In recent times this problem has been partly resolved by personal debt, credit cards, etc.). One of those strategies involve planned obsolescence: companies manufacture commodities with a limited useful life and which are difficult, or impossible, or simply too expensive to repair. This one reason why the number of repair professionals is dwindling. Take smartphones, where old devices can't support new software updates, necessitating an upgrade. This coerced upgrade cycle is just one manifestation of this obsolescence strategy. Or things become prematurely obsolete because they become unfashionable, so another strategy is to create "false newness", superficial changes that are passed as improvements on the old product or innovations. It involves repackaging an old product with minor, often cosmetic, tweaks to make it seem new. A prime example is the car industry of the 50s and 60s, which pioneered the practice, whereby vehicles were essentially the same from one year to another but with different aesthetics to project novelty. This aligns with fashion trends, compelling consumers to replace items not because they're outdated or broken, but merely to stay current.*

*All these tactics are aimed at disposing of the surplus, to avert the crisis of capital accumulation. Corporations must continuously find ways to offload their surplus commodities, often through aggressive marketing or lucrative deals. But this is nearly impossible because of the tendency in capitalism for overproduction, including overproduction of the means of production: factories, machines, etc. Almost all capitalist industries produce below their capacities—the global car industry produces at around 80% of its full capacity, and even then there are more cars than can be sold. This is immediately evident if you drive on any highway in the US. Imagine if they were producing at full capacity!*

*Consumer goods have different market dynamics but follow the same broad logic. There is much more than people can buy because their wages do not reflect the value of the products they*

*produce (this is the kernel of Marx's theory of exploitation which also explains the inevitable crises in a capitalist society). What makes things worse for corporations under conditions of monopoly capital is that there is no real price competition between them.*

*Big-box stores in the US like Walmart, Target, etc. all price their products similarly. The real competition between corporations, not necessarily retail stores—those have the locational advantage of being closer to consumers—then lies in marketing strategies and making their products more enticing but not cheaper. The advertising industry is a testament to this competition for consumer disposable incomes, which in a way has also transformed the urban environment into one big advertising spread.*

*From the Marxian perspective on waste that I've been developing, advertising can be viewed as a wasteful industry because it's "unproductive" in the narrow sense of the term. But whether it's truly unproductive is debatable. No one seems to know what effect, if any, advertising has on increasing sales including advertising agencies.*

**MH: How does the concept of obsolescence, as influenced by societal norms, cultural shifts, and economic realities, relate to Marx's understanding of 'value'?**

*ML: Marketing, including advertising, undoubtedly speaks to our desires or, more to the point, creates new ones. Sometimes things become fashionable or unfashionable because of their association with certain societal norms and preferences, and those change with time rendering certain things more desirable but also rendering the symbolic meanings of other things inappropriate or undesirable. For instance, some products that progressive individuals now consider sexist or racist may still resonate with certain segments of society, not necessarily because of their controversial symbolism but because those items might evoke a sense of nostalgia or represent an era of bliss, safety, or dominance. Also here cars provide an interesting example, the contrast between people who proudly drive old gas-guzzling cars from the 1970s, perhaps retaining them as symbols of a bygone era of American prominence, and those who drive seemingly environmentally friendly vehicles. We must think that people who spend hefty sums on electric cars are serious and genuine about their concern for the environment, but they must also value some sense of individualism and individual responsibility rather than radical social change. The production of such cars, especially their batteries, is quite detrimental to the environment, including the bodies of the workers employed in the extraction of materials essential for their construction; nickel and lithium particularly.*

*While I recognize the profound influence of culture, advertising, and fashion in matters of obsolescence, hence wasting, I have kept my focus on the question of value, economic value in contrast with social and cultural 'values'. There is however, similarity here between the*

*economic and the anthropological approaches, to put it crudely: Objects, by their nature, don't inherently possess value, economic or symbolic. They come to represent values invested in them, or attributed to them, culturally or even personally. For me, the question on which I have centered my work on waste and mining has been the value reflected in commodities as products of socially determined labor.*

**MH: When we talk about our present, forcing us to reflect on the impact of our actions today on the future world, what is your critique of the current responses to climate change and ecological disasters? Specifically, could you share your insights on how effective these responses are, where they may be falling short, and the potential paths we could take to improve our strategies for dealing with these global crises?**

*ML: While I don't completely dismiss the concept of the Anthropocene, I believe it needs to be considered beyond the narrow scope of its formulation by physical scientists. The term "Capitalocene" is rather ineloquent. The academic discourse is saturated with terms that aren't always well-conceived. There are many problems with attempts to define geological eras by the predominance of capital or anthropos, the undifferentiated human, and one of them is that they disregard biophysical processes. I study microbes, and if you begin to understand their ubiquity and their essential contributions to the earth as a living planet you begin to understand that we inhabit a world, or rather worlds, of microbes, not the other way around.*

*When discussing the Anthropocene, it's essential to analyze the implications of placing humans, or humanity as some would have it, at the epicenter of geological changes. Though connected, the Anthropocene and climate change are distinct. The former is a broader term that some relate more to events like the atomic bomb than just fossil fuel use. Many people in the Global South already live in the dystopian future that climate scientists and others predict will fall upon us if we don't cut fossil fuel emissions. Indeed, numerous non-human species are already experiencing the apocalypse; extinction rates underscore the devastating impact that climate change has had on biodiversity.*

*There's a contradiction in the discourse: people talk about averting climate change while simultaneously acknowledging it may be already too late and that we must adapt to a new reality, but what kind of world are we trying to adapt to? Some people see climate change as a catalyst for social transformation, but we must acknowledge the challenges, the power that entities like oil companies, the states and militaries that protect their operations and the banks that fund them. We must also acknowledge the ongoing struggles of people living in places where extraction has wrought environmental disasters besides global warming, socio-ecological violence like oil spills, gas flaring, land degradation, assassinations, and environmental activists*

*in Africa and South and Central America who have lost their lives fighting for social and environmental justice.*

*There is no singular solution to the ongoing environmental crisis, or environmental crises: climate change is one of them but there's a host of other socio-ecological crises that solving the problems of climate change will not address; in fact some solutions to the climate crisis might exacerbate other socio-ecological problems (for example turning to alternative sources of energy; nuclear energy presents the problem of radioactive waste and nuclear fallout; dam construction displaces entire populations and submerges ancient monuments, etc.). The current discourse on climate change is overly focused on carbon emissions. In other words world ecological crises are often seen through a "carbon tunnel vision", which sidelines other environmental problems such as almost-perpetual oil spills across the world, wastewater disposal and pollution from hydraulic fracturing, dumping of toxic chemicals and other forms of pollution; population displacement; deforestation; soil erosion; biodiversity loss; and poverty and inequality—it is not often that we think about poverty and inequality in environmental terms but we must address those as forms of socio-ecological violence. Some of these problems are related, of course. Severe droughts in Africa and floods in South Asia have transformed millions of people into refugees. In places like the Amazon, communities grapple with the multiple threats of climate change, deforestation, and pollution from oil extraction—not to mention the violence of militaries and paramilitaries. Communities in some cities in the US are subjected to toxic dumping, lack of access to clean water, policing, etc. These are not only problems of communities in the so-called Global South.*

*People across the world are already living in the climate apocalypse, exacerbated by other modes of socio-ecological violence. But many communities are also engaged in everyday struggles, not only confronting entrenched power structures on a daily basis, but also devising, experimenting so to speak, with alternative modes of living, food production and distribution particularly because they have to. But also other forms of caring and sharing.*

**MH: In your opinion, how do localized resilience and community responses in times of crisis provide alternative perspectives and solutions in addressing the challenges of climate change and environmental disasters?**

*ML: Addressing the complex crises of climate change and socio-ecological disasters requires a multidimensional understanding, and more than one approach. There is more than one way out of the current predicament. One key perspective that often gets overlooked in mainstream discourses is what some people have called "diverse economies", economic practices in some communities that actively create alternatives to capitalist market exchange. (But also, we must*

*always emphasize that communities across the world have practiced diverse, or alternative economies, for centuries, without calling them so). Often driven by local needs and solutions, these practices can manifest in various forms, from localized sustainable agriculture to community-based energy solutions. Food production in particular is central to any solutions to the climate and other environmental crises. Apart from the fact that food is absolutely necessary for maintaining human and non-human animal life: the agro-industry is a major contributor to climate change, and a few corporations have a monopoly over agriculture and food production across the world. Disentangling food production from large-scale industrial models can pave the way for alternative, more viable food production systems that provide communities with some food security, and at the same time reduce the ecological footprint of food production.*

*A significant emphasis should be placed on observing and understanding how communities, especially in the global south, adapt and innovate in the face of adversity. For instance, in regions like Lebanon, which face a confluence of economic, political, and environmental challenges, people's resilience is evident in their daily lives. Even amidst scarcity and disaster, they find innovative ways to sustain themselves and their communities. This resilience isn't merely about survival; it's about forging new societal bonds and redefining communal relationships. Contrary to common belief, during times of crisis people do not resort to individualism, there are numerous instances where communities exhibit what I've called "spontaneous communism." In moments of crises, following disasters, e.g. the civil war in Lebanon or earthquakes in Mexico, certain societal norms are suspended and people adopt a communal spirit, caring for each other without expecting anything in return, looking after the collective well-being rather than individual gains. Some exploit these moments for personal gain, we should be cautious not to overly romanticize. Such behavior underscores the potential for alternative societal arrangements that lurks amongst us and materializes during crises.*

**MH: Some communities, especially from the Global South, are voicing their concerns and experiences about climate crises. Yet there's a challenge of these narratives being distorted, translated, or even eroded. How do you view the role of technology, media, and modern communication tools in both aiding and complicating these narratives?**

*ML: One of the problems that Hardt and Negri dealt with in *Empire*, published in 2000, was the simultaneity and multiplicity of challenges against the global empire of capital, so to speak. This is evident in the similarity between social struggles across the world, their common causes. But this question raises another: the translatability of social struggles from one place to another. Consider the parallels often drawn between the struggles of Palestinians against colonial occupation and the struggles of African Americans against a racist state. The parallel is often*

*drawn at the level of collaboration among the oppressors: Israeli military advising police departments in US cities, for example. The challenge lies not just in identifying these similarities, but in actually communicating them, establishing tangible connections between, say, indigenous people in the Amazon and the communities in Palestine we mentioned above. While they might, at some level, be waging similar struggles, how they wage those struggles, the methods and modes of organization can vary greatly.*

*The communicability, or translatability, of social struggles has benefited tremendously from technological developments in communication, especially for reasons of organization, even among activists or rebels in one place, for example in Arab cities during the uprisings of the Arab Spring. But, those technologies, including social media, have not themselves brought the social change they claim they did. It was not Facebook that caused the uprisings of the Arab Spring. Indeed, social media and other modes of modern communication can work to the opposite effect. I have in mind the software that governments can plant on journalists and activists' phones to track them and eventually imprison or assassinate them. I also think about all the misinformation and disinformation that can easily circulate through the multiple modes of communication. We heard in the 1990s, when the internet was still a novelty, that it would bring equality and democracy to people across the world. It hasn't. While it has facilitated some positive changes, it has also paved the way for opposite tendencies, like the rise of far-right ideologies and the return, so to speak, of fascism.*

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