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Tom Holert, Doreen Mende

Editorial: “Navigation Beyond Vision, Issue Two”

Our editorial for the first issue of “Navigation Beyond Vision” in June 2019 began: “Today one may complain that life has been reduced to points in a matrix of relations—cities, territories, and historical narratives prematurely refined into categories of known and unknown, real and virtual, concrete and abstract space.” At the time, we could not have imagined the mass migration into abstract space that would soon follow. Today, living through the planetary pandemic, the imperative to navigate the world and our own lives through computational tools has been radicalized to the extreme. The last months of Skyping, Zoom conferencing, and collaborative Google Docs writing make us feel we have no choice but to exhaust the planetary promise of navigational tools, refining remoteness into proximities, scaling the world of friends, colleagues, and family into the rectangular screens in front of our eyes. More than ever, a paradigm of navigation folds all social and economic activities into the domestic, the facial, the optical, demanding further reflection on the enmeshment of labor, exhaustion, and love into a techno-political website.

“Social distancing” in this context seems a double euphemism: First, for the constant interruption of face-to-face conversations by glitches, echoes, ventilation hum, or simply by headaches and sore eyes. And second, in echoing filmmaker and writer Harun Farocki’s “computer animation rules,” by using model worlds to rehearse actions in the world, social distancing becomes less of a social exercise than a technological mandate. Galleries and art institutions who still continue the high-modernist tradition may secretly rejoice when uploading exhibitions and programming to not only more cost-effective virtual platforms, but also into online spaces sanitized beyond the wildest dreams of any white cube. If before they struggled to sterilize spaces into bright white voids of absolute hypothesis and contemplation, an entire planet has now emerged from hiding, even more virtual and ripe for habitation, and with lighting already built into the screen.

Our impulse to engage with navigation departs, in the first place, from Harun Farocki: in the 1990s, he would develop the concept of “distance montage” (introduced by the filmmaker Artavazd Peleshyan) into the “soft montage,” where continuities between images are folded into one another. To Farocki, this conceptual-practical shift could acknowledge a “farewell to cinema” (Chris Marker) and the arrival of video games, video art, and video installation. Drawing on media theorist Alexander Galloway’s term “actionable objects,” Farocki embarked on understanding the actionability of a “ruling class of images” that produce the world through a performative relation (rather than simply reproducing a virtual world that is “highly artificial with millions of details”).

In early April 2019, the Harun Farocki Institut (HaFI) and e-flux embarked on this research path with “Navigation Beyond Vision,” a conference at the Haus der Kulturen der

Welt (HKW) in Berlin. Following this conference, we conclude that the principle of montage is not obsolete as a methodology and epistemology of the political image. While computational navigation continuously refreshes the image to sustain its infinite and exploitative tyranny of immersion, the principle of cinematic montage should stand as part of a continuous debate on how navigation alters the way images—and art—constitute models of political action and modes of political intervention. The seven contributions for this second issue of "Navigation Beyond Vision" aim to complicate and expand upon navigation's planetary technological promise.

In 1967–68, Farocki and his fellow students at the German Film and Television Academy Berlin (dffb) occupied their film school, renaming it "Dsiga Wertow Akademie." What would be an equivalent educational-political action for filmmaking students today? Perhaps they should follow the pedagogy of Neytiri te Tskaha Mo'at'ite of the Na'vi tribe of *Avatar* (2009), who teaches "the ways of the people" to travelers lost between distant bodies and distant worlds. The "Na'vi Academy" could become this student occupation of our screens. We still have 116 years to develop this further: the daughter of the Na'vi people was only born in 2136.

—Tom Holert, Doreen Mende, and the Editors

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Tom Holert is a researcher, writer, and curator. He is the co-founder of the Harun Farocki Institut in Berlin. He's currently organising the research and exhibition project *Education Shock. Learning, Politics, and Architecture in the 1960s and 1970s*, at Haus der Kulturen der Welt, Berlin (forthcoming September 2020).

Doreen Mende, curator and theorist, is currently professor for Curatorial Politics and head of the CCC Research-based Master and PhD-Forum at HEAD Genève/Switzerland. Recent curatorial projects include "Hamhung's Two Orphans" for Bauhaus Imaginista at Garage Museum of Contemporary Art in Moscow, 2018; "The Navigation Principle" at the Dutch Art Institute, 2017; "The Prisoner Letter" at Khalil Sakakini Cultural Center, Sharjah Biennial 13 Offsite in Ramallah, 2017. Since 2015 she has been a founding member of the Harun Farocki Institut in Berlin.

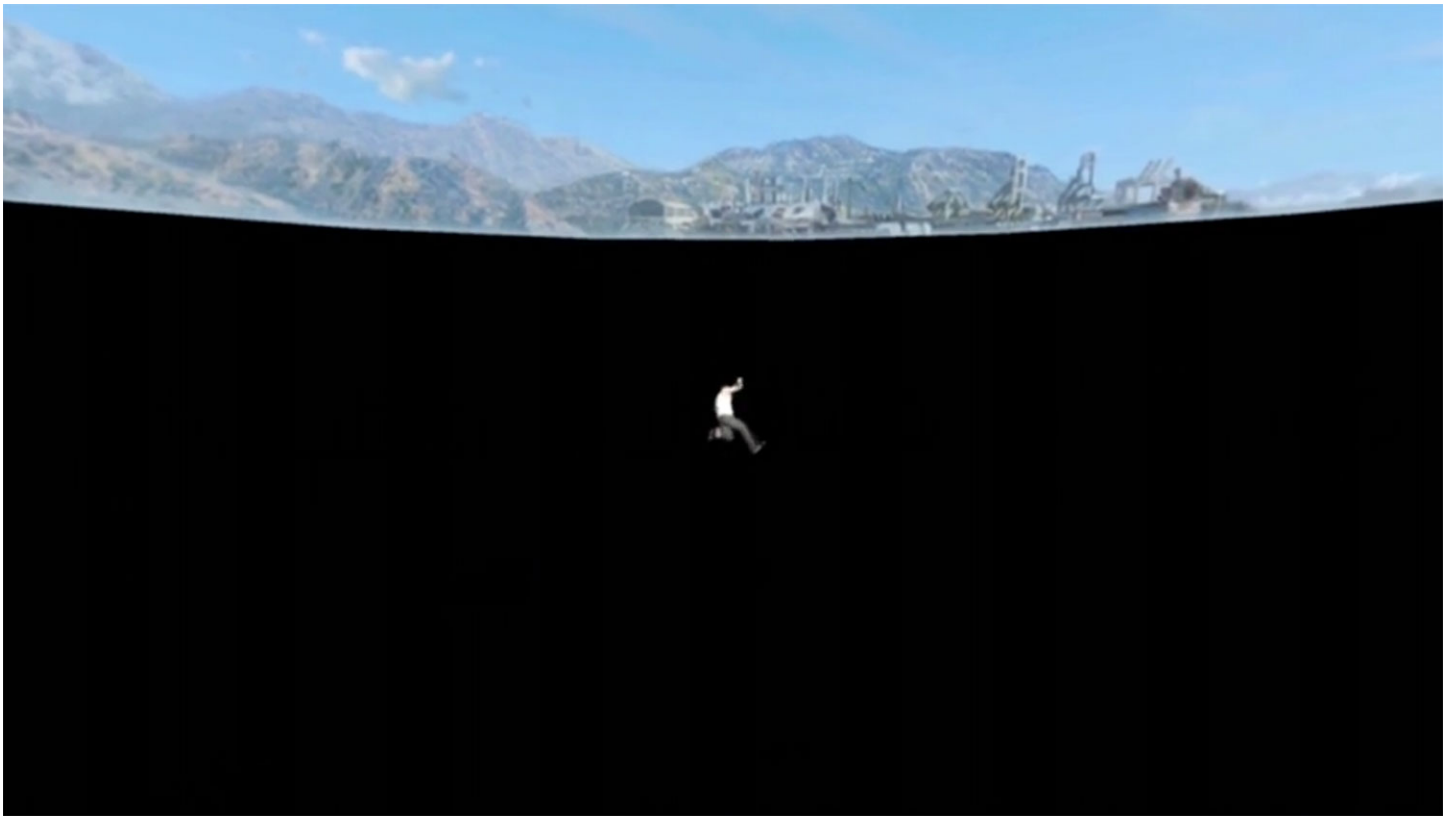
Kodwo Eshun

Recursion, Interrupted

Certain conferences operate as gatherings that aim to articulate the problematic, the predicament, and the promise of an inquiry whose urgency might not be immediate or apparent in its immediacy or its appearance. I believe that "Art after Culture: Navigation Beyond Vision" might be one such occasion. My role, accordingly, is to take stock of what has been proposed last night and today so as to offer a first draft of some but by no means all of the concepts, images, and figures of thoughts that populated the presentations at this event.[1] The question of navigation, which forms the raison d'etre for this conference, is popularly understood as a quotidian practice of movement within computational networks. As a gestural economy compelled by digital interfaces, the habitual activity of navigation tends to recede from critical scrutiny. To begin to comprehend navigation's historical ontology, phenomenal interfaciality, political imagination, and psychic life requires an effort of defamiliarization that begins by paying attention to this critical inattention. The peculiar elusiveness that thwarts the ambition to think through the worlds that navigation makes possible is not merely definitional; rather, it indicates the opacity of computational processes characterized by James Bridle under the portentous phrase "the New Dark Age." Bridle's *New Dark Age: Technology and the End of the Future* takes its title from the sentences embedded within the "papers of the late Francis Wayland Thurston, of Boston" that begins H. P. Lovecraft's 1926 weird fiction "The Call of Cthulhu":

> The most merciful thing in the world, I think, is the inability of the human mind to correlate all of its contents. We live on a placid island of ignorance in the midst of black seas of infinity. And it was not meant that we should voyage far. The sciences, each straining in its own direction, have hitherto harmed us little. But some day the piecing together of dissociated knowledge will open up such terrifying vistas of reality and of our frightful position therein that we shall either go mad from the revelation or flee from the deadly light into the peace and safety of a new dark age.[2]

If we adopt, for a moment, the dated terminology of Wilfrid Sellars's "Philosophy and the Scientific Image of Man," Lovecraft's cosmic fable could be said to envision the catastrophic impact of the "scientific image of man" upon man's "manifest image" of himself.[3] Instead of overcoming the dualism between the scientific and the manifest image by incorporating the latter into the former, as Sellars envisioned in 1960, today's scientific image of code/space "conditions" man's manifest image of his cognitive capacity. Orders of magnitudes of code/space bring man face to face with the limits of his cognition while depriving him of the capacity required to comprehend those limits. Bridle's new New Dark Age transposes the great, white, racist Rhode Islander's fanatical insistence



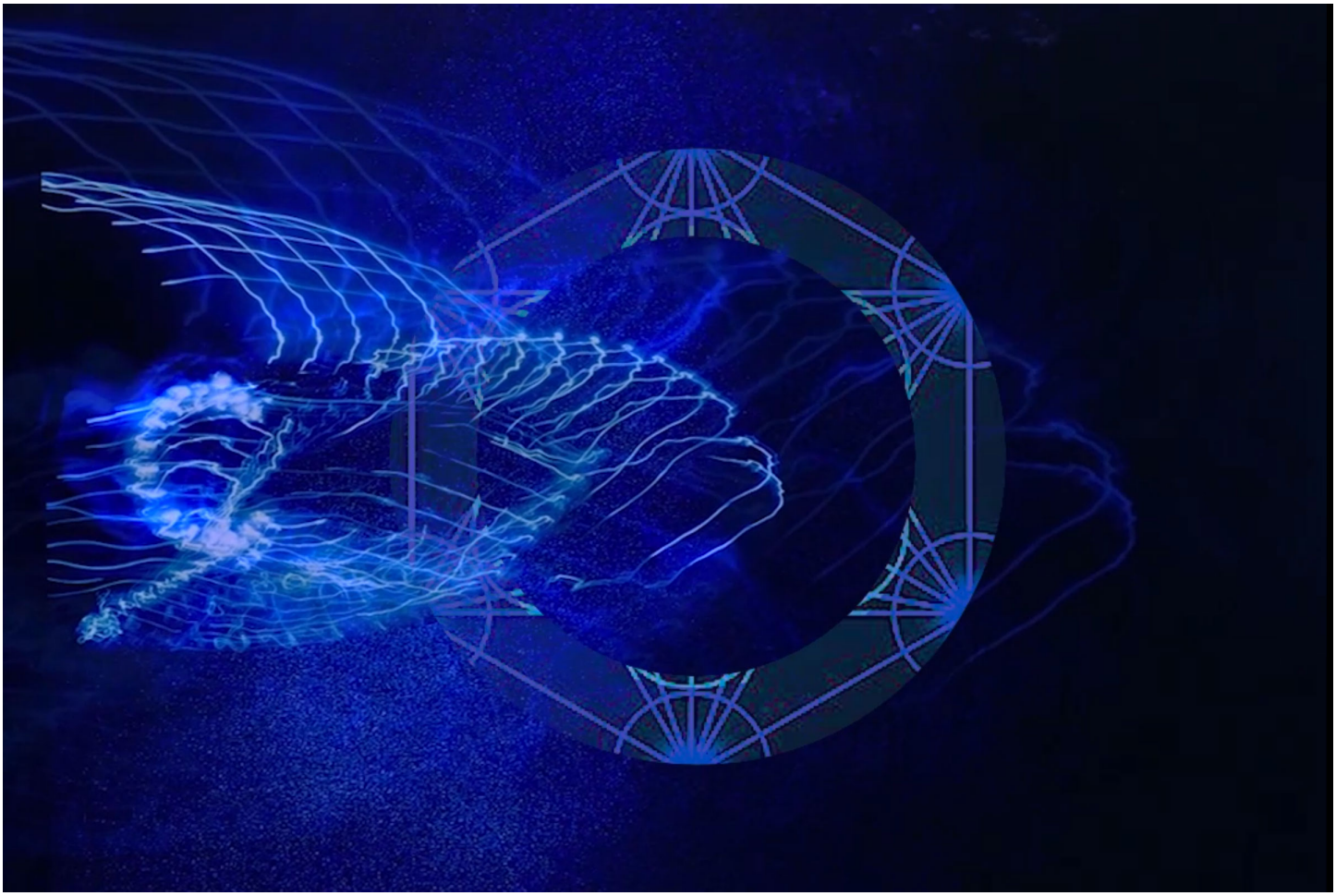
Harun Farocki (with Matthias Rajmann), Parallel II, 2014. HD video, 16:9, color, sound, 8:38 min (loop). Courtesy of Harun Farocki GbR, Berlin.

on scientific immoderation, infinite blackness, and anthropic finitude into a synoptic image of planetary computation's conditioning of comprehension:

> Like an air control system mistaking a flock of birds for a fleet of bombers, software is unable to distinguish between its model of the world and reality—and once conditioned neither are we. And this conditioning occurs for two reasons. Because the combination of an opacity and complexity renders much of the computational process illegible. And because computation itself is perceived to be politically and emotionally neutral. Computation is opaque. It takes place inside the machine, behind the screen, in remote buildings, within, as it were, a cloud, even when this capacity is penetrated by direct apprehension of code and data. It remains beyond the comprehension of most. This aggregation of complex systems in contemporary networked applications means that no single person ever sees the whole picture.[4]

In this picture of a whole in which no one is able to see the whole picture, Lovecraft's everted sublime provides a heightened symbolism for the effects of computational occultation. To live within the terms of the new New Dark Age is to find oneself subjected to Alexander Galloway's argument that the "point of unrepresentability" should be understood as the "point of power" that no longer resides in the image but today resides in networks, computers, algorithms, information, and data.[5] As Mahan Moalemi has recently suggested, the exponential rise in computational processes enlarges unrepresentability and simultaneously proliferates computational symbolism. The latter, however, does not amount to new representations of the world; rather, it introduces new entities that "act on the world" by bringing about processes or realizing functions. What Moalemi draws our attention to is the changing "background," if that is the right word, against which the "enduring presence and ongoing transformation of images and other representational devices require discussions around an ontology of vision and its manifold implications."[6]

This conference could be characterized as an effort to enable such discussions around the manifold implications of the ontology of vision. What animates these discussions is the ambition to augment Harun Farocki's artistic and critical project of visual literacy that dedicated itself to "making the invisible visible or a hidden truth tangible" according to an "epistemology of exposure" with devices for comprehending what Tung Hui Hu calls computation's capacity to mediate "between an abstract totality and the frame of human experience."[7] The concepts formulated during the conference aspire to articulate the scales at



Film still of Maité Chénière's video Sonikflux (2020), also in this issue. See →

which navigation mediates the optical image that frames human experience within the abstract totality of post-optical data. Each presentation sought to outline methods for scaling their object of analysis. For some presenters, navigation is affirmed as an interscalar method for analysis; for others, it is critiqued as an object or event of analysis; others adopt the former as an "interscalar vehicle," to use Gabrielle Hecht's term, for comprehending the latter.[8] These approaches can be understood as efforts to comprehend the gradient upon which computation subjects the "contours of experience" to what Moalemi astutely calls a "certain techno-ontological" status which looms within the "discontinuities and inconsistences" that emerge across the "different scales of being, and of being human." Taking account of these differentiations of being human requires situating the ontological disorientations of computational aesthetics within broader "processes of anthropogenesis" that locate the parameters of the "experiential within a human figure" and, in turn, define the specifications of the "human according to a particular mode of experience."[9] Moalemi's expansive insights into the shifting relationships between computation, experience, and anthropogenesis help to articulate the scale and the scope of this conference.

What is at stake in Maité Chénière's sonic manipulation of Sun Ra's project of transmolecularization, Oraib Toukan's formulation of the navigable field, Charles Heller's analysis of the architectural image complex, Patricia Reed's elaboration of the extra-local, Matteo Pasquinelli's outline of the three-thousand-year-old genealogy of the algorithm, Ramon Amaro's formulation of everyday duress, Jennifer Gabrys's outline of the becoming environmental of computation, Nikolay Smirnov's elaboration of the metageographical diagrammatics of the mapoid, Mariana Silva's reconfiguration of Elizabeth Povinelli's notion of geontopower, Laura Lo Presti's elaboration of the terraqueous, Anselm Franke's elaboration of magicalization as navigation, Tom Holert's account of navigation's differentiation from the visual, Kaye Cain-Nielsen's formulation of the notion of precision, Hito Steyerl's development of the temporal colonization of the night, which reminded me of three-thousand-year-old nightclubs, in caves, James Bridle's notion of automation bias, Doreen Mende's attention to the conceptualization of modelling worlds, and Brian Kuan Wood's account of the stakes entailed by Harun Farocki's notion of animation as

the ruling class of images?

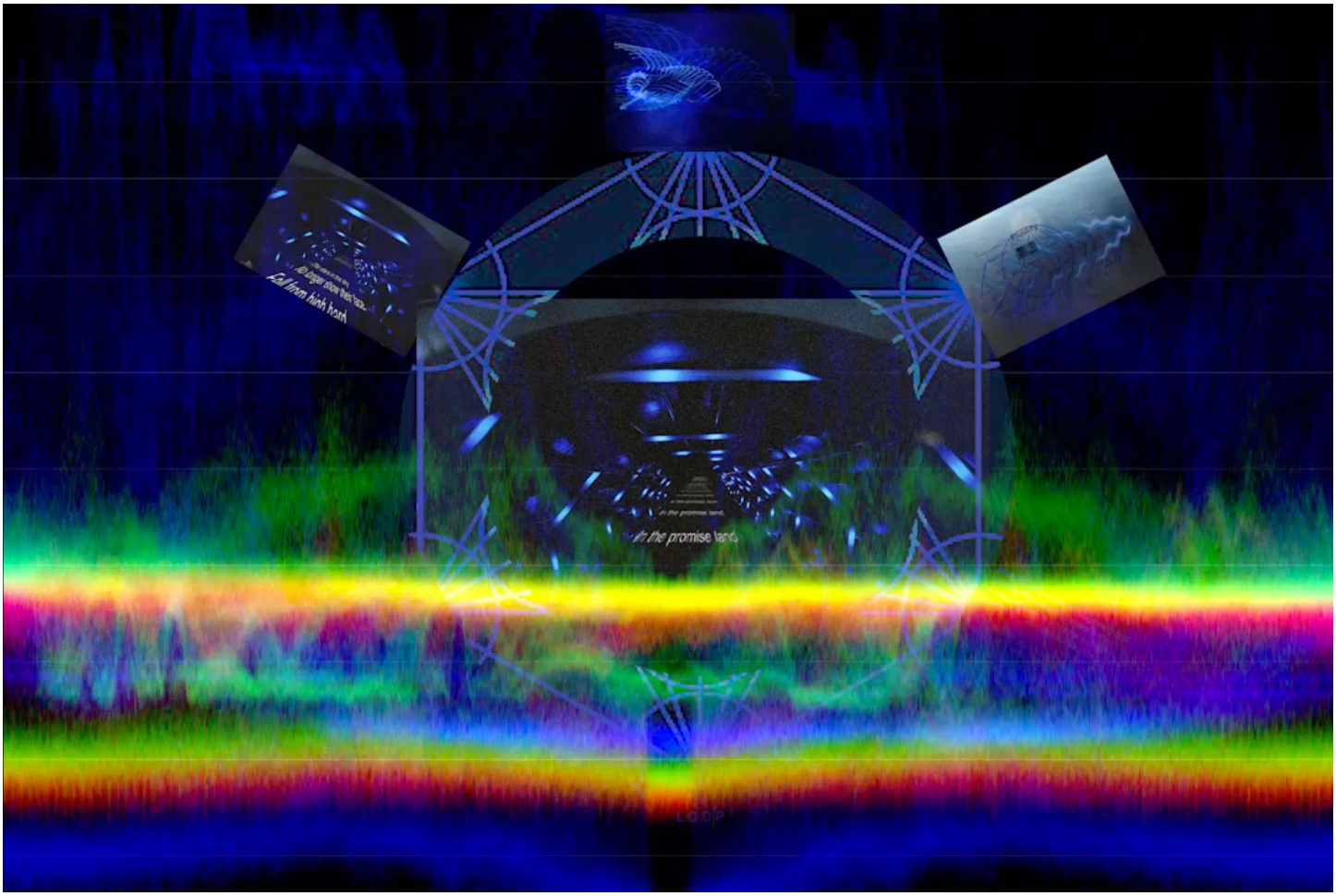
Certain moments within these presentations indicate tendential directions and divergent tendencies within the analytic frame of navigation. In the presentation by Charles Heller, navigation becomes a method for assembling images into a complex that makes the distributed scenes of compounded crime legible as a timeline. Against states and corporations that calculate degrees of liquid violence against the migrant praxis of fugitive navigation, Heller draws our attention to the architectural image complex around which counter-claims can be mobilized for political struggles. If Heller focused upon navigation as an investigative practice, the presentation of Patricia Reed, in contrast, sought to think through the theoretical ramifications of the concept of navigation. To grasp navigation as a process that transforms our self-understanding of what a "self" might be or what is entailed by the idea of "understanding," Reed asks what it means to be "grasped" by the concept of navigation. If navigation can be understood to entail the mediation between intention and the unknown, the movement of inclination and the construction of points of orientation, then how can navigation be understood? What happens when navigation is posited at the scale of the planet? For Reed, thinking with and through the concept of navigation requires committing oneself to the recursive implications of thought. How does the abstract or the "extra-local" concept of the planetary, to use Reed's concept, "work back on us"? Under what conditions do the planetary ramifications of navigation transform our self-understanding? How can we narrate the consequences of this commitment in meaningful ways?

To navigate the world in its complexity, argues Reed, presupposes the commitment to the work of making the world navigable. Such a labor not only presupposes the practice of location, as formulated by Homi Bhabha, or the practice of situatedness as elaborated by Donna Haraway.[10] It requires posing the question of the constitution of location at a planetary scale. Reed's enquiry turns on the aspiration to renew the thought of the local, the idea of locality, and the theorization of location by posing the question of the spatial ramifications of the extra-local. How the extra-local is to be understood, in its details and in its implications, is part of what Reed calls "making claims upon navigation as a political act."

If I focus on Reed's presentation, it is because Reed usefully shifts discussion away from preoccupation with visual literacy or visual ontology towards an understanding of navigation as recursion. Yuk Hui defines recursion as an act that "constantly refers to itself and evaluates itself."[11] Unfolding the reciprocal implications of navigation as it "works back upon us" requires an approach towards human experience in which the project of the "human" and the process of "experience" are continually revised by the recursivity of navigation. Reed implies but does not articulate the extent to which the theoretical potential of recursion operates at a different level to, and must be distinguished from, the algorithms of platform capitalist monopolies that recursively map and record navigation as data. Reed's perspective sets in motion a process that Eugene Thacker describes as "anthropic inversion," which is developed to its fullest extent in Reza Negarestani's elaboration of an "outside view" of the human species.[12] In his account of Reza Negarestani's *Intelligence and Spirit*, Robin Mackay characterizes Negarestani's theorization of philosophy as "a program of constructing an outside view of ourselves" that entails understanding how "changes in our self-conception" would "necessarily lead to the transformation of our collective modes of acting." From this perspective, Mackay suggests, philosophy and by extension aesthetics, indeed "all kinds of practices" could be understood as "already a program for artificialization, as a program for artificializing ourselves."[13]

In Reed's presentation, navigation participates in and contributes to Negarestani's reconfiguration of the project of artificial generalized intelligence, or AGI. Negarestani encourages an understanding of artificial general intelligence that exceeds the restricted definition of artificial intelligence as it is currently understood so as to envision AI beyond its capture by surveillance capitalism's ubiquitous platforms. Reed's philosophical program for navigation invites listeners to situate its meaning in the wider temporal frame implied by the planetary scale of the extra-local. This understanding of the time, space, past, and future of navigation extends beyond its digital present towards its proleptic potential and its historical archaeology. Matteo Pasquinelli's presentation responds to this effort by locating the practice of navigation within an overlooked genealogy of mathematical rule that decenters algorithmic governance's illusion of presentism by provincializing its capitalocentric perspective. In his compelling account of the ancient Vedic ritual of Agnicayana, Pasquinelli situates navigation within a three-thousand-year history of algorithmic rituals that organize time, space, labor, and social relations into practices of "self-computing space" that produce their own maps of their own navigation. This is not a matter of decolonizing navigation; rather, Pasquinelli is concerned to demonstrate that power's aspiration to control the time and space of populations and territory through ceremonies of computational space predates capitalism's dreams of machine learning, automating perception, and industrializing vision.

Nikolay Smirnov's presentation functioned as a window into the under-researched geopolitics of navigation. Smirnov's lecture returned to a forgotten episode from within the history of Communist navigation. In his focus on the so-called "cartoids" diagrammed by the Soviet "metageographer" Boris Rodoman throughout the 1970s and '80s, Smirnov demonstrates the ways in which a Communist aesthetic of sociography displaces Americocentric capitalism's habitual recourse to



Film still of Maité Chénière's video Sonikflux (2020), also in this issue. See →

autobiography. As Smirnov explicated the chromatic blocks that diagrammed Rodoman's life in its "seasons" of existence, his exegeses were greeted with scattered moments of audience laughter. Whatever contingent reasons there might be for this response, those stifled snickers suggest that what might have been unease was quickly suppressed and converted into the acceptable expression of laughter. In those fleeting moments, Smirnov's presentation, precisely because it spoke of the past life of an unknown Soviet geographer, confronted audiences with the capacity of the diagram to work back upon "us." Rodoman's diagrams of his own life subjected his everyday existence to algorithmic principles of depersonalization and desubjectivation. Those cartoids offered an outside view onto himself as a series of self-quantified chromatic patterns. Rodoman's experiment in artificialization brought the audience face to face with the prophetic presence of intermediated recursion. In that moment, protected by anonymity, a handful of disconcerted people interrupted, checked, converted, and conducted recursion's ramifications throughout the auditorium in the ambiguous shape and form of laughter.

Rodoman portrayed his life as a series of patterns generated by routines that organized his existence; these routines can be understood as instructions or algorithms that emerged from and contributed to the shape of his daily life. What they depict is life externalized from the perspective of its own algorithms. Everyday life, understood in this way, generates the algorithms that organize it; the practice of daily life can, in this sense, be said to be computational. To understand the implications of this perspective, however, requires an encounter with the presentation of Ramon Amaro. Amaro situated the work of algorithms within his childhood amidst the informally structured segregation of the United States. In doing so, Amaro initiated a profound expansion of what counts as computation. Amaro's question "What are the mechanisms of machine learning already at work within everyday life?" introduced the thought of what might be called the "computational quotidian." His question challenged the conference to understand the domestic economy of everyday life as an aggregate of instructions for machine learning.

The difference between machine and human learning, argues Yuk Hui, is "the feedback system that inscribes the former with a predefined telos" that is inconceivable for

the latter.[14] Amaro's question, however, speaks of human learning as inseparable from Hui's definition of machine learning. Life, in this formulation, operates as machine leaning. It is "judged to be good since it can arrive at the telos in the most effective way, that is, measured by execution time."[15] By locating the predefined telos of machine learning within everyday life, Amaro alludes to the ways in which execution time sets the measure of everyday life by creating the moral economy of an effective telos or end. Amaro's question conjures the duress engendered when the judgement of the good is measured by the predefined teleology of effectivity. By rendering the idea of machine learning indivisible from the labor of everyday life, Amaro's question indicates the extent to which the unmarked whiteness of critiques that restrict themselves to media archaeology or visual ontology foreclose a reckoning with racially differentiated forms of duress generated in and by the gendered practices of everyday life once it is understood as a compounded, computational process.

Reflecting upon his life spent in his mother's household, Amaro states that "everything is preempted, and this preemption is based on duress." Life is inseparable from the temporality of preemption defined by Brian Massumi as the "futurity of unspecified threat" that is "affectively held in the present so that a movement of actualization may be triggered that is not only self-propelling but also effectively, indefinitely, ontologically productive."[16] Everything that is life, understood from this perspective, anticipates this unspecified threat in the present. In this account of living with and under the indefinite threat of an indeterminate future, Amaro shifted the primacy of preemption from Massumi's account of the Bush regime's foreign policy in which the "most effective way to fight an unspecified threat is to actively contribute to producing it,"[17] towards an account of maternally imbricated forms of daily life that sustained themselves within the compounded duress from which they emerge and in which they participated.

What emerges from Amaro's presentation is an intervention into the understanding of navigation's ongoing preconditions. Amaro's question "What are the mechanisms of machine learning already at work within everyday life?" redirects our attention to the question posed by Hito Steyerl in the conference's opening presentation—"How does one navigate time?"—by reconfiguring what counts as navigation and what amounts to time. Rethinking the ongoing duress of the mechanisms of machine learning at work within everyday life allows us to return, finally, to the questions addressed to the conference's participants by its organizers in their opening statement.

Doreen Mende and Tom Holert asked us to consider that "if navigation puts ontological pressure on the static frame of a photographic or cinematic image, then how are concepts of political action, visual literacy, and collective intervention also pressured to surpass or perform model worlds?" What this question alludes to is the ontological trouble that navigation makes for the frame of photography, the image of cinema, the conceptualization of the political, the action of the political, the visuality of literacy, the collectivity of intervention, the pressure to surpass, the capacity to perform, and the modelling of a world. With Amaro's question in mind, what I hear, now, is the compounded instability at work in each of these terms; how each term is an unstable compound. Mende and Holert transport these frail entities into their next question: "Has navigation ever been a visual technology at all, or has it always compounded cosmological, mathematical, and sensorial orders of magnitude into aggregate spatial orders that surpass the visual entirely?"

What this question invokes is a scene in which the pressurized predicates initially assembled in the preceding question have subsequently combined forces to undermine the assumption that navigation was ever exclusively visual or a question of technology. Without these presuppositions, navigation appears instead as a kind of Leviathan composed of cosmological, mathematical, and sensorial forces that amass themselves to the power of ten so as to occupy an inordinate space. Between the ontological insecurities assembled in Mende and Holert's initial question, the forces stabilized in their second question, the call for a politics of temporalization in Steyerl's question, and the understanding of the unspecified threat of machine learning formulated in Amaro's question stand navigation's avatars of unrepresentablity, code/space, symbolization, recursion, ramification, revision, and ritual ordered in magnitudes of compounded, aggravated duress.

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1
"Recursion, Interrupted" is a reworked version of the closing presentation delivered at the conference "Art after Culture: Navigation Beyond Vision" at Haus der Kulturen der Welt on Saturday, April 6, 2019. As such, it is marked by the effort to do justice to that occasion from the present moment of life lived under lockdown in the third month of coronacapitalism. If pandemicapitalism appeared, in its first weeks, to simultaneously exaggerate all preexisting fascist, anti-capitalist, nationalist, anarchist and, post-capitalist tendencies, thereby generating a political ambiguity to be opportunistically exploited by the entrepreneurs of the alt-right, today, however, its exponential death count disambiguates any such categorical confusion. What the mortality count makes clear is the extent to which the political regimes operative within the UK, the US, and Germany, to name the three polities with which I am familiar, sentence racially differentiated working classes to risk, condemn them to death, and consign them to immiseration at the same time as networked media assuages, alleviates, emolliates, and lubricates the passage of fascist, anti-statist values, wishes, fantasies, norms, rules, and laws.

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Negarestani and Robin Mackay, "Reengineering Philosophy."

14
Hui, Hui *, Recursivity and Contingency* , 125.

15
Hui, Hui *, Recursivity and Contingency* , 125.

16
Brian Massumi, "Potential Politics and the Primacy of Preemption," *Theory & Event* 10, no. 2 (2007).

17
Massumi, "Potential Politics and the Primacy of Preemption."

Mariana Silva

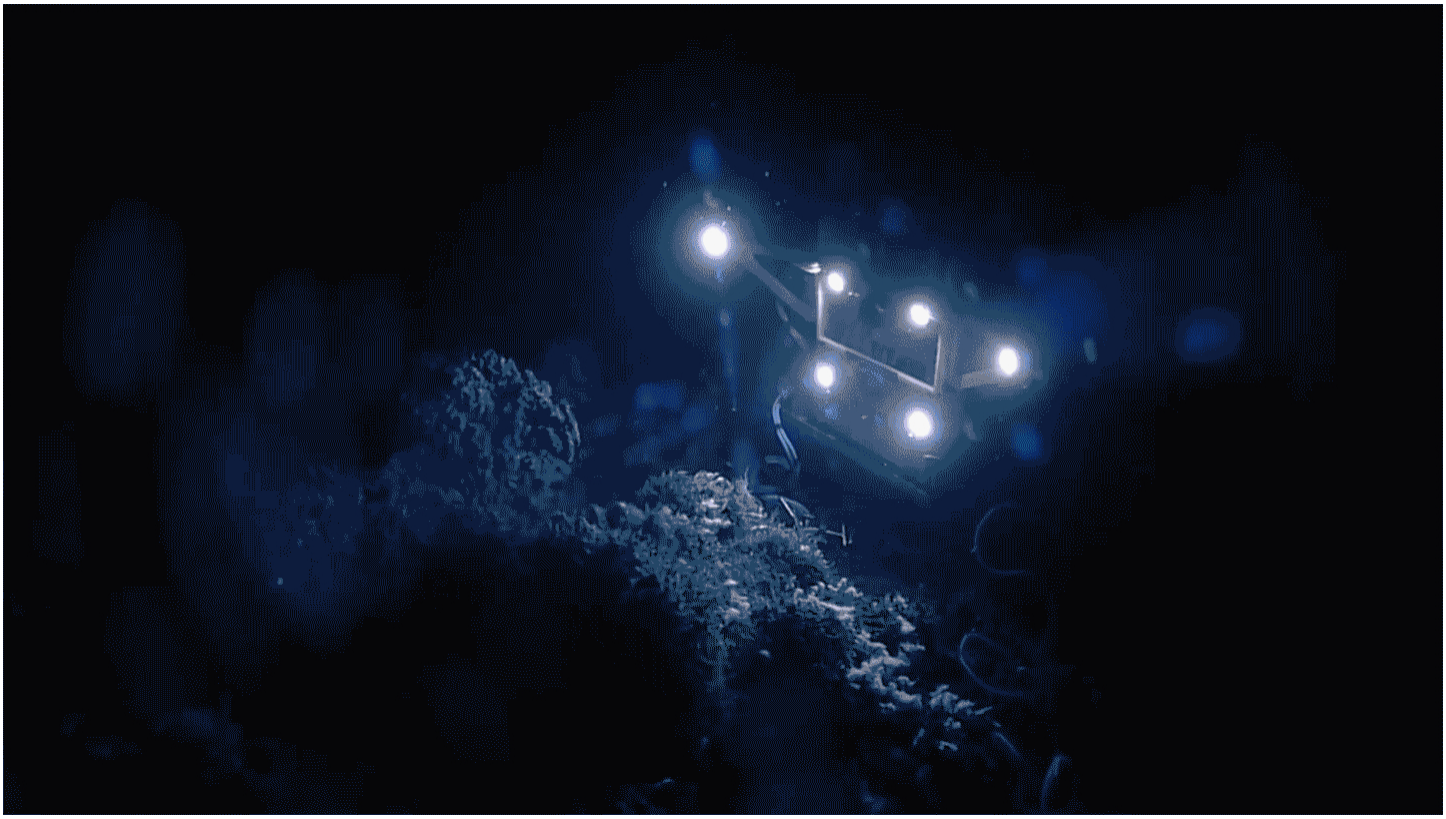
Mining the Deep Sea

Later this year, a new legal code that regulates seabed mining in international waters will be adopted by 167 countries. Issued by the International Seabed Authority, a United Nations organization, this code will regulate the exploitation of minerals such as manganese, cobalt, gold, copper, iron, and other rare earth elements for commercial purposes. It follows thiry previous agreements on prospective exploration with which countries have been allowed to survey their allocated territory to take stock of potential mineral riches, covering 1.3 million square kilometers of the ocean floor.[1] Until now, companies and states have only been able to survey and explore the territories they lease, but this new provision paves the way for future forms of commercial extraction.

The prospect of mining the ocean seabed in the high seas is just that for now: a prospect. But the developments of deep sea mining in the coming years might be an exemplary case of what happens on the eve of the opening of a new capitalist frontier to sustain the mineral commodity market, which has been growing for the past two decades. Once the 2020 mining code goes into effect, it is very possible that a deep sea mining industry may snap into place across national and international waters, since the international mining code will likely serve as a template that nation-states can adapt within their own territorial waters. For over a decade, certain countries have been strategizing to insure they are geopolitically well positioned when the mining code finally comes into effect.[2]

Ultimately, whether an underwater industry will bloom will depend on a few other favorable variables such as: bigger market demand and consistent rise in mineral prices; on-land scarcity or geopolitical tensions preventing access to resources; viable and cost-efficient extraction and processing technology; favorable national legislation; interest from the scientific community in accessing mining sites for research purposes; and a lack of opposition from civil society at the national and international levels. Calls for a ten-year moratorium on mining have been made by many environmental NGOs, the European Parliament, and more recently the Pacific island-states of Fiji and Vanuatu, after the disastrous bankruptcy of a high-stakes concession that left Papua New Guinea $125 million in debt.[3] Determining cross-national forms of protesting deep sea mining in national and international waters might be informative for future climate protests and blockades, where, as is the case with deep sea mining, resistance cannot happen on-site.

The Pacific, Atlantic, Arctic, and Indian oceans share common geomorphologies, shaped by spreading ridges and convergent plate boundaries. These contain three types of geological sites set to be mined. The first are massive sulfide deposits located in hydrothermal vents that result from the thermal and chemical reactions of underwater volcanic activity. The second are cobalt-rich ferromanganese crusts deposited around volcanic



configurations such as seamounts, ridges, and plateaus. The third are tennis-ball-shaped polymetallic nodules located in various geomorphologies. These comprise the main geological formations in international waters targeted for exploration in the Mid-Atlantic Ridge and the Clarion Clipperton Zone (Pacific Ocean) and in the national waters of Papua New Guinea, Fiji, Tonga, New Zealand, Japan, and the Portuguese Azores archipelago.

This text is born from many conversations and collective research conducted by Pedro Neves Marques, Margarida Mendes, and myself—operating collectively as Inhabitants—over a two-year period while developing an ongoing web series titled *What is Deep Sea Mining?*, which seeks to address some of our main concerns with the practice. This essay responds to some of the pro–deep sea mining arguments we've had to contend with and some anti–deep sea mining arguments that are circulating. It asks whether foregrounding the history of biology and geology can help question the discussions that extractive capitalism will attempt to mobilize. It tries to contextualize how these discussions operate within recent developments of biopower under capitalism.

Microscopic Mythologies

In 1977, scientists onboard the American submersible *Alvin* encountered what they called "black smokers," or hydrothermal vents off the coast of the Galápagos. At the time it was the first recorded encounter with hydrothermal vents, and they could not have predicted the parallels between their own discovery and Charles Darwin's famous Galápagos discoveries of the 1830s. The towering volcanic vents resemble chimneys that can rise to forty-five meters high. They are the result of the precipitation of magma-heated minerals in the high pressure of the cold ocean environment. To the scientists' surprise, despite the fact that these environments can reach temperatures of up to 400 degrees Celsius, unique ecosystems with mollusks, gastropods, tube-dwelling worms, sea anemones, and crustaceans could be found in them. Even more surprisingly, scientists were soon to find that at the nutritional basis of this food chain were microorganisms that use hydrogen sulphide as energy in a process called chemosynthesis.[4]

The Galápagos Islands were visited by Darwin in 1835 and have been credited as the site where the British naturalist first realized that species might evolve—mutate in time and space across island geographies. The 1859 publication of *On the Origin of Species by Means of Natural Selection* inaugurated a genealogical focus on evolution, based on an evolutionary tree branching from the principal cellular life-forms of bacteria and eukaryota. Knowledge of hydrothermal vents has contributed to the discovery of a third domain of microbial life to populate the Darwinian tree: archaea. Scientists have claimed that

> [there] are striking parallels between the chemistry of the H(2)-CO(2) redox couple that is present in

> hydrothermal systems and the core energy metabolic reactions of some modern prokaryotic autotrophs. The biochemistry of these autotrophs might, in turn, harbour clues about the kinds of reactions that initiated the chemistry of life. Hydrothermal vents thus unite microbiology and geology to breathe new life into research into one of biology's most important questions: what is at the origin of life?[5]

As narrated by anthropologist Stefan Helmreich, Darwisnism's genealogical predilection was taken up by genetics, the study of DNA and its cellular reproduction, throughout the twentieth century. This was undertaken firstly through the rewriting of the evolutionary tree based on phylogenetics, then through the analysis of ribosomal RNA (rRNA) genes. It is through analysis of ribosomal RNA that scientists have arrived at the belief that archaea are—as their name suggests—archaic beings that predate other single-celled life-forms.[6] Yet, archaea also exhibit lateral or horizontal gene transfer, which is the "nonsexual transmission of genetic material between unrelated genomes [and] across species boundaries," is estimated to account for a percentage of archaea's genomes.[7] Some scientists claim this process may undermine current research into a last common ancestor in order to find "what is at the origin of life." Horizontal gene transfer complicates phylogenetics and genealogical readings of genetics that have emphasized vertical reproduction—the passing down of genes instead of a sideways transmission. Ultimately, the identification of horizontal gene transfer is currently making the assessment of genetic ancestry more difficult and undermining the very representation of evolutionary trees, which have been a benchmark since Darwin.

Bioprospecting is the search for living species that may contain pharmaceutical or otherwise commercially valuable chemical compounds. Less than two decades after hydrothermal vents were discovered, a DNA polymerase isolated from the bioprospected archael hyperthermophile of the *Pyrococcus* genus was put on sale as the DeepVent® enzyme.[8] DeepVent® started to be used in gene amplification, "since enzymes from [hyperthermophilic] creatures can be used to make biochemical reactions run hotter and faster." It is also applied in molecular biology laboratories in polymerase chain reactions (PCR) to facilitate the copying of DNA.[9] Today, PCR is used in genetic testing for the analysis of ancient samples of DNA and the identification of infectious agents, with broader biomedical and criminal forensic applications.[10] In 1995, *Methanococcus jannaschii,* a protein found in many single-celled archea that thrive in the extremely hot hydrothermal vents, became the third genome to ever be sequenced and revealed a capacity to withstand temperatures around which most proteins "denature." Perhaps these discoveries provide a contemporary version of a Jules Verne tale: DeepVent® polymerase, a patented enzyme from the deep sea, provides the medium for cutting-edge technology and genetic research; *Methanococcus jannaschii* reveals "alien" genes previously unknown to scientists.

In the West, exploration of the deep sea has historically conjured images of ancient monstrous mythological creatures such as the Leviathan, the Kraken, and more recently the Cthulhu, among other figures of alterity and the unknown. Characterized by scientists and mainstream media alike for being "utterly alien," newly discovered undersea life-forms are no longer gigantic, but microbial. Descriptions often mix in themes of outer space exploration in the evocation of the "alien" and the technical challenges of building robotics to withstand extreme underwater pressure conditions. Perhaps the recent reconception of evolutionary trees prompted by underwater hydrothermal vents, over a century after the initial Western exploration of the Galápagos, contributes to a particular form of modern mythology—a science-led search for a last common ancestor of sorts fueled by biogenetic labs.

On the other hand, while hydrothermal vents are numerously located at the spreading ridges and convergent plate boundaries of the mid-oceanic ridge systems in the Pacific, Atlantic, Arctic, and Indian oceans, only about ten percent of deep-ridge habitats have been studied. Therefore, the consequences of deep sea mining on the environments they will exploit are vastly unknown and difficult to assess. This is because it is hard to calculate the consequences of the toxic debris expelled by potential vessels involved in deep sea mining and how the debris might spread through ocean currents. Furthermore, the metabolisms of deep sea organisms are notoriously slow and it is unknown how they might react to this new type of debris and the scale at which it might occur. Finally, baseline assessments are hard to confidently conclude amidst ocean acidification and climate change, when so many of these relations require further study themselves.

Underwater Geontopower

In 2004, New Zealand issued the Foreshore and Seabed Act, which allowed for the Trans-Tasman Resources company to legally propose a seabed mine that would seek to extract 50 million tons of seabed to exploit iron and titanium magnate.[11] This led to a fifteen-year campaign that culminated in a legal challenge brought against New Zealand's Environmental Protection Agency (EPA) by diverse groups such as Kiwis Against Seabed Mining, Greenpeace, the Māori tribes Ngāti Ruanui and Ngā Rauru, the environmental organization Forest and Bird, commercial fishing organizations, and the Taranaki-Whanganui Conservation Board. In the final ruling issued in early 2020, New Zealand's EPA was

required to consider the "full range of customary rights, interests and activities identified by Māori as being affected by the TTR proposal."[12] Although the situtation pertains to areas in shallow waters off the coast and thus is not technically deep sea mining, for geographer Katherine G. Sammler it highlights how "the very division of territory and property along a land/sea binary" common both to the Crown and ocean law brings to the fore complex ontological discussions relevant to the deep sea. Sammler writes that "unlike western models of property, Māori relationship to the land is ontological, so that one's sovereignty is formed out of a genealogical relationship to the land, sea, and to nonhuman species."[13]

Anthropologist Elizabeth Povinelli's concept of "geontopower" can help frame current extractive practices of states and corporations, including the ontological implications of mining the seabed.[14] The concept of geontopower identifies the entanglement between nature and history that originated in the early nineteenth century, with the disciplinary distinction between geology and biology that had formed just prior to the emergence of Darwin's ideas. Geontopower is distinct from the concept of biopower, under which it nonetheless operates, because it is not only concerned with life and death as objects of governance, but with the governance of the distinction between life and nonlife itself. Beyond Foucault's characterization of the historical passage of sovereignty from the "right to kill and let live" to "the power of making live and letting die," for Povinelli, geontopower exists rather as: "live, let die, *and kill.*"[15]

In what Povinelli characterizes as Western "biontologies," the dichotomy of life and nonlife tends to aggregate other dichotomies such as biology and geology, biochemistry and geochemistry, ecosystem science and the weather. This opposition originates in the understanding in modern metaphysics that "being" presupposes "life." For some non-Western cosmologies, however, the distinction between life and nonlife is organized according to other concepts and relations, such as the animate and the inanimate, the lively and the inert. Western biontology is, by comparison, "the cramped space in which my Indigenous colleagues are forced to maneuver as they attempt to keep relevant their critical analytics and practices of existence … [It] is not a concept first and an application to my friends' worlds second, but a concept that emerges from what late liberal governance looks like from this cramped space."[16]

While the power to demarcate life and nonlife has greatly contributed to the expansion of colonial and settler-colonial regimes in the past, it may be coming further into the foreground now, as capitalism requires new spatial fixes. The vast area of the underwater mines that may result from deep sea mining could be an example. The neo-mercantilism that obliges a state to sponsor a corporation in order for the latter to obtain the International Seabed Authority's concession in international waters is another such potential example,[17] as well as the microscopic frontier of value extraction brought forth by the biotech lab.

Geontopower thus guarantees that a statement such as "'clearly, *x* humans are more important than *y* rocks' continues to be made, persuade, stop political discourse."[18] This is not because rocks should be saved over humans, but because, in enforcing the distinction between life (*x* humans) and nonlife (*y* rocks), geontopower denies *both* non-Western ontological distinctions between life and nonlife *and* relations of interdependency—those identified by Western biontology or not. Utilitarian political and corporate arguments such as "clearly, *x* humans are more important than *y* rocks or *z* fauna" appear not only at sites of indigenous struggles against extraction, although these have played an important part in anti–seabed mining resistance movements, such as the Māori struggle against seabed mining off the coast of New Zealand, or the struggle of the Alliance of Solwara Warriors in Papua New Guinea. As Sammler characterizes it, geontopower "applied to ocean spaces and resources, [enacts] divisions [that] are employed to categorically enclose land (*geos*) from sea (*hydros*), human (*anthropos*) from animal (*zoe*), and surface seas (*pelago*) from deep ocean (*abbyso*) and seafloor (*bathy*)."[19]

Thus geontological conflict is what is at stake when pro-mining agents lay claim to the seemingly barren abyssal plains where polymetallic nodules are deposited, as if the apparent emptiness were *terra nullius* and indicative of a lack of life.[20] And yet, despite being historically inaccessible to humans, any "barrenness" of this land has been produced by the effects of human intervention on the earth's surface. Consider the eighteenth- and nineteenth-century whaling practices that caused the extinction of different whale species and decreased the number of whale corpses that sink to the deep sea, creating important deep sea ecosystems from their remains. Or consider the accumulation of trash and pollution on the seabed in the last century. Only a narrow vision of ecosystems allows for descriptions of ferro-manganese nodules as "potatoes" fit for harvesting, which suggests that their removal would have little to no consequences. In fact, more sessile and mobile fauna live on or near these nodules than in nodule-free areas of the same region, suggesting that the nodules are crucial to these creatures' survival.[21] Despite the nodules' potato shape, the harvest metaphor obscures the fact that the rocks required millennia to form. Hydrothermal vents, for their part, were initially heralded as a "greener" site of extraction in comparison to seamounts and polymetallic deposits, due to the reduced total area they occupy worldwide, estimated at only 50 square kilometers in total.[22] Yet many scientists have come to the defense of the unique endemic species that each individual active vent harbors. In turn, mining companies now draw the line between active and inactive vents on the basis that the former sustain more life than the latter, a fact that remains

questionable, given the impossibility of clearly separating the bacterial, chemical, and geological in sites such as these.

Biotech of Nonlife

Harvesting organic samples for biotechnological profit is potentially less invasive to undersea habitats and might generate revenue comparable to that of mining operation on the same site.[23] Therefore it might be tempting to oppose the mining industry to the less invasive approaches of the biotech industry as a way to compare different forms of ocean value extraction by pitting one industry against the other and pointing to the "lesser evil." The logic of a "lesser evil" is a pervasive greenwashing strategy used by the mining industry, which often compares the labor conditions of on-land mines and conflict minerals to the potentially less harmful offshore conditions of extraction atop a vessel performing extraction remotely.

While the "lesser evil" argument is perhaps useful in advocating for a deep sea mining moratorium, it perpetuates an all-too-neat set of equations: the assumption that economic comparisons between the market values of deep sea mining and deep sea biotech will foreclose one of them; and the implicit opposition between *bios* and *geos,* disregarding the porousness and interdependence of the two. Economic comparisons obfuscate the simple fact that there is no international mechanism in place, legal or otherwise, that allows one form of mining to happen at the expense of another. Because of this, in all likelihood, inaugurating an underwater mining industry would simply add to other on-land extraction sites perpetrated by other companies across the world. As is known from the frontlines of the climate crisis, capitalism, even more so at a global scale, is notoriously bad at shutting down profitable industries and divesting in futures that would require them to "dis-innovate, and dis-incubate" in favor of ecology.[24]

According to Stefan Helmreich's reading of philosopher Giorgio Agamben, horizontal gene transfer used in gene editing could be the basis of a new figure of *transfer* in the emerging molecular biopolitics of biotech. In his characterization of modern biopolitics, Agamben takes up the Aristotelian dichotomy between *bios* and *zoë* —biological "life-forms" and social "forms of life." In Agamben's reading, the terms operate according to a more complex distinction than that of human versus nonhuman, or nature versus culture. Rather, they differentiate between "the form or way of living proper to an individual or a group" (*bios*) and "the simple fact of living," also called bare life (*zoë*).[25] For Helmreich, transfer succeeds sex in Foucault's biopolitical structure, characterizing the micro-biopolitics that makes "elements associated with living things—genes, proteins, tissues—mobile, transferable across locations and organisms," and allowing "new biopolitical links—between persons and patents, polymorphisms and politics—[to] be forged."[26] The figure of transfer creates an "informatically inflected bare life that is increasingly agenealogical, molecular, and modular," whose growth and reproduction is increasingly available to be governed by *bios,* allowing for the market of patented genes to emerge.[27] In short, in order for a biotech lab to patent life from *bios* it must perform a new kind of separation of *bios* and *zoë,* one allowed by genetic technology but also by a legal system and commodity market ready to recognize this new form of extracting value from life and designate the patented gene fragment as nonlife.

The discussion as to whether biotech and mineral extraction will invalidate each other is ongoing. They may be neither opposed nor competitors. Consider, for example, a hypothetical future scenario in which a hydrothermal vent is bioprospected before it is mined for minerals. Bioprospecting may not require the continuous sourcing of a given gene, since once a first sample is extracted it can, in theory, be sequenced and replicated in a lab. Insofar as genetic prospection does not need to maintain life once it is synthesized, it could—again, hypothetically—be followed by other forms of extraction, leading to the deaths of particular animals and the extinction of the endogenous species harbored by a single hydrothermal vent. That is, the synthetic form of commoditized genes may not be incompatible with species extinction; it may exist in a space that is, under geontology, not beyond life and death, but rather between life and nonlife. That is, it is no longer just "the drama of life and death, but a form of death that begins and ends in Nonlife—namely the extinction of humans, biological life, and, as it is often put, the planet itself."[28] Furthermore, given that extremophile organisms often generate energy from the toxic mineral *geos* of their surrounding vent ecosystems, a tentative question arises: Could biotech's geontological frontier accomplish extracting "bare life" not from "a form of life" but from "a form of nonlife"? And could potential mining locations such as hydrothermal vents be such sites where geontopower manages to "live, let die, *and kill*"?

Deep Time in the Anthropocene

> The exploitation of the [industrial and pre-industrial] coalfields also uncovered large stratified fossil beds that helped spur the foundation of modern geologic chronology: the earth as a set of stratified levels of being and time. The concept of the Anthropocene is as much a product of the coalfields as an analysis of their formation insofar as the fossils within the coalfields helped produce and secure the modern discipline of geology and by contrast biology. But even as the coalfields helped create the modern disciplines of biology and geology, the carbon bomb it set off also

> slowly and then seemingly suddenly made these disciplinary distinctions differences of a different sort.[29]

Part of geontology's power may lie in its entanglement of the traditionally distinct disciplines of geology and biology—one which is pertinent if hydrothermal vents are proven to be at the origin of life on earth. In *Bursting the Limits of Time*, historian of geology Martin J. S. Rudwick narrates the early nineteenth-century emergence of the discipline of geology from the combined knowledges of science (minerology, physical geography, geognosy) and the late-mercantile or proto-industrial crafts required to mine coal, kaolin, and gypsum (to power steam engines, and to fabricate porcelain and plaster, respectively).[30] The integration of the three-dimensional visual rendering of maps used by the mining industry into scientific studies, as well as the geological specificities of the mining sites themselves, allowed for three-dimensional spatial representation (where drawings represented geological formations within a *x*, *y*, and *z* axis) of underground strata. Parallel to this, as a result of the French Revolution and the increasingly popular practice of chronology, the discipline of history became progressively conceptualized as a linear succession of events and crises. Geology was influenced by this fact and incorporated this newfound temporality. The earth began to be thought of as subject to contingent events and crises.

Rudwick characterizes this passage as the transition from the geo *theory* to the geo *history* of the earth: from a synchronic to a diachronic conception of natural time. In geotheory, rock masses were defined "in practice by their structural relations (lying below or above)," whereas geohistory came to explain these structural relations causally, by reading strata as markers of time.[31] While the sciences associated with geotheory sought description and classification over causality, geohistory attempted to define the laws of nature in a continuum between past, present, and future. In this framework the relation between life and nonlife, the biosphere and the geosphere, became an object of causal narration.

Such developments in the nineteenth century also inscribed the materiality of the sea with time. As Helmreich writes, "The sea shifted from a framework of biblical chronology to one apprehended through secular geology and evolution."[32] Darwin advanced the possibility that life might have remained unchanged in the deep sea, and that the study of its organisms produce specimens of "living fossils" from an evolutionary past. In this sense, writes Helmreich, "the Victorian imagination, in step with the then nascent scientific archaeology, came to associate the deep with the early history of the planet, as if going deeper meant going back in time."[33] The discovery of hydrothermal vents in 1977, and of the organisms located there that live in harmony with extremely high temperatures and toxic mineral plumes, prompted a resurgence of this Victorian belief. In Helmreich's words, the microbial life of hydrothermal vents "pushed not only at the metabolic limits of life but also at the very threshold of its beginning."[34]

Geohistory provided the framework in which calculating the age of the earth became a relevant scientific question. It expanded the previous understanding of time from the religious Christian context—which, before the eighteenth century, estimated a mere few thousand years from the beginning of the planet to the appearance of humans—to the contexts of geology and a temporal investigation of the earth's underground and underwater past.[35] While the historic moment of geology's appearance as a discipline may have provoked the search for an origin story, extractivism has since continuously reinscribed being and time within the knowledge of the ocean's depth. Take, for example, how oil extraction helped enshrine the geological-legal concept of the continental shelf, or the invention of seismic testing in the oil industry, a highly invasive form of sounding the underwater strata of the earth's crust to generate data on the geological composition of the seabed.

While defending the research and preservation of hydrothermal vents due to their pertinence in ascertaining how life might have begun on earth, we should also recognize that they are the site of an origin story particular to geohistory. They should therefore should be taken as a symbol of geohistory's own entanglement with the diachronic concept of time, one of the axes through which modern biontology is perpetuated. For this reason, hydrothermal vents could be taken as a particular type of monument, one that recognizes the historical and material contingency of *bios* and *zoë* plus *geos*, "natureculture" amidst the planetary extinction caused by late liberalism.[36] They should be recognized as being of both natural and cultural significance, since it is from the knowledge of geohistory that "we" in the Global North will attempt to fight climate change and halt the ongoing sixth mass extinction. However, "our" work cannot stop there. Such a history should also allow us to cautiously recognize that while the concept of the Anthropocene may blur the modern division between what constitutes nature and culture, it does nothing to destabilize the other modern concept of geohistory. On the contrary, the Anthropocene reinforces the centrality of geohistory within geontopower. It emerges in science's need to investigate deep time further—either the past, such as paleoclimatology, or the future, such as climate predictions regarding the human impact on the earth's future geological strata.

By going forward with mining and commercial forms of bioprospecting, we run the risk of fueling late liberalism's geontology and foreclosing other noncapitalist stories, be they origin stories or otherwise. All this is occurring at a moment when our biontology is coming undone as well. Povinelli describes the difficulty of distinguishing life from nonlife at the level of biochemistry and geochemistry;

Helmreich explores how the phenomenon of lateral gene transfer has lead scientists to reconsider "genes, phylogeny, kinship and nature."[37] Finally, this recognition of a natural monument that is also a cultural construct of an origin story does not necessarily require Luddite science-bashing or a romantic nostalgia for a premodern time—sentiments which in themselves emerged as colonial byproducts. Nor should they operate under a cultural relativism that is oblivious to the history and the current mutations of the nature/culture divide inherited from modernity.

Many anti–deep sea mining organizations and communities are pushing for a moratorium on deep sea mining until 2030. They do so on the basis of the precautionary principle, which argues for caution and review where scientific knowledge is lacking. Yet, for all that is stated above, we should perhaps use the next decade to defend an extension of the precautionary principle that can encompass and negotiate forms of knowledge beyond Western biontology, just as we should question the UNCLOS's speciest category of "the Common heritage of Humankind," which does not consider heritage in terms of nonhuman life (and perhaps nonlife).[38]

The hope in concluding this way is that recognition of the natural-cultural contingency of these sites will open up a space that doesn't just prevent the exclusion of non-Western ontologies. This would be a space that acknowledges the extractivist construction of knowledge and power, and the drive to enact new capitalist sites of extraction by separating life and nonlife anew. Only then can the situatedness of Western biontologies' evolutionary geneology and origin stories become clearer and the porousness between life and nonlife, the animate and the inanimate, be acknowledged. Only then can the new "disciplinary combinations and alliances … necessary under the pressure of Anthropogenic climate change" emerge.[39]

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All GIF animations generated from videos at inhabitants-tv.org.

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Full disclosure: Mariana Silva is Art Director of *e-flux journal.*

Inhabitants is Pedro Neves Marques, Margarida Mendes, and Mariana Silva. The group produces and streams short-form videos intended for free online distribution. Inhabitants was shortlisted for the 2017 Visible Award and was DAAD artist-in-residency at the Potsdamer Institut für Klimawandel in 2019. It has collaborated with or shown at institutions such as the New Museum (as part of the 2018 New Museum Triennial), Haus der Kulturen der Welt, Museu Coleção Berardo, Contour8, and DocLisbon International Film Festival.

1
See https://www.isa.org.jm/frequently-asked-questions-faqs .

2
In 2015, scholar Anna Zalik identified a configuration of BRIC-plus countries as the main strategic players: Brazil, Russia, China, UK, Netherlands, and Japan. Anna Zalik, "Trading on the Offshore: Territorialization and the Ocean Grab in the International Seabed," *Beyond Free Trade: Alternative Approaches to Trade, Politics and Power* , ed. Kate Ervine and Gavin Fridell (Palgrave Macmillan, 2015), 174. For year, private and state-led corporations have been scrambling to adapt on-land mining technology to the high pressure of underwater extraction. Of these, state-led companies in China and Japan are the most technologically advanced in the adaptation of mining equipment to the high pressure of the deep sea, along with the now bankrupt company Nautilus Minerals. Currently, Global Sea Mineral Resources (GSR), a unit of the Belgian group DEME, and Canada's DeepGreen are continuing tests and research while China is the best-positioned country, with a total of five contracts in international waters, to inaugurate deep sea mining on the high seas. "China Leads the Race to Exploit Deep Dea Minerals: UN Body," *Reuters,* October 23, 2019 https://www.reuters.com/article/us-mining-deepsea/china-leads-the-race-to-exploit-deep-sea-minerals-un-body-idUSKBN1X213T .

3
See Ben Doherty, "Collapse of PNG Deep-Sea Mining Venture Sparks Calls for Moratorium," *Guardian,* September 15, 2019 https://www.theguardian.com/world/2019/sep/16/collapse-of-png-deep-sea-mining-venture-sparks-calls-for-moratorium ; and this press release from the Deep Sea Mining Campaign: "Nautilus Minerals: Still Lost at Sea with No Life Raft in Sight," November 25, 2019 http://www.deepseaminingoutofourdepth.org/nautilus-minerals-still-lost-at-sea-with-no-life-raft-in-sight/ .

4
Susan Reid, "Solwara 1 and the Sessile Ones," in *Blue Legalities: The Life & Laws of the Sea* , ed. Irus Braverman and Elizabeth R. Johnson (Duke University Press, 2020), 28. Chemosynthesis is what sustains organisms around hydrothermal vents—aphotic zones where sunlight does not penetrate. Like photosynthesis on land, it is the basis for these ecosystems. In biochemical terms, chemosynthesis is "the biological conversion of one or more carbon-containing molecules (usually carbon dioxide or methane) and nutrients into organic matter using the oxidation of inorganic compounds (e.g., hydrogen gas, hydrogen sulfide) or ferrous ions as a source of energy, rather than sunlight, as in photosynthesis." See https://en.wikipedia.org/wiki/Chemosynthesis .

5
W. Martin, J. Baross, D. Kelley, et al., "Hydrothermal Vents and the Origin of Life," *Nat Rev Microbiol*, no. 6 (2008): 805–14 https://doi.org/10.1038/nrmicro1991 .

6
The use of ribosomal RNA (rRNA) for genealogical classification was proposed by the geneticist Carl Woese, the same scientist who proposed archea as a separate domain to bacteria and eukaryota.

7
See https://www.sciencedirect.com/topics/neuroscience/horizontal-gene-transfer .

8
From William J. Broad's *The Universe Below* , cited in Stefan Helmreich, *Alien Ocean: Anthropological Voyages in Microbial Seas* (University of California Press, 2009), 100.

9
Helmreich, *Alien Ocean*, 100.

10
See https://en.wikipedia.org/wiki/Polymerase_chain_reaction .

11
See https://www.greenpeace.org/new-zealand/story/victory-for-the-oceans-and-all-of-new-zealand/ .

12
See https://www.greenpeace.org/new-zealand/story/victory-for-the-oceans-and-all-of-new-zealand/ .

13
Katherine G. Sammler, "Kauri and the Whale: Oceanic Matter and Meaning in New Zealand," in *Blue Legalities* , 64.

14
Elizabeth A. Povinelli, *Geontologies: A Requiem to Late Liberalism* (Duke University Press, 2016).

15
Povinelli, *Geontologies*, 8.

16
Povinelli, *Geontologies*, 6.

17
This point regarding mercantilism is made by Anna Zalik in "Trading on the Offshore."

18
Povinelli, *Geontologies*, 9.

19
Sammler, "Kauri and the Whale," 68.

20
Although *terra nullius* has not been legally invoked in this context, the rhetorics reverberate in how the claim of a barren or empty landscape is never considered as such due to prior ecological devastation.

21
Because ferro-manganese nodules are potato-shaped minerals found in planes, the notions of "picking" and "harvesting" are often evoked. This obfuscates the millenia that took to form them, and the fact that they are the geological basis of an ecosystem, and that mining would not entail picking them but would in effect scrape a few meters of seafloor—for which the closest reference would be the environmentally disastrous bottom-trawling form of fishing. "Article 77(4) of the UNCLOS defines living natural resources as 'living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil.' If a marine creature's status is sedentary, UNCLOS deems it 'harvestable,' a euphemistic term likening commercial sedentary fisheries to gathering garden fruit. Legal scholars note that the inclusion of living resources, such as sedentary species, came late in the development of the continental shelf regime." Susan Reid, "Solwara 1 and the Sessile Ones," 36.

22
Van Dover et al., "Scientific Rationale and International Obligations for Protection of Active Hydrothermal Vent Ecosystems from Deep-sea Mining," *Marine Policy*, no. 90 (2018): 22.

23
"Bioprospecting, when undertaken using non-harvest approaches, is environmentally friendly, and there are already examples of marine genetic resources derived from vent discoveries. These include enzymes that function under extremes of temperature, chemistry, and pressure ('extremozymes' developed from very small samples of vent organisms) that have substantial impact on society, as well as commercial value. The Valley UltraThin™ enzyme, which increases the efficiency of ethanol production from cornstarch and is sourced from a deep-sea hydrothermal vent organism, posted annual sales value of $150M (USD). The market for enzyme products derived from all marine genetic resources has been valued at more than $50B per year. The value of biotechnology products derived from active vent ecosystems may compete well against the value of polymetallic sulfide ores, estimated at $1B annually for each mining operation. Exploration to discover and develop biofuel, nutraceutical, biomimetic, pharmaceutical, cosmetic, and other products from healthy, active vents could be an alternative, sustainable use of vent ecosystems." Van Dover et al., "Scientific Rationale and International Obligations," 23.

24
This point regarding the necessity of actively "foreclosing" futures has been made by philosopher Alexandre Monnin, among others. See https://www.lemonde.fr/blog/internetactu/2020/03/12/desinvestir-desinnover-desincuber-demain-la-derniere-start-up/ . This point is notorious when it comes to the energy industry: oil has not replaced coal, and renewables will likely not foreclose oil, coal, or nuclear energy. Instead, global energy consumption has risen consistently throughout the twentieth-century in what is known as the Jevon's paradox. The paradox posits that an economical use of energy may simply lead to increased, not reduced, energy consumption.

25
I am following Helmreich's reading of Agamben here. Helmreich, *Alien Ocean*, 101.

26
Helmreich, *Alien Ocean,* 101. For Povinelli it is the Desert, the Animist, and the Virus that succeed the Foucauldian figures of the masturbating child, the hysterical woman, the Malthusian couple, and the perverted adult.

27
Helmreich, *Alien Ocean,* 101.

28
Povinelli, *Geontologies*, 8–9. She adds: "In other words, it is increasingly clear that the anthropos remains an element in the set of life only insofar as Life can maintain its distinction from Death/Extinction and Nonlife."

29
Povinelli, *Geontologies,* 10.

30
Martin J. S. Rudwick, *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution* (University of Chicago Press, 2005). "Mineralogy" was the study of fossils, a science of specimens detached from significant field information beyond locality; "physical geography" did involve fieldwork, but it exclusively mapped rock formations on a two-dimensional plane at the soil's surface; and "geognosy" was the term for the site-specific maps that miners produced, which encompassed depth by describing the three-dimensional structure of rock masses.

31
Rudwick, *Bursting the Limits of Time* , 640.

32
Stefan Helmreich, script for Inhabitants' series *What is Deep Sea Mining?,* Episode 2: "Deep Frontiers." Available at inhabitants-tv.org http://inhabitants-tv.org/july2018_whatisdeepseamining_ep2.html .

33
Helmreich, script for Inhabitants' series *What is Deep Sea Mining?*

34
Helmreich, script for Inhabitants' series *What is Deep Sea Mining?*

35
"A proliferation of conjectural geotheories even offered ambitious accounts of how the earth must have changed in the past and would necessarily change in the future, based on reasoning from the known laws of nature. But attempts to reconstruct the detailed particularities of the earth's history from the concrete relics or traces of the deep past were few and far between." Rudwick, *Bursting the Limits of Time* , 644.

36
I am riffing here on artist Amy Balkin's artwork *Public Smog* (2004–present), which includes a proposal to protect the ozone layer as a UNESCO heritage site. According to the artist's website: " *Public Smog* is a park in the atmosphere that fluctuates in location and scale. The park is constructed through financial, legal, or political activities that open it for public use. Activities to create the park have included purchasing and retiring emission offsets in regulated emissions markets, making them inaccessible to polluting industries" http://tomorrowmorning.net/publicsmog .

37
Helmreich, *Alien Ocean,* 100.

38
"With a wink to corporate extractivists, UNCLOS provides the legal framework for DSM to thrive. Its conservation provisions gesture to environmental concerns but are notably weak and difficult to enforce. UNCLOS imports the precautionary principle supported by the Rio Declaration (1992) and the 1992 Convention on Biological Diversity (CDB), placing the burden of proof on corporations whose activities may pose a threat or cause irreversible harm. Such proof is difficult to verify in DSM's self-regulating environment: miners establish the environmental baselines against which their enterprises are measured; monitor their own progress against these baselines; and report on any changes. Operating several kilometers below the surface also makes it difficult for independent oversight or audit, and neither the International Seabed Authority (ISA) nor PNG or any small island nations have resources to deploy site-specific monitoring teams." Susan Reid, "Solwara 1 and the Sessile Ones," 27.

39
Povinelli, *Geontologies*, 10.

A proposal for a sonic navigation—as a DJ practice—manipulating sound as much as the space and time inhabited by the * c r o w d *
A map disrupting the clock, where events are simultaneously happening
A space moving away, submerged by marooning streams of music
Porous bodies, telling stories,
Leading their altered trajectories within the
Drexciyan Queerdom

Maıté Chénière

Sonic S.cape

Sonic S.cape is merging territories. To access its full scope: press play on the video, at the end of the countdown press play on the soundtrack. Play it loud.

View video here: https://youtu.be/e3adcLgB-ag

View soundcloud here: https://soundcloud.com/mightyshantay/sonic-scape-e-flux-journal-hafi-navigation-issue/s-GREzPeDV4e3

Track Material:
Frankie Knuckles, “The Whistle Song” / Laurel Halo, “Sun to Solar” / Soul II Soul, “Keep on moving” / Kingdom, “Stalker Ha” / Kelela, “Turn To Dust” / DJ Chuckie, “bubbling beats 4- caribbean drums” / Brownstone, “If You Love Me (Acapella Version)” / S.O.N.S., “Tribute To The Truth” / Art Of Noise, ”Moments in Love” / LSDXOXO, “Freestyle 4 Remix” / Dean Blunt, “Six” / BE3K, “yaCUNTcuntCUNT (Vogue Beat)” / Serpentwithfeet, “Whisper”

X

Maïté Chénière (a.k.a. Mighty) adopts theoretical research, music, performance, and video to create hybrid experiences. In their practice, they merge the cultural productions of racialized queer people with theoretical and popular knowledge to create an emancipatory discourse.

Chénière holds a master’s degree in Visual Arts, CCC – Etudes critiques curatoriales cybermédias from HEAD – Geneva and a bachelor’s degree in Visual Arts from the Royal Academy of Fine Arts in Brussels. Prior to that they studied woodwind instrument making and repair at

Newark College, England. They have presented performances at Un Lieu pour Respirer, Paris; Haus der Kulturen der Welt, Berlin; Festival Les Urbaines, Lausanne; Théâtre de l'Usine, Cinéma Spoutnik, Geneva; Mains d'œuvres, Paris; and Ateliers Claus, Brussels, among others.

Mighty is an Afrofuturist DJ, producer, and founding member of Archipelagogo, a series of club events that promote the works of queer people of color in Geneva. Through music, they travel in time and shed light on stories that have been ignored, in order to create a space of expression and gathering on the dancefloor for a multiplicity of bodies and identities. They've played eclectic sets revolving around house and ballroom in Paris, Berlin, Leipzig, Johannesburg, and throughout Switzerland.

Ramon Amaro and Murad Khan

Towards Black Individuation and a Calculus of Variations

> "The functioning of a machine has no sense, and cannot give rise to true information signals for another machine; a living being is required as mediator in order to interpret a given functioning in terms of information, and in order to convert it into the forms for another machine."[1]
>
> "Perception is not the seizure of a form but the solution of a conflict, the discovery of a compatibility, the invention of a form."[2]

Introduction

The following reflections concern what we call Black psychic individual and collective individuation. We reflect on what it might mean to address what Frantz Fanon describes as the problem of "The Negro [*sic*] and Language,"[3] and its impact on one's comprehension of existence and the dimensions of the other. We take a radically interdisciplinary perspective, as we seek to rearticulate the foundation of Black existence through the problem of individuation. In "L'individuation psychique et collective" ("Psychic and Collective Individuation")—the final part of his main thesis *L'individuation à la lumière des notions de formes et d'information*—Gilbert Simondon challenges substantialist metaphysics, or the primary units of reality whereby existence is grasped from the perspective of substance, as opposed to the unfolding of becoming of an individual. In other words, substantialist metaphysics operates within assumptions of fixed and stable terms under which autonomous structures are constituted.

Here, Simondon contests dominant notions of individuation as a problematic that begins with the individual as a point of departure. Simondon challenges us to instead think about the individual starting with the process of individuation itself, thereby forcing a reformulation of perceived categories of knowledge. For Simondon, the energetic potential that arises in this reformulation is a liberating act of becoming. If we consider the problem of Blackness as a problem of Black individuation, then we are confronted with a misdiagnosis of Black alienation, whereby the principles of racial stereotype are posited as anterior to "knowing" the Black individual, and therefore Black life. The perspective challenges notions of Black existence as a racial "form" primarily in relation to what Sylvia Wynter describes as the "substance of race."[4] According to Wynter, the substance of race is the grasping of Black existence as that which already unifies racial perception with the staging of white

European power over the other. The substance of race constitutes an ordering of the world through the image of white supremacy as a precondition for the structuring of society. Here, the white European male (what we might call the ideal state or "good form") is ascended to the apex of human value.

It is here that Fanon argues the Black being is devoid of any sense of humanity—where the events of life are crafted by the singular event of whiteness. Black individuation, as such, is an overdetermined pause in the process of self-actualization. For Fanon, this ontological erasure of Black existence conceals the exposure of colonial metaphysics as the source through which Black individuals internalize inequitable relations with whiteness. What he means is that within the ontological architecture of being is a comprehension of the "dimension of the other" where one takes cognizance of colonial systems of knowledge that result in self-division.[5] Self-division for the colonized has two dimensions. One has the awareness of the languages by which one is confronted with race; the other is a possession of an evidence that expresses reality, as such. When one understands this self-division, one often considers the process of individuation complete, whereby the mastery of language affords remarkable power to know the world and change it—if one takes pains to speak against a mode of existence for and through another.

At both the ontic level and the exhaustive organization of race as a hierarchical knowledge domain, is the study of existence and the nature of being Black within a larger relational system. More so, the relation between the Black self and environment must be elaborated on if, as Paul Gilroy suggests, the structures of race are to be overthrown and Black being is to be disalienated. It is here, through the rearticulation of calculus as a language along with the act of invention, that we argue an integral existence might constitute what Félix Guattari posits are "the seeds of the production of subjectivity," which disallow "the presence of a passively representative [Black] image, but a vector of subjectivation."[6] Our aim is to consider what problematics might arise—in terms of individual psychic and collective individuation—when the actualization of the self (or the process of individuation) is entwined with the alienating logics of racial calculation. By logics of racial calculation, as an expression of the calculus of variations, we posit that the operative logics of racial organization are held within two domains of the absolute maxima and minima values of racial perception. We elaborate on a specific conceptualization of a calculus of variations in what follows. For now, we want to think through this vector not as a variable quantity or quality that can be resolved into components, but one that instead finds a solution to the problem or question of race from within the act of existence itself.

Speaking on existence, Fanon emphasizes the structural and subjective dimensions of the so-called colonial arrangement, and the extent to which the colonial order sought to naturalize the act of racial hierarchy in the world through scientific enquiry. There is an operational logics of scientific observation that naturalizes racial perception as actuality, having verified racial sorting as the absolute value of a fictive natural order. Here, the Black body becomes the primary object of racial organization, and ontology becomes, as Gilroy writes, "a historical phenomenon and thus, despite its external, fixed appearance, the unstable equilibrium [through which] the racial corporeal schema can be overthrown."[7] One goal is to understand the characteristics of race as a dynamic relation within a system of racial equivalence, which also illuminates how a calculus of variations, or the concretion of the Black individual, might operate between the extrema of race relations.

The opportunity presents itself at the moment of racial interpellation, and is enacted—as we will argue—through a dual mode of invention: one that brings forth a pre-individuated historicity with the problem of race, and another that makes more affirmative use of a particular imaging of racial stereotype to catalyze new modes of individual and collective psychic generation. We hold in full view that the extent of the problem entails an immediate recognition of the social, political, and economic realities of being Black in the world, in one sense conforming to Fanon's view. On the other hand, we take at face value Fanon's insistence that "the black man's alienation is not an individual question."[8] While interpellation is grounded in racial subjugation and the proliferation of political and economic ideology within existing power structures, we advocate for an expanded notion of interpellation, as that which drives opportunity for internal transformation. If this is so, then the notion of the Black "individual," as well as its ontological orientation, must first be dismantled and reengineered.

The foremost goal of this essay is to break with the stated supposition that Black existence is a logical extension of the substance of race. While remaining fully aware of the restrictions of race, we want to think through this study as an act of making oneself contemporaneous with the existence of being. By this we mean the placing of the question of Black existence as one of individuation to better understand the limitations of a priori assumption in Black thought. Secondly, we seek to uncover the potential for concepts of Black thought that might bring forth new ideas of what it means to be Black in a world regulated by the substance of race.

We ascribe to the basic importance of reengineering one's self as a necessary step towards grasping a new process that broadens the field of description. This type of reengineering makes reference to a process of the reinvention of self-image, where one might create new modes of internal and external cohesion. We argue that this is achieved by means of a purposeful misrecognition of the dominant ontogenetic perspective of racial

individuation. A dual mode of invention, as such, indicates what we call a maxima and minima of human existence in reference to the preexisting image of Blackness within a domain of race equivalence, as set forth by a break in the calculation of self-variation.

While this concept might appear to reduce the dynamics of this race equivalency within this domain to the mediation of a multivalent set of relational distinctions, it is—as we posit following Simondon—passage through the domains of language that is necessary to reveal the operative function of race and racialization. It is here, as Aimé Césaire might argue, that the search for a humanism "made to the measure of the world" as an expressed reality might instead work towards a new horizon of self-determinacy.[9]

What if we sought to comprehend this new horizon as a grasping of Black individuation from within the cultural weight of colonialism, where one finds the measure of their validity in the problems we confront? What if the individual in relation to whiteness was not given as a fact preexisting the operation of being and becoming Black? What if the image of Blackness, and thereby the Black individual produced by colonialism, was merely one element of individuation constituting a false assumption of the exhaustion of Black existence? Finally, what if Black existence was grasped not as a final outcome in recourse of the presumption of racial logics, but as a process of individuation that reformulates the categories of knowledge, thereby shifting ontological assumption from one that exists in relation to whiteness to one who's principle of genesis becomes internally generated and invented from within?

We argue that the importance of this work stems from its direct engagement with certain incompatibilities or tensions that constitute the problem of Black being. We argue for a new relation between the internal and the colonial relation with a type of metaphysics that does not assume Black existence as already individuated by the "substances" of racial equivalency. We loosely follow Simondon's position that what is perceived as Black individuation is not a matter of representation or emanation. Instead, racial duress becomes the secondary manifestation of a primary operation of Black individuation that is only a partial and relative resolution of a pre-individual reality attained in the "form" one assumes. It is here where we begin to explore the implications of invention, and the challenges facing the study of Black individuation. In doing so, we clarify the concepts, terms, and operations at work in the crucial dialogue between—what we argue below is—a "knowing" of the self as a preexistent racialized individual, and the invention of the self as the motivating impetus of Black existence.

We, nonetheless, ask readers to explore the aforementioned challenges by passing through the coppice of theoretical and speculative engagements below. Each prompt is a brief encounter that exploits certain pathways to understanding the problem of Black individuation. The prompts are not meant to be read in any particular order. To the contrary—through self-selection—they are meant to violate the auspices of categorical operation at work in the engendering of racial thinking. The essay as a whole is designed to be a recursive dialogue between the authors, the reader, the interface, and iterations of thought that inform the cycles of understanding. We believe this method is useful for reengineering thought as a practice of what David Scott describes as an "inventive strangeness," to think through the notion of assumption and the calculation of Black existence.

Blackness is best understood as...

Option A: Maxima Incompatibility

> "At its extreme, the myth of the Negro, the idea of the Negro, can become the decisive factor of an authentic alienation."[10]

Settle down ... and stay where you belong. "What else can this stereotype, this central theme of dreams," as Fanon posits, "represent except putting the individual back in line?"[11] To speak of society's dream is to wander along the path of racial subjection, a path whereby the supposed character of the racialized individual arouses a desire for dependency on the white colonizer and a feeling of inferiority. "Dirty n***er!" Or simply, "Look, a Negro."[12] While the Black individual came into the world to find meaning in things, they instead find themselves as an object in the midst of other objects. They are abraded, according to Fanon, into nonbeing; and endowed with the movements, attitudes, and glances that thrust the Black individual into a fragmentation "put together again by another self."[13] Desires to capture and sort these forms of self are forecasted onto alternative grids of relation that themselves form new socio-techno-politico hierarchies while simultaneously flattening the lived experience of Blackness, or what we describe as life in excess of the absolute values of race.

We conceive of this excess value as a method of invention that exceeds the upper limits of a system of race equivalency. A system of race equivalency places the psychic individual and collective individuation into question as a condition of collective value, which in this sense is that which emerges as a normalized system whereby the racialized individual finds themselves resolved by means of a "constructive amplification."[14]

For in the real world, the white world, the Black individual

encounters difficulties in the process of self-actualization. The Black individual is furthermore surrounded by an atmosphere of a certain uncertainty of their own individual psychic and collective individuation. Fanon defines colonialism as a structural ensemble that can only be modified by degrading or augmenting entropy, whereas the measure of uncertainty of an alienating outcome represents the amount of energy in the system that is no longer available for self-actualization. Racial alienation is thereby intensified in the internal socio-diagnostic relation—a process in which prognosis resides "in the hands of those who are willing to get rid of the worm-eaten roots of the structure."[15] Fanon moves towards systematic racial tendencies to view the systemic as a dialectic of objective and subjective points of view that seal the white individual into whiteness and the Black individual into Blackness. These views are juxtaposed into a modulation between the molding of oneself in relation to whiteness at the uppermost limit of the white racial imaginary, and the prohibition of any Black individual variability that is incompatible with the disparate dimensions of a metastable racial system.

Option B: Metastability

A metastable system is defined by the type of information that it possesses, according to Simondon.[16] In "L'individuation psychique et collective," Simondon outlines the notion of information as perception that does not preestablish form. On the contrary, information takes temporary possession of its orientation in an ensemble of engagements with the world. Perception is where one retrieves the information necessary to make sense of its orientation, allowing one to orient oneself in the surrounding milieu. On the basis of this perception, the potential for new individuations are brought into conjunction with the collective, if only temporarily.

By the study of metastability one might understand the conditions of existence founded on the axiomatic of racial equivalence. A metastable system would thereby designate a flow of energy that circulates within what might appear to be the stable organization of race, or what we have termed "race equivalency." A system of race equivalency appears as a definitive structuring of the self and the world, a dialectic between the body and the world, a maxima or absolute value that reconstructs the fragments of Black existence at the uppermost limit of the myth of racial stereotype within the white imaginary. A normative system of race equivalency further delimits a set of white prototypical values that, in the process of individuation, brings coherence to a collective system.

Equivalency weighs elements of comparison as if each characteristic is comprised of a commensurate capacity for value, significance, or equal standard of measure given the relative importance of the relation within the racial system. A stable system of race equivalency, in other words, amounts to a state of being that assigns qualities with comparability (in this case to whiteness and the colonial imaginary), as well as an individual's usefulness within a set of imaginary ideals. The white imaginary is closely aligned with a colonial epistemic that seeks to estimate and determine individual importance and thereby the likelihood of regard within the system as a whole.

Within a system of race equivalency, the act of racism justifies the setting of the white individual over and against the collective. While Fanon asserts that this type of system needs to be overturned, the incompatible Black individual is nonetheless assumed to be an inactive and completely passive form, as defined by the colonial model of racial equivalence: "Many Negroes will not find themselves in what follows. This is equally true of many whites."[17] It must be asked how the Black individual can be excised from this order if, as Fanon asserts, "in the absolute, the black is no more to be loved."[18] What if the metastable racial system contained a higher magnitude of energy wherein the Black pre-individual instead possesses a latent potential for a self-love that is manifested from within systemic incompatibility? What are we to make of those who find themselves within the myth of race—at a stage where, given their race, they are no longer understood?

Answers to these provocations require a shift in the assumption of equilibrium, or more so the necessity for an equal distribution of energies within a metastable racial system. The substance of race relies on a false assumption of equilibrium as that which produces stability within a simple racial structure. If we consider a simple racial structure as instead a metastable racial system, then what emerges is—following Simondon—a system that is transient and in a temporary state of stability even as it contains pre-individual, as opposed to stable individual, states. Even though the stable racial system may, *in actu* as an organizing principle of the system, designate flows of racialized information, metastable racial systems contain a higher magnitude of energy that harbors latent potentials and incompatibilities with the system itself. In other words, a metastable racial system is a fragile milieu in which local information exists as conditions of the overall state of the actual. It is always already in a state of transition and transformation through which the tensions of its incompatibility in the actual can seize upon opportunities found within the pre-individual milieu. A metastable racial system is open to augmentation and expansion by way of new technical inventions, often serving the purposes of maintaining an inequitable racial equilibrium, thereby placing its own set of demands and pressures upon the social system. As a result, the system finds itself already in need of transition, whereby its next phase is actualized through a new set of heterogeneous conditions.

Option C: Value

The outcome of colonialism is assumed to predetermine the psychic condition of the Black individual as that which is constituted by the fictive substances of race. We seek to reflect on the implications of what David Scott calls "constituted individuality," a principle that holds the properties of the individual to be the starting point from which certain transcendental truths are derived.[19] The very notion of the constituted individual absorbs metaphysical Black existence into logical dependencies on a fictive hierarchal assumption. A return to the constituted individual, as well as its ontological origin, sets a foundation for an epistemological guide on the inequitable equivalency of Black and non-Black peoples.

While Fanon's schema, in particular, promotes the idea that Black individuals only ever exist as already individuated beings within the substance of race, we might instead consider breaking from the metaphysical myth of racial solidification that requires a reciprocal codependency—where certain "incompatibilities and tensions" are remade to account for a new relationship between the Black individual and the racial milieu. What if the Black individual emerged only as a certain phase of being in the midst of bringing into reality the conditions of the actual, or a transduction that describes an operation by which the activity of being is conceived from the movement between one tension and another, each amplifying the other to produce transformation and a new phase of reality?

Just as reflexive thought "risks its own coherency," so too can it uncover that which unifies its values.[20] If we consider race equivalency as a type of communicative calculation, then (racial) language, as Simondon argues, "disclose[s] the nature of its action" in order to reveal that which drives the transformation of race as an absolute value of self-transformation. What transpires is a new ethics of relation, or relational activities in the act of becoming incoherent.

Simondon proposes an alternative by altering the ontological terms of individuation itself. In describing the metastable, Muriel Combes elaborates on one of the core components of Simondon's "L'individuation psychique et collective":

> A physical system is said to be in metastable equilibrium (or false equilibrium) when the least modification to the parameters of the system … is sufficient to break the equilibrium of the system. Before all individuation, being can be understood as a system containing potential energy. Although this energy becomes active within the system, it is called potential because it requires a transformation of the system in order to be structured, that is, to be actualized in accordance with structures. Preindividual being, and in a general way, any system in a metastable state, harbors potentials that are incompatible because they belong to heterogeneous dimensions of being.[21]

As opposed to the concretization of a system comprised of an ensemble of parts in relation to the whole, a system can instead be defined by the type of information it receives. According to Simondon,

> it is through individuation that a partial and relative resolution of a pre-individual reality is attained in the "form" an individual assumes where certain incompatibilities and tensions constitute the problem internal to being and the potential for new individuation to be brought into conjunction and become compatible—if only for a time.[22]

Andrea Bardin reads Simondon's notion of "absolute" value here as that which, in following value as an organic or technical condition, institutes a relation between individuals and acts as a trigger for collective relation. Most importantly, the absolute represents the penetration of certain values into social systems, as a transductive force that organically operate under technical normativities (such as "instinctual" patterns of behavior). Indeed, Bardin cites Simondon's *Note Complémentaire* in which he states: "Norms are lines of internal consistence in each of these equilibriums, and values are the lines along which the structures of a system are translated into structures of the system substituting them."[23]

In this sense, values are constitutive of an individuated reality, enabling the conversion from one normative system to another. Yet, values simultaneously exist at the pre-individual stage as they enable the translation of norms in and between various stages of the process. The absolute is thus best understood as the stabilization of organic and technical normativity existing in disequilibrium, giving rise to an individuated reality that "integrates the normativities exceeding the functioning of the social system by 'enveloping them' … with significations."[24]

Option D: "How does it feel to be a problem?"

> "In the Weltanschauung of a colonised people there is an impurity, a flaw that outlaws any ontological explanation. Someone may object that this is the case with every individual, but such an objection merely conceals a basic problem. Ontology—once it is finally admitted as leaving existence by the wayside—does not permit us to understand the being of the black

> man [*sic*]. For not only must the black man be black; he must be black in relation to the white man."[25]

The relative importance of an assigned racial quality and the relation between the essential properties of race, at the limits of the upper and lower boundaries, is measured by sensitivity to change—or a responsiveness to self-reference as well as external stimuli (such as anti-Black racism).[26] Simondon presents this openness to change as a "margin of indeterminacy" that provides the conditions of possibility for advanced (technical) objects to adapt to changes in their milieu—arresting the tendency towards determinate forms, and instead embracing incompleteness in the process of individuation. Consequently, Black genesis becomes a point of departure for ontology and the theory of knowledge first, prior to a preexisting theory of systemic hierarchy.

A sensitivity to the process of Black individuation, as such, lends a certain quality to the registration of affective changes, small changes in function, and the mappings of difference in each quality within the pre-individual state. Sensitivity provides an unelaborated awareness of stimulation apprehended through experience from within the field of race relation, and of knowledge transferred from one moment of racialization to the next—each transferring knowledge of the operation of structures as a procedure or catalyst for subsequent iterations of becoming.

The constitution of the Black individual qua Blackness-as-a-problem allows for the White individual to be constituted at the level of resolution. The ontogenic problem designates an ontological property, driving becoming through the resolution of tensions and overcoming disparity through new functional structures. For Simondon, ontogenesis designates the development or becoming of being, framing the individual as an outcome of the process of individuation, and not the inverse. The individual therefore operates within a psychic excess that is unsolvable by inter-individual relations, as they are presented with an affective and perceptive disparity. Such a being can only resolve a disparity in the internal problematic through participation in collective individuation. For this reason, Simondon necessitates participation in social life as a precondition for a form of individuation which is best understood as a psychosocial process.

Option E: The Languages of Alineation

> "What if there were a real language operational only ever in conflict with its originating structure and, thus, fully expressive of those pre-individual tensions giving rise to it? How is it possible for such a language, seemingly at odds with itself, to be the effect of a community and unify a group?"[27]
>
> "The threshold of non-decentering, and thus of non-alienation, will only be crossed if man intervenes in technical activity in the dual role of operator and object of the operation."[28]

The totalizing perception of the racialized being links the problem of race with the problem of language, which is furthermore distributed or communicated through the technical object or apparatus.

For Simondon, language is preceded by signification, displaced as a mere mode of expression and communication into a secondary consequence of information, and thereby individuation more broadly. Language is not itself information, but instead is best understood as a signal made comprehensible in the receiver under the constraints of a specific structure. As a vehicle of information and thus a mediation between the subject and its milieu, language impels "whatever discourse it structures to confront those pre-individual forces that have led to its genesis."[29] Thus, the ways in which calculation (as language) is made operative reflects what David Scott describes as a mediation between the subject and its milieu (the milieu being the convergence of a particular set of [racial] forces that materialize into a single expression). "Equally communicated," as Scott posits, "with every word is what murmurs within it and is borne by it—those tensions it subsumes, rehearses, and forms through the transformation of information into signification" (in this case, the signification of race and the interpellation of the racialized individual).[30]

We resist the dismissal of language as an innate instrument disconnected from its operative reality (whether that language be computational code, symbolic mathematics, social custom, or colonial rhetoric). As Sylvia Wynter has argued, even as race restructures itself in the everyday by ignoring what Simondon describes as the "voices of silence," race remains operative as a foundational part of collective perspective, as well as the collective understanding of self. Instead, we seek to prioritize language as "action, as offense and as seduction," in quoting Simondon; while language may rest in the domain of the seemingly absolute or outright totalitarian view of the world, it might also bring into visibility the potential for an affirmative view of the self and environment.

Option F: Unlocking the Body

> "There are times when the black man is locked into his body."[31]

If the universalist construction of humanism is founded upon the abstraction of the Black individual (as an object defined by a system of race equivalency), then the epistemic schism it produces is concealed within the body itself. The racialized world is condensed into the Black pre-individual state as a "corporeal malediction"—an epidermal myth under the aegis of which the world can be ordered via the image of whiteness.[32] The Black individual, by way of the body, is formed around a set of typologies, or values, marked by the isomorphisms between white desire and technical practice. The Black individual risks concretion by the continued persistence of an epistemic system presumed as a unified system of racial value.

Such value emerges within a system of race equivalence as a codeterminative quality that coheres to a collective perspective by way of a transductive operation. Transduction, according to Simondon, is that which mediates different organizations of energy.[33] The process of transduction unfolds where a disparity or difference is temporally and topologically restructured across an interface. The cohesion ensures the persistence of a system of equivalence through differing permutations. It is furthermore the mode of unity, in Simondon's words, that

> effects the reversal of the negative into the positive: meaning, that which makes the terms fails to be identical with each other, and that which makes them disparate (in the sense in which this expression is understood in the theory of vision), is integrated with the system that resolves things and becomes a condition of meaning.[34]

Values as such are an emergent expression of meaning within a system, existing in a relation of operation that allows one structure to be translated into the structures of the system that replaces it. Value thereby encapsulates a process by which dissonance and difference are rearticulated in the process of transformation and amplification. We might think of the process as the crystallization of information that becomes both difference and the possibility of difference whereby the conditions of the process of individuation are triggered.[35] Individuation, in this instance, is not that which has been totally resolved. It is a process whereby the reality of living beings is neither social or individually orientated, but instead accumulated within the individual who carries this reality as belonging to the system, as opposed to being made part of a system of being as individuated. David Scott writes:

> "To know" individuation starting from the individual reduces individuation to no more than a re-presentation of the posited individual, whose principle of becoming pre-exists what it supposedly determines, while "to know" the individual through individuation forces a fundamental reformation of categories of knowledge raising their ontological status to that of a problem, thereby shifting the ontological presumption from being to becoming, from substance to individuation. It means the principle of genesis becomes internally generated from within the process of individuation itself.[36]

In the process of translating racial value, a transductive sequence folds the value of each iterative resolution into its successor, even if the disparities present in the pre-individual field are not fully resolved. In this way, the individual can be seen as a self-constituted "topology of being that resolves an anterior incompatibility through the apparition of a new systematic."[37] A model of self-constitution as such, in full augmentation of existing topologies of being, is one of interiority in resonance with the external milieu. The affective world of the Black individual is thereby conditioned in consonance with the exterior milieu, as well as a perceptual world arranged in accordance with a calculus of variations. We might therefore problematize the internal and external conditions of Blackness as a chronotopic integer, or a spatiotemporal language that organizes the Black individual around a continual process of resolution in racialized environments.

Option G: Shared Qualia and Internal Circles

A system of race equivalence is constructed on the basis of shared qualia, bringing coherence to a collective perception and maintaining compatible interindividual relationships in a metastable environment. Such qualia are defined in tandem with a structure of value open to augmentation via the introduction of potentials and new technical inventions. Equivalence thus acts as a regulative component of a system, keeping it in a state of homeostasis whilst values ensure that this consistency persists across new individuations. With each new individuation a process of translation occurs, in which norms crystallize, defining interindividual relations through the support of the values that emerge in concert with them. As a result, interindividual relationships in any such process of individuation are defined by the transience of signals rather than signification, with subject relations functionally bound by the representations given by the established normative system. Thus, the moment of translation carries a neutralizing function which is simultaneously one of mis-recognition, foreclosing upon the "tendency of the subject to put itself into question" and precluding the reflexivity necessary to institute a properly transindividual mode of relation.[38]

If we think of reality as a continual process of transformation only ever comprised of indeterminable modulations, then any process of coherence or incoherence of the order might appear to be a rudimentary field of perception enacted by the epistemic. It is, to the contrary, a reorientation of desire that assists in the reestablishment of a new, more equitable racial relation. Still, there is a consistency of Black psychic alienation that resides within each stage of individuation, mobilized in consonance with new schemas of racial information. Recognition of Blackness thus acknowledges the racial information that regulates the Black individual's conception of self. Such an image is continually called forth when the task of recognition arises, forcing the Black being into a perpetual negotiation with its racial milieu. As a result, Black subjectivity is (re)produced in a coterminous relation with what Fanon terms "history," or the construction of "thousands of details, anecdotes, stories" that stage the image of Blackness as that which can only be comprehended as a dimension of the other.[39] A pre-individual state, as such, lacks the stability of the Kantian transcendental whereby "being as subject and being as object result from the same primitive reality."[40] Instead, the imago (perception) of the black individual at once provokes, as Simondon argues, individual action that synchronizes collective behavior while—as Scott describes—"excluding and identifying in order to distance oneself from the 'stranger,' the deviant, the other."[41]

This other, as transindividual image, is the bearer of a reality that is both psychic and collective. Blackness provides the fulcrum upon which difference is transformed into integral opposition, organizing and securing the metastable field. However, if, as Simon Mills suggests, the transcendental as individuation guarantees a shared epistemic surfeit, then the subject's experiences are conditioned as a confrontation with the transcendental problematic, and must resolve the existing tensions through a new schema of understanding, occurring from within a process of invention.

Option H: The Imago of Blackness

For Fanon, the emergence of French structuralism in the late 1940s and early 1950s provided an opening to problematize the psychic individual and collective negation of colonized peoples. While a return to structuralism might prioritize an anthropocentric point of view, it is an important point of entry into a theory of Black lived experience. As Fanon has shown, the lived experience of the Black man [*sic*] is crucial to the fundamental realization that the Black individual holds a position outside of the discursive concept of the Human. Fanon points towards the genesis of the psyche as a reciprocal organization of formal human properties, which is evidenced by the undeniable reality of racial subjugation.

Fanon situates this problem through psychosocial analysis, drawing upon Jacques Lacan, and early Lévi-Strauss to think through the effectiveness of racial symbolism. His aim is to discuss the gravity of the specular image of Blackness as the minimum threshold of human value.[42] The resultant psychosocial experience locks the Black individual into a permanent cycle of fragmentation, whereby the perception of the self (as part) and colonial society (as whole) become central elements to understanding any internal conflicts imposed by the perceived disparity between the external perception of Blackness and self-determination. The image of Blackness is thus a psychic problematic that occurs at this dissonance or absolute extrema, where a problem designates, as Daniela Voss puts it, "a structural moment in the dynamic process of individuation: a moment of metastability, of disparity between different orders of magnitude … and eventually the resolution of the tension by amplification, that is, the leap to a higher, functional ensemble."[43]

Simondon also sees a theoretical clearing in structuralism to address the problem of coming into being, and to reformulate the individual in terms of ontogenesis. However, Simondon distances himself from structuralism by suggesting an "allagmatic" point of view, or a theory of operations that oversees " a conversion of a structure into another structure."[44] This point of view allows Simondon to disrupt any ontological or epistemological privileging of structures—in this case, race—in favor of a view towards the relationship between racial structures and operations that are instead brought into view for modification and subsequent transformation.

Understanding the centrality of the Lacanian imago to both Fanon and Simondon's thinking is crucial to recognizing the image of Blackness as an affective modality externalized in the production of white subjectivity. It is upon this shared ground that both Simondon (who describes a cycle of images undergone in the genesis of an organism, most notably in his 1965–66 course "Imagination et Invention") and Fanon (who grounds the white sublation of the Other as a determinative imprint upon Black subjectivity) can be thought together to analyze the role of the collective, pre-individual image in the production of the self.

Simondon's cycle of the image is properly differentiated as an operation of three stages. The first of these can be taken as biological, concerning those anticipatory motor-images developed as the organism grows. These endogenous images are more readily understood as instinctual patterns of action which are given primacy and autonomy in the formation of the pre-individual. Patterns of action are functionally independent from the individual, and occur at the embryonic stage. They furthermore act as a priori images ontogenically developed across the lifetime of the organism.

In the second stage, perception is conceived as that which aids the organism in extending itself beyond its instinctual gestures, primarily in response to information in the external milieu. It is here that the development of a schemata begins, which itself facilitates any perceptual relation between the internal and external environments. The development of a schemata is a mode of operation that is, according to Simondon, of a technical mentality, which develops in concert with new sciences of systemization. Any subsequent properties or categories that develop as part of the system are, therefore, always already conditioned by disequilibrium. That is to say: "The image is used here as an instrument of adaptation to the object, it assumes that there is an object and not merely a situation."[45]

Finally, the third stage in the image cycle outlines the process by which the individual develops an *Innenwelt* ("mental world") of affective-emotive content within which they possess "an analogue of the external milieu, having also its constraints, its topology, its complex modes of access."[46] Together, these three stages comprise a dynamic process contributing to the genesis of the image within an individual under a more universal backdrop of collective development.

Simondon deploys the Lacanian imago to outline the transition that allies the second and third stages, between which the mental image is translated into an object-symbol. This is achieved by way of the imaginary's contortion of an "organized world" in transindividual (Black) objects. Dispensing with Lacan's opposition between image and symbol, Simondon favors the image-as-organizer, an image that is "already an elementary symbol."[47] Andrea Bardin's account of Simondon's thoughts highlight the imago's position within a metastable field. As result of disparity, or tension, between the memory-images of the individual, the imago is stuck between two orders of magnitude. The product is a set of "socially instituted symbolic relations that provide the subject with access to reality."[48] The discrepancy in structure here means that Simondon can define the phase-shift of the social "between two regimes of relational activity or communication which simultaneously take place at different scales, individual and collective."[49] The imago, as a structure of conversion, is thus a transductive explanation for the collective system of relations that exists between the individual (and the imaginary) and their (symbolic) milieu, creating the metastable "organized world" of the transindividual as one rife with possibilities for invention.

The locked body, as an epidermal surface, is fixed in objecthood. For Fanon this fixation occurs in language, operative in the word " *négre*." Race-specific language is no more than a racist shroud, enveloping the body as determinative displacements of the possibilities of Black individuality. At work in both schemas is a logics that mediates individuation within a transcendental frame. Stripped of depth and sutured to the body, the image of Blackness is granted fictive stability by way of an anterior act which announces and guarantees the presence of a particular type of human. As this transcendental condition becomes an institution of habit, transduced across individuations, it is restated by varying forms of technical rationality. The Black individual is reproduced as an imago, necessarily alienated and viable to the abstraction of variational analysis. As Sylvia Wynter notes: "While it is we humans who ourselves produce our social orders, and are in reality its authors and its agents, we also produce, at the same time, the mechanisms of occultation which serve to keep this fact opaque to ourselves."[50]

Wynter reminds us that found within the novel invention of European humanism is the creation of both an order and the stability of racial hierarchy. The Black individual, as an exteriorization of the white desire for epistemic certainty, grounds the structuration of the transindividual relation of racialization as a pre-individual process, imprinted prior to any self-representation. The Black individual therefore recognizes Blackness as a "symbol of that which is always already given to be seen"—a projective facet of the colonial perceptive arrangement that preforms the Black individual around the naturalized fantasy of the white subject.[51]

Option I: An Untimely Invention

> "I am not a prisoner of history. I should not seek there for the meaning of my destiny. I should constantly remind myself that the real leap consists in introducing invention into existence. In the world through which I travel, I am endlessly creating myself. I am a part of Being to the degree that I go beyond it."[52]

Thinking with both Fanon and Simondon, we propose that invention is the most adequate model for the resolution of the tension between the Black individual and the collective, apprehended as a modulation at the extrema into the absolute. To think as such is to think of individuation as an event or, as Alberto Toscano suggests, the "invention of a relation."[53] In this mode, invention represents the dual relationship of interiority and exteriority that properly characterizes Simondonian thought. Transduction becomes a process axiomatically applied to being at all scales.

Invention comprises the fourth and final stage of Simondon's cycle of the image, taking place at the point at which a systematization of images (the third stage in the cycle) finds itself oversaturated at the local level. The invention overflows into the collective, which must then

reorganize and restructure in response. Invention thus operates transductively, with a shift in relational modalities occurring at the point of saturation to push and guide collective culture into new structurations. Invention is therefore not an adaptation-in-relation to the individual's milieu (an environment structured by the substance of race), but rather an axiomatic application of transduction across all levels of being in a metastable field. Here, the individual modifies their own internal states in response to an exceptional event.

For Simondon, the exceptional event that triggers invention is an untimely phenomenon. This is especially prominent in his reading of the tightrope walker's death in Friedrich Nietzsche's *Thus Spoke Zarathustra*, and his account of the technician in *On the Mode of Existence of Technical Objects*. In both instances, as Simon Mills notes, "the actions of an untimely individual act as a singularity for the invention of a future, rather than as a mere adaptation to a pathological present."[54]

In the case of the tightrope walker, the exceptional event serves to reveal to Zarathustra the interindividual relation for its true role as a social function forced upon the subject, opening upon the transindividual, as the tension between the individual and the collective is both revealed and dissolved. As the tightrope walker lies prostrate upon the earth, fallen from his rope, Simondon designates him as a pure relation caught between two individuated modalities: corpse and fool. The distance between these two modes of relation opens upon a new "vector of subjectivation"—the possibility of a relation beyond the interindividual. This moment ruptures the established system of norms and opens upon the questions that constitute a complex psychic life. Indeed, Scott notes that Zarathustra's experience with the dying tightrope walker reveals that he requires something in excess of himself, forcing a reflection upon the need for companions, "living ones—not dead companions and corpses that I carry with me wherever I want," says Zarathustra.[55] He decides to seek out those who will break with social convention, and will "write new values on new tablets."[56] Zarathustra's untimely encounter with the tightrope walker reveals the interindividual relation as a function of mis-recognition, obfuscating the subject by cloaking it in its social function. The exceptional and untimely event is thus a moment of disindividuation, putting the subject into question by forcibly distancing them from the perceptions of the community in order to open upon a transindividuality.

Therefore, to exceed the interindividual domain, and to ensure the passage to the transindividual, the subject must realize the antecedent potentialities that constitute it, at the level of the pre-individual, in order to overcome them. The Fanonian theory of invention is best understood in relation to this reading. Taken as an interruptive measure, invention is mobilized at the psychosocial limits of racialization (the absolute extrema) emerging as a moment of a radical untimeliness that is neither anticipated nor awaited. Much like Simondon, Fanon's leap bears a margin of indeterminacy, eschewing schemas of perfection to continuously force an uncertain scission into the weave of History, and making a radical break with the predetermination of the myth of the Negro that characterizes the integral function of Blackness. Unlike Césaire, who finds solace in a "bitter brotherhood" that maintains the rigid history of ontic relations, Fanon's leap seeks a crossing, beyond which the object is no longer a guarantor of subjective security, but a radical dislocation that unsettles the fictive stability forged by the transindividual image of Blackness coerced and compressed into a definite integral. Invention seeks to unsettle those boundary conditions locking the Black individual inside the body as a product of history by restlessly animating the "untimeliness of blackness."[57] This untimeliness is, for Fanon, the origin of the subject—a system of formative symbolizations by which the subject is presently bound, but must overcome through invention.

Option J: The Technician

> "Philosophy is made synonymous with the leap, once it is made to be one and the same reflexive operation."[58]

Together with invention, the second untimely figure is the technician who, in distancing themselves from the collective, is able to mediate between the community and the "hidden, inaccessible object."[59] Technical activity is the domain of a "pure individual," capable of taking current modes of functioning and transforming them in excess of existing community relationships. While technical invention renders a technical object that resolves problematics at the level of human reality, through that which Bardin determines is a "maximum of implementation of the system with the values conveyed by technicality," technical life exists at a level of immanence with the relation between epistemes, integrating them into society during their operation and guiding their homeostatic functioning in relation to each other.[60] The technician's invention thus occurs as an event in which culture becomes an open machine rather than a closed system made functional by setting stable bounds. Furthermore, technicity at the scale of the collective occurs in a functional domain between the individual and the social system, as the technical object augments and invents potentialities present in the environment, producing new schemas of values and norms as well as social possibilities. The technician thus overcomes the alienation of the human–technics dyad, guiding the object in an application that resolves the problems present prior to its invention.

If the invention of a new technics is to truly result in the

invention of new values that are in excess of verisimilitude, then the Black individual must be ontologically destabilized, encouraging them to modulate within the problem domain. We argue for an application of language as that which contains the potential for a breach in racial perception from within the variable tensions of the pre-individual milieu. This new language structures and reveals the logics of individuation and individual formation, presenting a potent possibility for the production, or invention, of new images or groundings of Black perception. In doing so, language uncovers the imago of Blackness as the product of a perceptual system necessitated by the incoherency of white identity, in which the Black being emerges not only as a condensation of the epistemological shadow of European *humanitas*, but as a boundary condition for the production of subjectivity within an economy of being that continually abrogates the possibility of Black being.

While the process of invention materializes as a model of disparation within the individual, which, in interaction with the milieu, provides an allagmatic explanation for the restructuring of the subject–milieu relationship, what is sought is no less than a psychic poiesis: a production of new internal structures in a psychic individuation which Simondon terms a "dilation," whereby the affective and perceptual problematics of Black individuation are resolved through a reflexive act that is at once an internal renegotiation and expansion. The ontogenetic leap is prefigured by a topology of the Black individual as temporally constituted between the historical as an "interior past" that must come into confrontation with an exterior milieu, ultimately reinventing its conditions—or what David Marriott outlines as "foundational claims of both history and politics in so far as both rely on the racial invention of the human and of humanism as such."[61]

Simondon's demand upon a genetic account of the development of perception distinguishes him from the Kantian transcendental aesthetic while simultaneously opening up the role of affectivity in conjunction with the individual's exterior, allowing invention to emerge as an adaptive intervention into technical activity both as "operator and object of the operation," modulating "internal structures." Simondon describes the process as a play of limits, the overcoming of which, he suggests, "can occur only as a leap, as a modification of the internal distribution of functions, a rearrangement of their system; what was once an obstacle must become the means of realization."[62]

Option K: A Calculus of Variations

How might we then engage with the act of invention towards a rearticulation of Black individuation within a metastable racial system? To challenge the problem of race we must embark on a fundamental revaluation of the values that form individual and collective perception. We must bring to light a notion of political subjectivity that does not organize at the threshold of existing perceptions of difference, but instead releases the energy from this interaction to form a potentially new individual and collective being.

Here we argue for an understanding of this problem as a calculus of variations. The calculus of variations is a subfield of mathematical analysis that uses variations, or small changes in functions, to map a set of real numbers by finding the maxima and minima values of functional or definitive integrals. The primary concern of a calculus is the behavior of a given class of functions, whereby the global behavior of the curve (the absolute) is defined by maxima and minima boundary conditions modulated by the interval created between them. In mathematics, an integral, as such, assigns numbers to functions in a way that describes displacement. A function, on the other hand, is an action or activity that is assigned to, required, or expected of a person or group.

While mathematically, calculus is concerned with limits, and with the differentiation and integration of functions, or the activities either assigned to or required or expected of an individual or collective object, a calculus of variations denotes the relationship between the calculus of extrema: the uppermost limit (maxima) and smallest possible quantity (minima) of definite integrals. The distinction is important, as the calculus of variations is a tool used to solve a specific set of problems. A calculus of variations seeks to resolve those problems involved in finding stationary values of a functional domain, or a domain whereby a series of actions unfolds to establish a relation such that one thing is dependent on another. In other words, a calculus of variations is a process by which small changes in function (discrete actions) can be mapped across a topology ("mental world") to find the maxima (uppermost limit of potential) and minima (boundaries of racial perception) of definite integrals (image of Blackness). A definite integral (commonly known as the Riemann integral) is itself comprised of upper and lower bounds, giving form to an interval within which change at the level of the function can be calculated. Such integrals are representative of essential or "built-in" properties of extrema within larger calculable systems of dependence, and are key to understanding the global dynamics of system formation, here defined as the metastable racial system.

An exposition of the production of the image of Blackness as an integral value has bought to light underlying logics orienting the development of interindividual relations that produce the transindividual load borne by the Black individual. The process allows for modulation between the maximum values of Black perception (as defined by the substance of race) and the minimum structures of negation within the problem domain (or the domain of the

minima). This is achieved through successive individuations of incompatibility towards a recognition of the potential for self-determination.

Just as "the technician loves the matter upon which he acts," the Black individual must thereby openly enter into negotiations with an inherent calculus of variations in order to map the topology of racialized domains.[63] Although the calculus of variations might appear to be a stable system, it is preconditioned by the potential for change, even if small in scale. Change, in this sense, is a signal or alert that indicates the maximum and minimum values of the system—which itself is in contradiction. By this we mean that the system is strained by its precondition for variability, given any small alteration of the conditions that reside within the metastable system. This cannot be achieved without a sensitivity or awareness of the "mental state" or maxima and minima values that define the boundaries of the system in question. A sensitivity, as a topology of Black individuation, catalyzes an extension of the maxima boundaries towards a rearticulation of the internal system relations. Sensitivity, signaled by the individual's modulation between the maxima and minima boundaries of the system, reveals the quality and fragility of the system's present form. The amplification of the tension between present conditions and potential conditions brings forth a threshold through which change can be initiated, as already made possible by the system's existing reliance on small changes as the defining characteristic of the system.

While the system might appear to be unmalleable, it is what Bernard Stiegler describes as "performative," that is to say, it is what it enacts or the actions that it carries out.[64] The system is therefore operative, and accounts for both the convertibility of structure and the invention of new structures. To formulate this process as a process towards Black individuation dramatizes invention as the direct grasping of the problems of race in its own assumptions, thereby decentering any preexisting image of Blackness and permitting alternative versions of reality. It is here that we are able to appreciate the latent potential of Black existence as that which is in excess of any externally composed image of truth. It is here that, we posit, Black being emerges as that which characterizes a proficiency of this technique or practical skill—a mode of invention that brings forth an absolute value of self-love and actualization. A subject in flux, and making compatible in practice any prior incompatibilities. What remains is that which escapes, if only for a flashing moment, in its relation to the negative images of Blackness and the overtly symbolic *négre*. This excess is a conversion of small to large actions towards the invention of a new form and the coordination of new stages of individuation.

X

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Bernard Stiegler, *Acting Out*, trans. David Barison, Daniel Ross, and Patrick Crogan (Stanford University Press, 2009), 6.

Doreen Mende

The Code of Touch: Navigating Beyond Control, or, Towards Scalability and Sociability

> I sell the shadow to support the substance.
> —Sojourner Truth, 1864[1]

Imagine a seven-year-old girl during a recent warm spring Sunday afternoon, daydreaming while standing at the window of the loggia on the third floor of her family's apartment in the city center. The loggia faces the backyard, so the girl looks into the backyard's garden. She arrests her gaze on the moving leaves of a horse chestnut tree in front of the window, and moves on to rest her gaze on the parked bicycle of the neighbor's daughter, her best friend. She spots a black-and-grey cat walking across the green lawn towards the bicycle rack that frames the grass. The girl from the third floor wants to get a closer look at the cat.

She wants to rescale the cat so as to bring it from the distant backyard into the proximity of her eyes, which leads her to a techno-physiological automatism that she has internalized as a mental apparatus: While she looks from her window down into the garden—the window framing and fixing her gaze—she carefully touches the glass with her thumb and pointer finger as if it were a touchscreen. (Remember that the touchscreen became a globally popular technology in 2007.) The girl spreads her two fingers, moving them back and forth in what is called the "pinch-to-zoom" gesture, until she realizes that the glass she is looking through is not the touchscreen she was looking at just before. For a second, the girl loses her sense of orientation. Her feet re-ground quickly, yet articulate the need to seek another point of orientation. This is a condition that she shares with both the world-destroyer and the world-maker.

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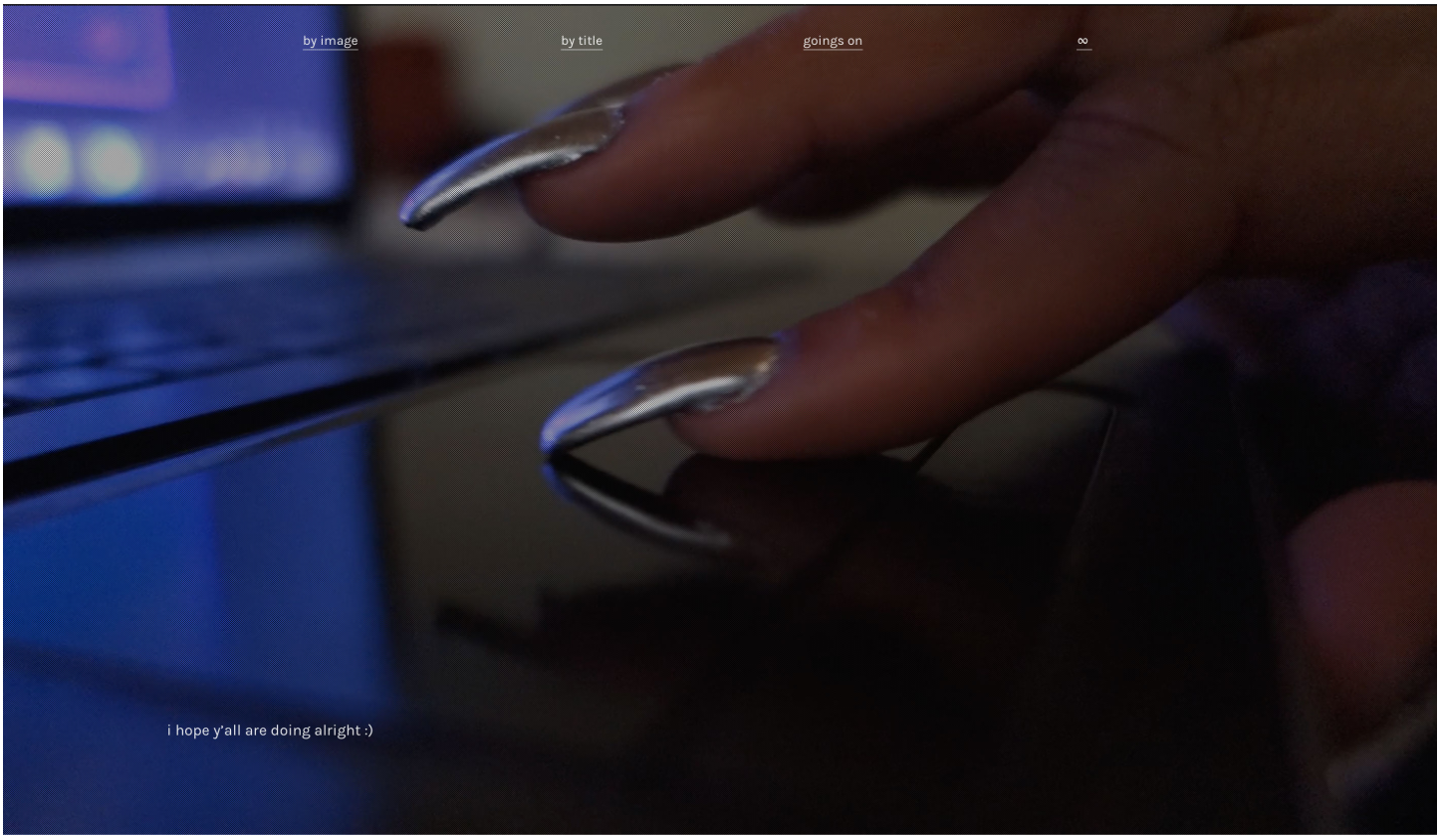
The pinch-to-zoom gesture is one of hundreds of patented finger movements for navigating one's gaze on the touchscreen. It mobilizes the screen, transforming it into an "actionable image"[2] whose dromological violence[3] puts unbearable pressure on the emancipatory potency of thought that possibly resides in the exposure of an image as slow as an idea emerging from both inside *and* outside the image-frame. Yet, under conditions of navigation by means of computer-generated images, there is no more outside. Or rather, one has to look hard for an outside, reminiscent of how outer space seemed to be brought under control by the public circulation of the composite image of the earth as a blue marble on November 10, 1967. Under computational navigation, there is only an excessively nervous update of the frame that keeps the screen operator—finger and gaze—inside its

image-space. The frame seems to become invisible under the pressuring premise of the inhuman commanding the frame's infinite update, which transforms outside-matter or outside-life into an object of ignorance, protecting the single image's sovereignty.[4] Computational navigation engenders, as we will see, the capacity to destroy or create a world: If computer-generated images constitute the "ruling class of images" today, as Harun Farocki notably suggested, thus implicating the image viewer—or image navigator, a.k.a. screen operator—in the "production ... or creation of a model world," then how could we make sure that navigation does not re-model a world of class relations? Or, to ask the question differently, how could we—artists, theorists, filmmakers, coders—mobilize the "actionable image"—as an image of this ruling class of images—to navigate against its own ruling power?[5] Could images as navigational tools create a better world, against or below the tools' invisibilizing violence within this existing world? In other words, the girl at the window wants to make sure that we do not leave navigational tools to the world-destroyer. Instead, she wants to learn to make worlds, not only one universal world that the imperial navigator has claimed, but rather many worlds.

I will mobilize this approach by way of an utterly fragmented thought experiment, towards the urgency of *unlearning* the imperialism of navigation regarding computer-generated images as navigational tools. I will try to embark on some methodologies of "unlearning imperialism" through the recent writings of theorist, curator, and visual activist Ariella Aïsha Azoulay, who calls for a pedagogy of unlearning in regard to the imperialism of photography. The act of unlearning demands, suggests Azoulay, that we understand our own implicatedness in the histories of domination, which she describes as "our violent commons"; unlearning means foregrounding incongruences, such as "realities not aligned with concepts used to account for them"; unlearning means trying to transform such a troubled commons into a shared concern for making a common world.[6]

The pinch-to-zoom finger movement demonstrates the navigability of the image under conditions of *computer animation rules*.[7] This gesture suggests a geospatial imaginary of world-making that fits onto the tips of two fingers, which scale the measurement at a distance into an "extreme proximity," to use the words of artist-researcher Oraib Toukan.[8] Since 2007, the touchscreen has become a popular display technology to zoom into a detail or set a focus on an image, to operate GPS maps or to order food via the phone. Hundreds of patented gestural movements for navigating, steering, and moving the image surface in real-time mark the scalability of the gaze by means of touch.[9] These gestures have composed a sensory-motor vocabulary of the body, more specifically, of the finger's tactile capacity that mobilizes the touchscreen interface as a display for becoming present within a world, yet without one's own body. In the past, the gesture for picturing an image used to be expressed as a frame: the thumb and pointer finger of each hand, both spread apart to form an L shape, would form a pictogram marking the frame. It was an unambiguous sign—a representation of the image-cum-frame in which the view onto the world had to fit.[10] Yet, the pinch-to-zoom gesture does not represent but rather exhibits or demonstrates the *code of touch* for operating the image within a navigable field—towards a geospatial imaginary beyond the limits of a static frame. The pinch-to-zoom gesture, which operates through the code of touch, recalibrates the frame continuously. Any seven-year-old child today whose parents have a smartphone has internalized this code. "The touch," as Harun Farocki narrates in his film *The Expression of Hands* (1997), "originates in the casting of spells. The magical heathen object intended to be enchanted was only touched, not handled or held." The touch is the least of all possible labor-exhaustive activities— *kinderleicht* in German, or, as light as a child's muscle power—for scaling the eye's distance while watching a cat, or for steering the gaze around an object of desire that can never be owned yet is possessed by the touch-steered gaze. Once the gesture turns into the linkage between two worlds—for example between those of the girl and the cat, or between the disciple and God—the sensory-motor gaze is as uncannily easy as the most powerful tool of control.

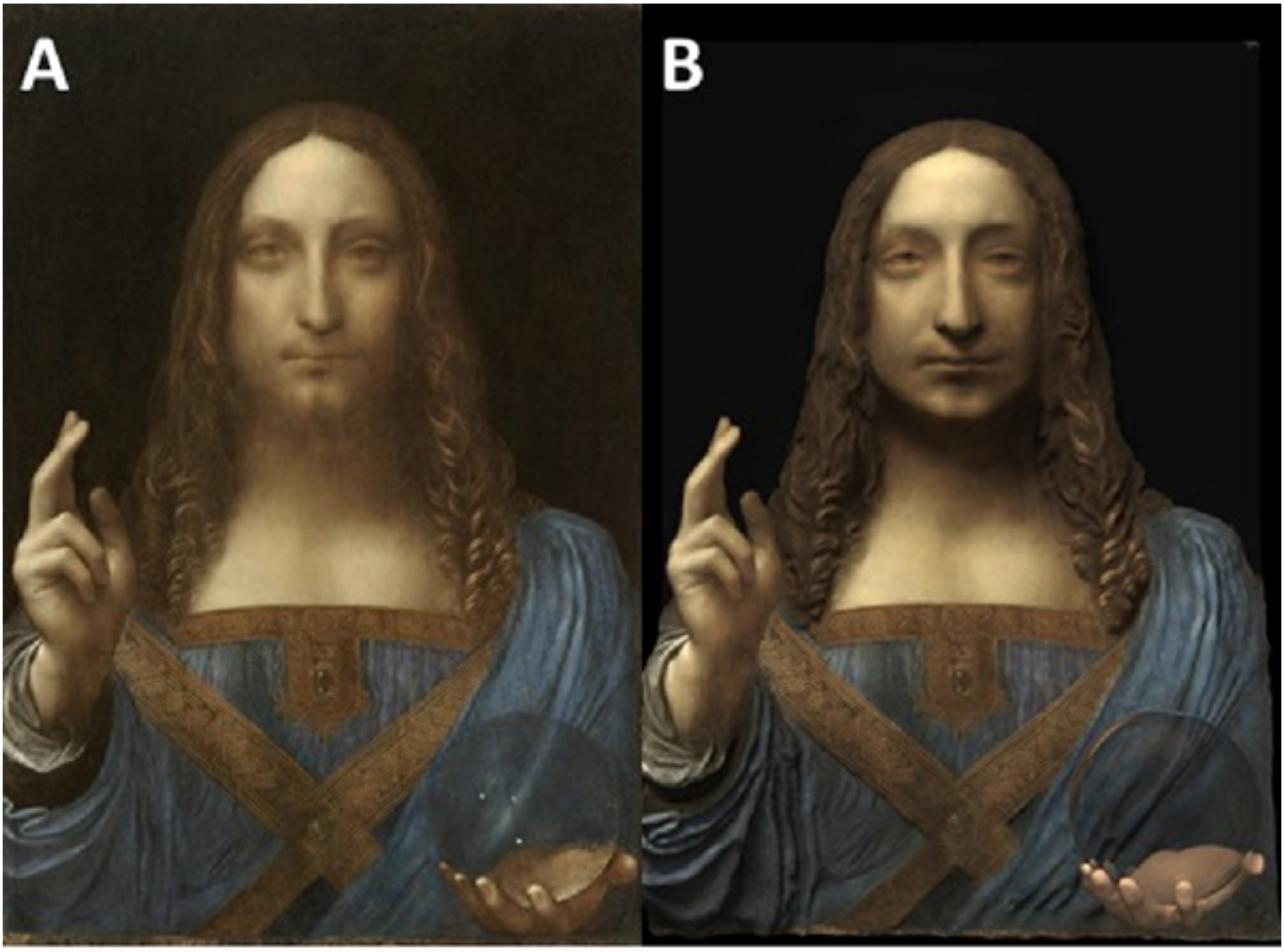
Regarding the magic touch as tool to navigate the gaze: Christianity has built its imperial power on the magic capacity of touch to animate a single image—the cross—as a world-making device. Each time, when the priest live-gestures or live-paints the cross icon into the air to steer or navigate a human creature's banality of life on earth towards the Kingdom of God, God's imperial power appears before the front of our eyes. Each time, this gestural hand movement reconfirms the building of a world within the existing one. This universal world-making within the existing world is visualized, for example, the Renaissance painting *Salvator Mundi*, likely painted by Leonardo da Vinci or his workshop around 1500, which registers—not by coincidence—as the most expensive painting ever sold. In 2017, an auction house in New York sold it to Prince Badr bin Abdullah bin Mohammed bin Farhan Al Sau, who is also the minister of culture of Saudi Arabia, for $450.3 million.[11] It is no surprise that the buyer, alongside his involvement in the oil industry and real estate business, is also a primary stakeholder in media companies. The painting was realized during the Italian Renaissance (Quattrocento), which in Europe marked the transition from the Middle Ages to the colonial matrix of imperial modernity. Its title, *Salvator Mundi*, speaks first of its religious context. Yet also at stake is nothing less than the world itself: making a world within the already existing world. Divine redemption comes through the expression of the savior's right hand—more precisely, through a half-open hand gesture with the pointer and middle fingers stretched out in order to bless the earthly sinners on the other side of the canvas. The fact that French king Louis XII commissioned the painting from da Vinci



Artist Sondra Perry website's landing page.

(assumingly) does not only speak to the proximity between Christianity and monarchy, but also invites speculation about the visual conditions of world-imperial imaginary preempting the First French Colonial Empire of the sixteenth century. One had to imagine a world before governing the world, before destroying the many different worlds within the existing world, before dispossessing the lands of these different worlds in the name of Christianity—fostering the cruel construction of colonial modernity, orchestrated by an arsenal of hand gestures navigating the organization of the gaze. Recent studies performed by computer scientists have revealed that the translucent orb in Salvator's left hand is not made of crystalline solid, and is thus neither a crystal sphere nor a globe, but a 1.3 mm thin hollow glass ball.[12] It's reasonable to wonder whether the painter planted a subtle criticism of Christianity's universal world claim into the painting, or whether it depicts a future dome for the king to fill. From today's experience of navigating the visual screen through multi-touch gestures, the hand gesture of Trinitarian blessing, which symbolized the expression of amazement or wonder in ancient iconography, resembles various kinds of gestural movements such as the "double tap" or "press and tap," which can be found under the "Trackpad" section of your MacBook's system preferences. The code of touch programs the brain into a screen for producing a world.

Gestural recognition, or the touchscreen techno-sensorium, is one of many ways to navigate the image. Moreover, the use of images as navigational tools is not new. Ute Holl reminds us, for example, of the imperial dimension of the cinema and cybernetics. She points us specifically to the weaponization of image technologies during the Second World War, when "camera and radar eyes on airplanes and machine guns could not only record and transmit visual material, they could also calculate trajectories and guide projectiles," leading to a militarization of the gaze.[13] In this context, cybernetics was constitutive of a theory of communication under the conditions of the war against communism in the postwar world. Transdisciplinary exchange between neurological and mathematical research optimized military actions and protocols of control, with navigation guiding the hands—in small-scale tacticle movements—of soldiers, scientists, technicians, and politicians seeking to destroy the world from an extreme distance. Concretely, in *War at a Distance* (2003), the filmmaker and writer Harun Farocki describes the "HS 293 television bombs" of the early 1940s, developed during the Second World War by an Austrian scientist of aerodynamics for Nazi-German aerial warfare.[14] The television camera–guided bombs, which were used as anti-ship missiles, confirm the conjuncture of cybernetics, militarization, and the image regime. If the code of touch, as described above, programs the brain into a screen to



Left: A reproduction of Leonardo da Vinci, Salvator Mundi, c. 1500; Right: A virtual model of da Vinci's Salvator Mundi rendered using approximated geometry in Maya, a 3-D modeling and animation software, in order to experiment with a variety of configurations for the orb. This model was developed by computer scientists in the University of California, 2018/19.

project images that kill (hence, that not only produce but also destroy the world), then the human capacity of looking cannot be subject to psychology alone but also involves technology and politics as part of its ontological-epistemological fabric. Knowledge and the conditions of knowing are both at stake. Like the girl at the window in the tale that begins this essay, we can't leave technology to world-destroyers. Across our various practices, we have to research methods, vocabularies, and means for mobilizing a "psycho-technology" of images that can be navigated—images for *being* in this world, and for finding our way to the end of it. As Fred Moten has said, "I believe in another world in the world and I want to be in *that*."[15] To put it differently, the touch-steered gaze points us to the scalability of geopolitical relations stretching locality towards globality, and vice versa; it also assists in the conjuncture of two principle operational fields—human and machine—that usually remain separated through their own singular politics of matter, time, and space. This throws us in the middle of navigation as an ontological challenge: What would anti-imperial world-making look like? This calls for rehearsing the practices of unlearning: always already existing acts of resistance have proven that they can mobilize the means for world-making within the existing world *despite* technology's genesis from cultures of imperial violence. For example, in *Potential History*, Azoulay writes that the camera's shutter, a fundamental device of photographic production, exemplifies the extreme violence of photography: *while* the shutter is pressed, those potent histories that are unexposed to the light remain uncaptured. This *while*, I argue, speaks of a chronopolitics of uneven histories. Azoulay states that unpacking these uneven histories is crucial to the labor of unlearning photography's imperialism. Still, the shutter does register shadows, and these shadows are the inscription of a

fugitive knowledge that evades the shutter's control. In this sense, shadows figure social practices of emancipation from the violence of "white science's" color balance.[16] Reading Azoulay's book made me remember page forty-two of Teju Cole's *Blind Spot*, where he writes about Sojourner Truth.[17] In 1864, the abolitionist and feminist Sojourner Truth became the first person to publicly claim control over the political economy of her photographic image.[18] In this well-known image, she is portrayed sitting at a table, likely in a photographer's studio in Detroit. She pauses her knitting to allow the (unknown) photographer to take the picture of her; her gaze is directed at the camera, and thus the viewer, establishing a tripartite contract between herself as the photographed, the camera operator, and the viewer. At the bottom of the image (which exists in several layouts), Truth had the following sentence printed: "I sell the shadow to support the substance. SOJOURNER TRUTH." The term "shadow" is a colloquial word for the photographic image, yet it also frames Truth's pioneering courage to speak up, by means of photography, for her rights against the colonial matrix of power. Her statement about "selling the shadow" speaks of her rights to the image, both socially and materially. She owns not just the photograph, but her *image*, with the right to mobilize its value-making capacity to support her community. She has been portrayed sitting there by herself, yet she is not alone. In other words, the world of black feminist thought always already existed, despite photography's capacity for a structural violence that installs a "differential principle" (Azoulay), creating a world where race and gender operate as value-making systems that serve the logics of racial capitalism. Today, we know about photography's imperialism and capacity to make (or destroy) worlds. Sojourner Truth pioneered the practice of turning photography against itself, a few decades after photography was invented as a technical apparatus, in order to "sustain the substance," that is, to speak to a substantially real world within the cruelly constructed existing one.[19]

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> They flow into our life montage, becoming the visual common through which we converse, the archive or inchoate lexicon of our expression.
> —Jodi Dean, "Faces as Commons," 2016[20]

Imagine another Sunday in spring. This time, it's early evening. Rain hangs heavily in the grey cloudy sky. The air is filled with a friendly breeze before the thick drops of rainfall to wet the walkway framing the plot of grass in the building's backyard. The rain fills the horse chestnut tree's flowers—which the girl she has learned to call " Kastanienkerze *," horse chestnut candle—with minerals and nourishment for its spring growth.*

The girl has grown older. She is now twelve years old. She is on her own, but not entirely alone. In the next room, her mother is writing an essay for an art journal while her father prepares dinner. It is about 6 p.m. The girl is bored. She might help her father in a moment. But first, she takes her mother's phone and plays with the MAD Arts app that her mother downloaded a while ago, initially for her daughter to use, but the mother has come to enjoy it too. The app allows you to create a proxy face for yourself, which will appear instead of your actual face when you video-call your friends, your relatives, or yourself (you can make the proxy face appear without calling anyone).

The girl had watched Avatar *(2009) the week before. She vividly remembers Neytiri te Tskaha Mo'at'ite, the Na'vi tribe princess of the Omaticaya clan. Neytiri becomes the model for her proxy face. Blue skin. A well-formed, not-too-pointy nose. Large yellow eyes. Long, dark brown hair, braided into several small plaits that nestle against the head on both sides. She also chooses an elegant pair of earlobe plugs, similar to those of Neytiri. The girl enjoys smiling, moving her mouth as if she is speaking, raising her eyebrows as if she is surprised, making impish expressions—all to let the app's facial-recognition software modify her portrait into a proxy face. She likes to take a picture of herself as "Neytiri," which she then sends to her best friend, who sends back her own proxy face.*

This time, though, something unexpected happens. Her mother must have updated MAD Arts recently, because when the girl switches from the front-facing camera to the back camera—which usually captures the space in front her—she still sees herself on the screen, but from behind! She is looking at the back of her own head! How is this possible? Somewhat anxious and scared, she looks at herself from behind like the figure in René Magritte's La reproduction interdite *(1937). She looks at herself from an outside of sorts, yet she remains inside the frame. She pinch-zooms, smart-zooms, rotates the phone—nothing helps. The black mirror of her mother's phone has inverted its function, from an interface that serves as a portal of connectivity to the world outside, to an intraface: an internal interface that mirrors the girl from an imaginary outside, never allowing her to get out, or confront her face as common anymore.*[21]

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What could a practice of politicizing the image in the twenty-first century look like, considering that navigation—the computational condition of contemporary image-processing—updates, calculates, and incorporates the frame excessively and continuously into the image-making process? In order to render more palpable the beginning of a political ontology of image navigation by means of computation, we should remind ourselves of the principle of twentieth-century montage, which can offer a potent point of departure. Much has been written and produced in the name of montage . In 1967–68, film

students, including Harun Farocki, announced the *Dsiga Wertow Akademie*, an occupation of their film school, the German Film and Television Academy in Berlin, an act that paid tribute to montage as a cine-political practice. Montage was pioneered by Esfir (Esther) Schub and Dziga Vertov, emerging from the world of Soviet cinema during the period of the Bolshevik Revolution of 1918. In other words, montage's potency to mobilize the image for emancipatory processes was initially built from participation in communist world revolution. Would the latter reason, therefore, to consider the tripartism *image–navigation–militarization* (as mapped above) as constitutive for the navigable image to contribute to the "east-west formula" (Ute Holl), and thus to foment a global war *against* the world of communism? Does this "actionable image" uncannily complement the end of communism after 1990? Does this image, serving as a representative of the new ruling class and global capitalism, visually express the defeat of an originally world-revolutionary project? How do we mobilize navigation against its initial commitment to a capitalist modernity—disrespecting, refusing, and thus unlearning, its imperialism? A brief look into the montage principle might allow us to understand better what we have lost, or rather, what image-making elements need to be rearticulated through the navigability of the image.

Dziga Vertov's proposal of montage as "interval theory" renders the frame an absolute necessity for organizing the movement of images into phrases, narratives, statements, and manifestations within a durational sequence. The frame marks the space-time between images and sounds; hence, it marks the excess of the seen—a space in which there is always already more to see beyond control. While editing tries to compose a narrative from images as smoothly as possible, montage insists on making the moments between frames palpable.[22] The visible materialization of the frame institutes the image as a working instrument that creates a space-time of thought "from which some third *thing* [is] meant to emerge and which was conceived as a substitute for thinking," as Ute Holl writes.[23] It turns the image viewer into an image-thinker-cum-worker: she does not only watch the image at some distance from the screen, but she also "sees" the excess of the seen residing in the outside world. For example, in a 2019 episode of the television series *Black Mirror* entitled "Striking Vipers," the main characters, Danny and Karl, need a frame in order to move from their living room into the VR world of martial arts and female sexuality. They need a portal, a frame, to enter the world of *pure desire* that, once they have arrived in it, moves as framelessly and seamlessly as possible. In the episode, one could argue that the role of the frame is played by the neural virtual gaming device called the Experiencer Disk: a small, round, button-like VR device that Danny and Karl attach to their temples in order to start playing the VR game *Striking Vipers X*, and that allows them to navigate the image in order to enjoy a world with "the best sex ever." Once within the navigable field, the frame needs to become invisible. It needs to extend its borders beyond the eye's capacity for controlling the field of vision, so that this new world can unfold into "bubble vision," as Hito Steyerl describes the navigational gaze.[24] Operated through the fingertips as they manipulate a joystick or a touchpad, the "bubble vision" is missing legs and arms, transforming the gaze into a gaze without organs, but one ruled by desire. It produces a model world that does not ultimately survive in the real world; however, this world nonetheless exists. Do we always have to search the navigational landscape for a frame of sorts, even though such a thing is supposed to remain invisible?

In contrast to Vertov's rather clinical approach, the filmmaker and editor Esfir Shub developed her understanding of montage through the practice of collective filmmaking, in which women—whom she calls Монтажница, or *montazhnitsa*—performed the editing work. Shub, whose writings have hardly been collected into a book yet, emphasizes the actual working conditions of editing itself: the agitative-educational function of the image does not begin in the moment of public projection, but in the editing room. "One more thing about *montazhnitsy*," wrote Shub. "This collective of women workers delights us with its political harmony, social activism, and a sense of absolute camaraderie toward one another."[25] We might have lost the frame's first imperative that confronts us with the limits of our knowledge—in other words, our own ignorance. But there is always a "meeting of two lines" that simultaneously separates and connects the single pixel, as the artist and research Oraib Toukan argues. I agree: computer-generated images still have a frame—thousands in fact, marking the "archetype of the sovereign," as Toukan writes.[26]

Toukan's desktop video *When Things Occur* (2016) is a wonderful example of taking a close look, rehearsing a certain intense proximity to the pixelated interface-frame that communicates Gaza to the world. In the video, Toukan has a series of conversations with several Palestinian photojournalists reporting on the war in Gaza in 2014. "The images that leave Gaza are always taken in hospitals or destroyed homes," says photojournalist and writer Lara Abu Ramadan. While we hear Abu Ramadan's voice, we see a kind of Photoshop animation of a photograph showing a living room under attack. The attack unfolds in a stuttering movement, caused by the limitations of the computational space. The image of the attack is dragged and dropped by a hand icon, which moves the file around and beyond the frame. Several sequences of *When Things Occur* show these types of photographs as raster graphics, revealing thousands of pixels separated from / connected to each other by a tiny thin line. Here we are; the frame exists. By seeing it, the vicious circle of reproducing the violence of victimization by means of digital circulation turns into a discourse, an analysis, and an infrastructure for conversation. One can see these tiny frames by zooming into the digitized or computer-generated image, as if looking behind the scene

Danny Parker (acted by Anthony Mackie) enters the VR-fighting game Striking Vipers X, in the episode "Striking Vipers," Black Mirror (2019).

from the front; the extreme close-up disrupts the image's representational function by imposing its own conditions of producing a discourse of abstraction. However, I wonder if the extreme proximity, which aims to create a more navigable field, also threatens to cause a kind of "acute myopia," in the words of Reza Negarestani.[27] To put it differently: yes, there might still be a line operating as a frame of sorts within the navigable image. But computer animation rules call for *scalability*—perhaps like the seven-year-old girl who confused the window for a touchscreen and tried to rescale the cat to bring it closer. First, the zoom-in that reveals the single pixel's frame introduces a molecular scale of the image as abstraction. Second, the excess of the thousands of pixel frames per centimeter (pixel density) introduces a mass scale of practices of mediated communication. Therefore, this tiny, thin, separating-yet-connecting line, which only becomes visible in "extreme proximity" by using image-processing software to scale the image to reveal microscopic detail, enforces a "labor of invisibility."[28] Furthermore, computer animation rules also call for *sociability*. In this context, Esfir Shub's invocation of "social activism" and "absolute camaraderie" resituates our focus onto the labor conditions that constitute the image's politics: Can we mobilize the navigable field towards collective/social practice precisely by pointing to the actual working conditions of the navigable image, including its limits, horrors, and possibilities? This question brings us back to the urgency of unlearning the imperialism of navigation in visual-computational terms. Several contemporary works of art/research propose possible entry points for this approach, by resituating the "labor of invisibility," bringing it within the invisible frame.[29] This does not render visible the invisibilized or give voice to the silenced. Rather, it rearticulates the enmeshment of technology with politics, violence, images, and labor.

If the navigable or "actionable image" speaks from the ruling class of images in the twenty-first century, then we ought to move towards a *potential present* of navigation that rehearses methods of resituating computational image technologies against its imperial violence, "without forgetting, even for a moment, to what extent imperialism conditions us and invites to act as its agents."[30] Navigation puts pressure on the possibility to set thoughts free, to think outside of the box, and to unlearn the colonial matrix of the modern knowledge system. Therefore, the question here is not only *who* the workers are under computer animation rules, but also *where* the workers are on the measures of scale between extreme distance and extreme proximity of world-making. Navigation beyond control invokes thought-turbulences as well as awkward gaps; it calls for social activism while navigating as a mode of making. For embarking on such world-modeling, the tasks for operating today's navigable images entails learning to articulate the feedback loops, back and forward, between the code of touch that steers the gaze and formats the brain into a screen; it fosters the conditions to confront the horror of immersion and to collectivize the politics of invisible labor across many locations, as planetary computation pledged, towards a possible anti-imperial navigational landscape.

X

This text is dedicated to filmmaker, writer, and friend Harun Farocki (1944–2014). I would like to thank Julieta Aranda, Kaye Cain-Nielsen, Kodwo Eshun, Brian Kuan Wood, Charles Heller, Tom Holert, Volker Pantenburg, and Susan Schuppli for conversations on navigational problematics, as well as the students in the CCC RP Master Program at HEAD Genève, specifically those participating in the Curatorial/Politics seminar researching the question "What is Navigation?"

Doreen Mende, curator and theorist, is currently professor for Curatorial Politics and head of the CCC Research-based Master and PhD-Forum at HEAD Genève/Switzerland. Recent curatorial projects include "Hamhung's Two Orphans" for Bauhaus Imaginista at Garage Museum of Contemporary Art in Moscow, 2018; "The Navigation Principle" at the Dutch Art Institute, 2017; "The Prisoner Letter" at Khalil Sakakini Cultural Center, Sharjah Biennial 13 Offsite in Ramallah, 2017. Since 2015 she has been a founding member of the Harun Farocki Institut in Berlin.

1
Quoted in Teju Cole, *Blind Spot* (Penguin Random House, 2017), 42.

2
Harun Farocki proposed the notion of the "actionable image" in his lecture "Computer Animation Rules" at IKKM in Weimar on July 7, 2014, after encountering Alexander Galloway's concept of the "actionable object" in his *Gaming: Essays on Algorithmic Cultures* (University of Minnesota Press, 2009).

3
In *Politics and Speed* (1977), Paul Virilio develops the idea of "dromology," which he defines as the "science (or logic) of speed." He uses the term in the context of discussions about technical vitalism and the militarization of society.

4
Introducing the notion of inhuman here relates to Reza Negarestani's proposal of "inhumanism," or the machinic, which, as I understand it, suggests an approach to unsettle the humanist imperative of European enlightenment, or the *anthropos* , in relation to a politics of thought as a modern system of knowledge.

5
Farocki, "Computer Animation Rules," 2014.

6
Ariella Aısha Azoulay, *Potential History: Unlearning Imperialism* (Verso, 2019), 38. In this book, Azoulay argues that we need to re-historize the invention of photography, seeing it as not solely a technological medium, but as an instrument of domination employed by the centuries-long, massive violent projects of imperialism, colonialism, and slavery.

7
Harun Farocki, "Computer Animation Rules," 2014.

8
Oraib Toukan, "Toward a More Navigable Field," in "Navigation Beyond Vision, Part 1," ed. Doreen Mende and Tom Holter, special issue, *e-flux journal*, no. 101 (June 2019) https://www.e-flux.com/journal/101/272916/toward-a-more-navigable-field/ .

9
In February 2008, less than one year after Apple introduced the multi-touch technology for consumer products, around two hundred patents had already been filed for the iPhone alone. See Bryan Gardiner, "Can Apple Patent the Pinch? Experts Say It's Possible," *Wired*, February 2008 https://www.wired.com/2008/02/multitouch-patents/ .

10
Harun Farocki uses his hands to form a frame in many of his films—for example in *Interface* (1996) and *The Expression of Hands* (1997). The frame-gesture also plays a role in Abbas Kiarostami's *Life and Nothing More* (1992).

11
The current whereabouts of the painting reads like a detective story of the global art trade. It was meant to be on display at the Louvre Abu Dhabi in 2017. Yet so far it hasn't turned up. Some stories say that it has been exhibited on Prince Badr's yacht. It has also been reported that the real buyer behind Prince Badr is Mohammed bin Salman, the crown prince of Saudi Arabia and the deputy prime minister of the country.

12
Marco Zhanhang Liang, Michael T. Goodrich, and Shuang Zhao, "On the Optical Accuracy of the Salvator Mundi," December 2019, arXiv:1912.03416.

13
Ute Holl, *Cinema, Trance and Cybernetics* (Amsterdam University Press, 2017), 74.

14
In *War at a Distance* (2003), Harun Farocki shows images of a test flight involving the television bomb, and states that it was never used in combat.

15
Stefano Harney and Fred Moten, *The Undercommons: Fugitive Planning & Black Study* (Autonomedia, 2013), 118.

16
The art critic Brian Wallis analyzed daguerreotypes portraying slaves named Renty and Delia in South Carolina in 1850, taken by a Swiss photographer who sought to justify racial segregation by visual means. See Wallis, "Black Bodies, White Science: The Slave Daguerreotypes of Louis Agassiz," *Journal of Blacks in Higher Education* , no. 12 (Summer 1996): 102–6. (To deprive him of the valorizing economy of visibility, I cross out the name of the Swiss photographer, whose name still adorns streets and mountains in Switzerland. Thanks to antoine simeão schalk for alerting me to the latter.)

17
In addition to Cole's book, see Sojourner Truth, *Narrative of Sojourner Truth* , 1850.

18
Azoulay mentions but does not elaborate on Sojourner's act of speaking truth to visual power. But she does discuss the lawsuit that Tamara Lanier brought against Harvard University regarding the 1850 photographs of Renty and Delia, who she claims are her ancestors. See Azoulay, *Potential History*, 146.

19
See Glenn Ligon, *I Sell the Shadow to Sustain the Substance* (2006), a neon light installation inspired by Sojourner Truth.

20
Jodi Dean, "Faces as Commons: Secondary Visuality of Communicative Capitalism," *Open! Platform for Art, Culture and the Public Domain* , 2016.

21
The vocabulary used here is adapted from Alexander Galloway, *The Interface Effect* (Polity, 2012); Benjamin Bratton, "The Interface Layer," in *The Stack: On Software and Sovereignty* (MIT Press, 2015); and Jodi Dean, "Faces as Commons."

22
"Montage is noticeable as montage, editing tries not to be noticed."—this is how Harun Farocki summarized the East-West formula for West Berlin students. Quoted in Holl, *Cinema, Trance and Cybernetics* , 27.

23
Holl, *Cinema, Trance and Cybernetics* , 28.

24
Hito Steyerl, "Bubble Vision," lecture, January 28, 2018, STAMPS School of Art and Design.

25
Quoted in Alla Gadassik, "Esfir' Shub on Women in the Editing Room: 'The Work of *Montazhnitsy* ' (1927)," in *Apparatus: Film, Media and Digital Cultures in Central and Eastern Europe* , no. 6 (2018).

26
Toukan, "Toward a More Navigable Field." Updating the frame is computed by frame-per-second (fps) as well as by the unit of "chunk" in video-gaming such as *Minecraft*. The higher the fps, the better the fluidity of the navigational image and the faster the action; the higher the rate of chunk the better the rendering of distance and more quickly exhaustible the memory space as well as energy.

27
Negarestani uses this phrase in the context of a discussion about his geophilosophical understanding of the regional-universal relation. See Reza Negarestani, "Globe of Revolution: An Afterthought on Geophilosophical Realism," *Identities* 8, no. 2 (Summer 2011): 25–54.

28
Thomas Elsässer, "Simulation and the Labour of Invisibility: Harun Farocki's Life Manuals," *animation: an interdisciplinary journal* 12, no. 3 (2017): 214–29. Elsässer's approach does not, however, problematize technological labor in regard to gender politics. For this, see the work of theorists and writers Sadie Plant and Wendy Hui Kyong Chun, who examine the proximity between invisible labor and female labor in computational technologies.

29
I am thinking of the video installations *Serious Games* (2009) and *Parallel 1–4* (2014) by Harun Farocki; the desktop documentary *Transformers: The Premake* (2014) by Kevin B. Lee; the video essay *Against the POV* (2016) by Clemens von Wedemeyer; the performance *In Rotation for Projection and Monitor #1* (2017) by Sondra Perry; the desktop video *Nucleus of the Great Union* (2018) by the Otolith Group; and the spatial audio performance *ANXIETIN* (2018) by Hannah Black, Bonaventure, and Ebba Fransén Waldhör, among others.

30
Ibid., 20.

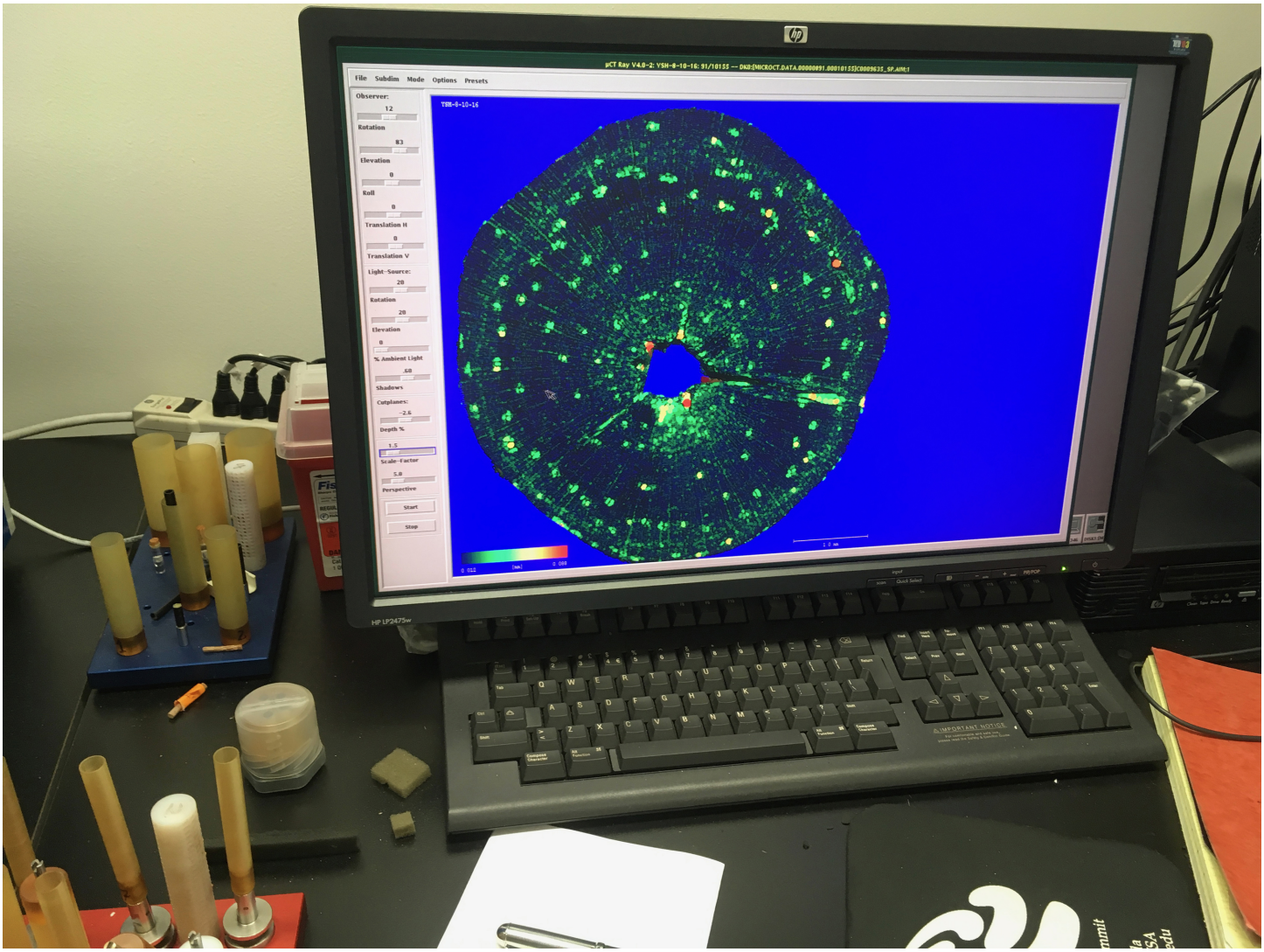
Brian Kuan Wood

Insurgency of Life

What is life in a world where I am also the architecture of that world? Until recently, the history of Western scientific development has been a history of a brutal spiritualism, where discoveries of cosmic mechanics only further displace the human observer. I might gain access to God's computer in a quest to commune with higher forces, only to progressively discover that material forces are programmed as an inhospitable abyss in which my life means nothing. Science might come to the rescue to draw these material forces back under human command, weaponizing and industrializing their power to limit their threat. From Descartes conceding that we possess an exceptional soul in spite of being animate machines and Darwin's allowing us an aristocratic status in spite of being animals, a brutal self-extinction has haunted (perhaps even guided) the European spiritual imaginary since the Enlightenment.[1] We might eventually consider that mechanical forces and animal survival might have better things to do than conspire to exterminate our human kingdom the moment we observe them. In the meantime, we still need to contend with a world or worlds that serve our every need in the absolute, even amplifying them into architecture, sealing us in and serving us at the same time.

If you find yourself feeling that life is just a game, perhaps that's because it became exactly that. It's not only a matter of racking up likes on a photo or checking your bank account to see how much life you have remaining in the game. On the one hand, your life and movement through the world depends on many things, and plenty of those things can be measured.[2] On the other hand, any world is by definition an enclosure, and there are ways of creating worlds made of measurable things and behaviors that seal off other forms of life and measurement, closing around a user or observer like a glove, surrounding me with echoes of my own choices and actions. The question of navigation concerns the form of life that arises in these "echo chambers" of user-centered design, which could be said to radicalize the position of the observer through exponential increases in computational power, creating what Tom Holert has called "a space that is constantly transforming and being transformed by numerous corporeal extremities moving, gesticulating, touching, caressing in a multiplicity of directions and with varying degrees of intensity."[3] We might move through worlds and sense their ambient coordinates at the same time as those worlds learn from our movements, perhaps even creating the coordinates that we sense. Such self-fulfilling prophesies are familiar to games and virtual worlds that can adapt codes and laws to events within a given framework, but they also seize upon properties of our organic life, exposing them as programmable worlds as well.

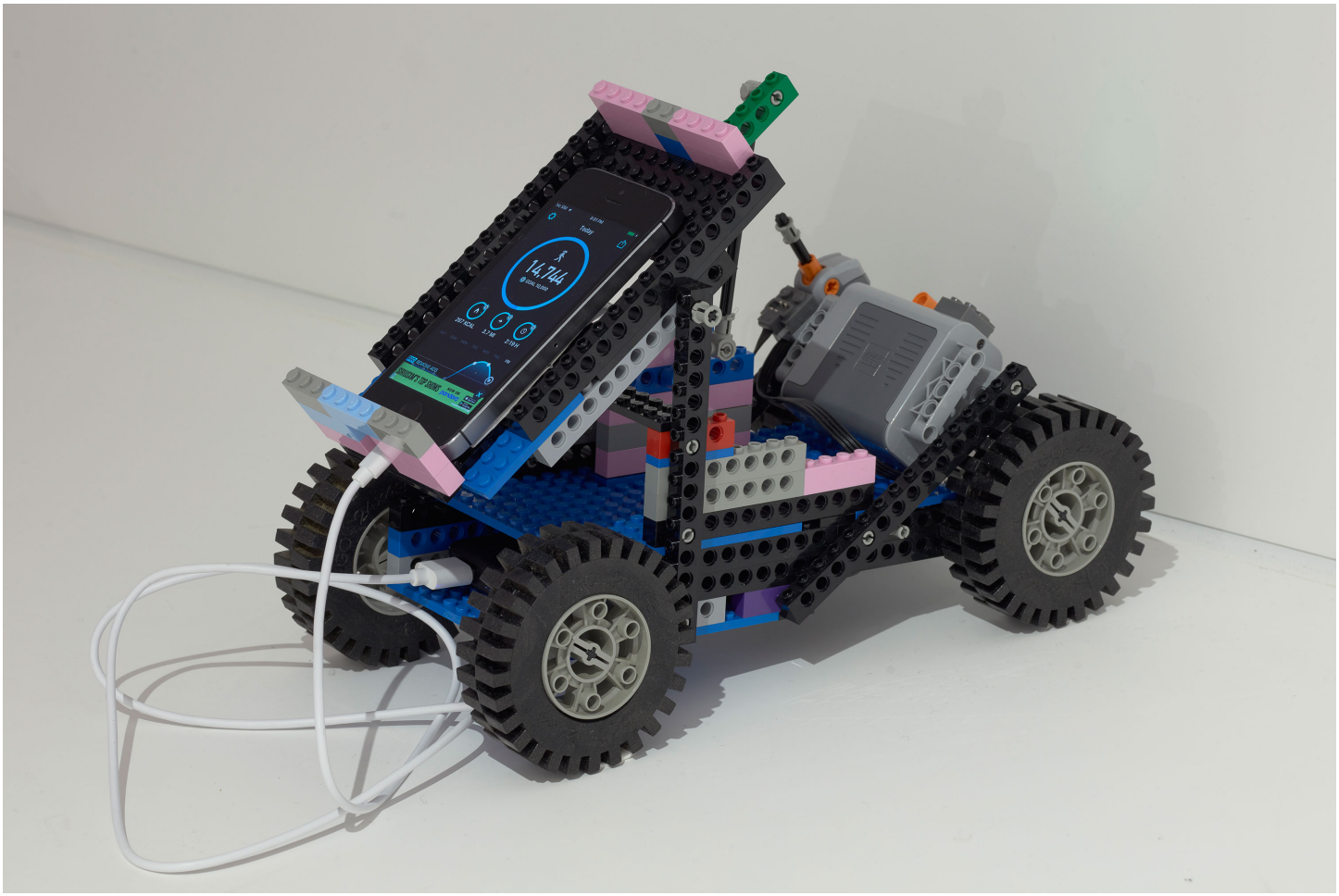
Writing this in the midst of the Covid-19 pandemic, it is remarkable to witness how a genetic mutation has prompted a global war against a truly internal threat, which is sometimes speculatively called a revolution for arresting production for a period of internal



Computed tomography scan showing the increased number of resin canals in a genetically modified pine tree, generated by the lab of Prof. Gary Peter, University of Florida, 2018. Photo: Goldin+Senneby.

self-questioning and self-examination. Wars between large powers or revolutionary convulsions of internal and external vulnerabilities tend to be simplified to serve historical narration as political power shifts or as social progress or regress. But they are all we have to measure the scale of the virus, which, coming from inside of organic life itself, seems to confound any political understanding that makes assumptions about bilateral conflicts between inside and outside, or about the terms of social progress.[4] Fortunately, we have Donna Haraway to remind us of the immune system as a preeminently twentieth-century "map drawn to guide recognition and misrecognition of self and other in the dialectics of Western biopolitics."[5] This is not only about staying inside on screens to combat the threat looming outside—as each of us knows, the threat may already be inside our own bodies. It is also about the twinning of technological progress and human self-extinction, whereby even the noble goal of harnessing machines to create energy, prosperity, and free movement for the largest number of people seems futile when the same machines attack humans through weapons of war, accelerating the spread of contagions, or prompt mutations, autoimmune diseases, and cancer. Derrida has written that the sacredness of human life opens a space beyond the living that is also a space of death, linked to technology and machines and dimensions of autoimmunity and self-sacrifice.[6] Earlier this month, I saw simultaneous news reports of mass graves being dug in New York City, while the reduction in air pollution has made the Himalayas visible from cities in northern India for the first time in thirty years.[7] Clearly, this crisis raises serious questions about what sort of productivity we are so eager to return to.[8]

Industrialists and managers are eager to restore the economic circulatory system, even when it risks exposing workers to the virus. Many workers urgently need the



Goldin+Senneby, Insurgency of Life at e-flux, New York, 2019. Installation view. Courtesy of the artists. Photo: Gustavo Murillo Fernández-Valdés.

income, and many people need the goods and services they produce and distribute—our lives derive from the health of the current economic system and are directly opposed to it at the same time. While the terms of this biopolitical enclosure (or simply: contradiction) have been clear since the early days of capitalist industrialization, it seems to demand something further today.[9] There is a real danger in the temptation to simply embrace our own death and extinction by industrial machines as a natural outcome of an overinvestment in their awesome power, and to stage a retreat into ecstatic pastoralism. We might look to how the disgraceful abandonment of Detroit and its people and industry has been marked by accelerated entropy, the decay of domestic and industrial buildings giving way to wild overgrowth, land reclamation projects, and urban gardening initiatives from the ruins of human industry. Some might have the luxury of seeing this as nature taking revenge on a pollution-producing car industry and the self-consuming runaway productive power of machines that obediently execute a human command and then repeat it until we regret having given that command in the first place. It is strange, however, that plants should have a monopoly over other forms of organic life, where the fortunes of humans are assumed to be the same as the fortunes of machines. Such apolitical pastoralism must assume that it is only natural for the owners of industry to behave like predatory animals, decimating human lifeworlds and then seeking opportunity elsewhere when a technical paradigm shifts or the local population has been depleted.

At their foundation, machines are based in extremely powerful observations of the natural world, and are—like ourselves—already products of an ecstatic communion with its functioning. Why must this communion always initiate an autoimmune response where we scramble in a fit of horror to restore command and control through science and pathological mass production? We might consider that there is something poor about this model, that it is clearly stuck in a specific cultural cosmology lacking in the means to live and make a home within the horror of its own limited imagination, much less the mechanisms and organisms of the material world. The recent work of the Chinese philosopher Yuk Hui is crucial in this regard, advocating a "cosmotechnical" view of technology as embedding cultural cosmologies into technical systems, which can only be cultural systems.[10] By detaching technology from the cosmological monopoly

of Enlightenment rationality and its apparent enhancement by the Industrial Revolution and Silicon Valley, Hui pushes the question of technology back from forms of brute automation to create a clearing which many diverse reflections of deterministic power can also inhabit. Many of these reflections have been invariably called "art" in the Western world, perhaps because it remains difficult to understand the relationship between productive or technical power and the ordering of physical forces beyond the reach of human craft.

For Hui, Western Idealism remains integral for having deeply registered the pressures of transcendental laws on organic life. In *Recursivity and Contingency*, Hui looks to cybernetics as having resolved the contradiction between mechanism and organism though its use of feedback, which, by "recursively turning back to itself to determine itself," absorbs contingencies omnipresent in nature as "a test that reason has to pass."[11] If Western philosophy is often criticized for relying on taxonomical dualisms of mind and body, spirit and matter, organism and mechanism, it is also saved by its own dialecticism, which creates mutuality and a motor of feedback between these synthetic poles of interiority and exteriority, creating actual complex ecologies rather than simply a vulgar killing of God and enchantment by the blunt object of rational law in the name of progress. The notion of return is crucial to establish common ground between two fundamentally divergent axes of time that Norbert Wiener identifies in the first chapter of his 1948 *Cybernetics: Or Control and Communication in the Animal and the Machine*: the Newtonian mechanistic and reversible time of planetary orbits, and the thermodynamic evolutionary time of organic life. Planets always return to their origin and repeat the same cyclical movement, so any end is also a beginning. Wiener uses film to illustrate: playing a film of planetary movement backwards or on loop would look essentially the same; however, playing a film of clouds moving backwards would appear unnatural, since clouds never return to an original position to initiate the same cycle again. As with organic life, death is not a return to the origin of birth.[12] Much has happened in the meantime: the body has decayed in time and will eventually expire. However, in its lifespan the body also grew, developed, and learned through unexpected encounters that form its experience and knowledge.[13] As Anna Tsing has written, "without the possibility of transformative encounters, mathematics can replace natural history and ethnography."[14]

For Hui, cybernetics effectively combined mechanistic and organic systems through the use of information as "a measure of the level of organization," with that organization being "the capacity to recursively integrate contingencies." Information has form-giving at its root, to give shape or form.[15] Just as cybernetics is neither machine nor organism, Wiener points out that information is neither matter nor energy. Hui continues: "Indeed, information, matter, and energy become the fundamental elements of a new theory of individuation." Information is what gives form and shape to this new world where machines are "no longer simply tools or instruments but rather gigantic organisms in which we live."[16] Ecology is thus not nature but this larger container that mediates and animates flows between matter and life, which is itself an organic machine. It begins to look something like a global economy—a totalizing lifeform that sustains the lives and livelihoods of humans, but also a circulatory system of calculable values and activities. In this sense, a global economic body also becomes a virtual space like gamespace—a navigable model *of* the world that also *is* the world, expressed in metrics. Even today, like gamers or stock traders, we stay at home in hopes of "flattening the curve," monitoring stats until a parametric value falls below a certain point, a threshold reflecting, say, the number of new Covid-19 cases hospitals can accommodate.

The totalizing nature of these gigantic cybernetic "organisms in which we live" scrambles any conception of boundary and boundedness, between inside and outside: we must all share the same world, but simultaneously try to commune with a divine outside, which often consists of tech giants controlling the laws of physics in worlds formed by information.[17] But if worlds are made (and perhaps unmade) according to monopolies over ontological resources, there must certainly be other outsides and other insides. Anthropologist Elizabeth Povinelli has suggested one-worldedness to be a late-liberal hangover from narratives of human progress, replacing a horizon to cross with a *surround*: a form of enclosure without a wall or gate: "One can go here or there in the surround but it really makes no difference because there are no meaningful distinctions left to orient oneself—to determine where one goes or what one believes or holds true."[18] However, for Povinelli, it is the traffic between worlds or spheres that allows other, new worlds to emerge.

Today, the trillionfold increase in processing power experienced over the second half of the twentieth century and into the twenty-first is slowing down, yet the ways of inhabiting this enormous power are still being explored. The powers to communicate, to organize the transportation of goods and people across distances, to register and synchronize changes in value as they enter and exit various zones have radically expanded the way that space and time are expressed and perceived. Yet these extensions are only possible through the medium of alphanumeric or mathematical calculations, which move through space and time with an ease that objects or human bodies cannot match. Haraway wrote in the early 1990s: "Our best machines are made of sunshine; they are all light and clean because they are nothing but signals, electromagnetic waves, a section of a spectrum, and these machines are eminently portable, mobile—a matter of immense human pain in Detroit and Singapore. People are nowhere so fluid, being both material and opaque."[19]

Goldin+Senneby, Crying Pine Tree, with Katie Kitamura (novelist) and Alexander Provan (editor and permittee of GE loblolly pines). Unboxing performance, Triple Canopy, New York, 2020. Photo: Meredith Morran.

While objects and human bodies are distressed or damaged by the pressures of movement, we could say that numbers always arrive at their destination just as they were at their origin. Could we say that worlds—if indeed they are gigantic organisms, cybernetic or otherwise—are also subject to similar stresses?

Weather has always marked a certain horizon for computing. As an absolute outside whose inherent volatility can never be fully mastered, insurance companies will always include a provision for "acts of God," which are usually weather events. Nevertheless, weather prediction was one of the first major challenges given to early supercomputers to test their ability to identify meaningful patterns in extremely complex thermodynamic changes. Today, computers model many other affective and thermodynamic changes, notably financial markets. But in financial markets, feedback works very differently, because human traders are able to read patterns of their own activity. Clouds and weather events, however, do not monitor their own forecasts and have feelings about which direction they are trending in, feelings that could affect or change their direction. Feedback creates this possibility for exponential amplification, whose echo chambers and forms of volatility characterize life inside a large cybernetic organism. On the other hand, it is no secret that much of today's climate volatility results from human industry, and in this sense we may identify mechanisms of feedback that cause natural forces to behave similarly to a computational model, where the architect or author of the model is inscribed *in* the world as well as *by* the world it created. This is what makes the Anthropocene an absolutely technological apparatus.

The Swedish co-artist Goldin+Senneby have recently begun to explore what happens when the human body becomes the site where worlds and their monopolistic interests overlap and come into conflict with one another. Much of their previous work was concerned with processes of extreme financialization and offshore finance as a hegemonic form of withdrawal: "a secretive space that a third of the world's GDP and half of the global money supply passes through" and "a different kind of virtual space to try to inhabit."[20] From conversations with the artist(s), I suspect that their implicit critique of financial abstraction was mixed with an erotics of abstract or virtual space, where disappearing inward promises a kind of negative freedom from the world of physics and all its demands and desires. In the midst of new technologies of accumulation, one might say that their paradoxical artistic proposal was actually to probe how abstract space could be also a habitable one, at least as a screen on which to project desires of movement that may also be desires for solitude and reflection.

Recently their work has turned to a more visceral process of embodiment and disembodiment experienced by Jakob Senneby, one half of the collective, who has for the last decade suffered increasingly with multiple sclerosis, an autoimmune disorder in which the body recognizes elements of itself as foreign and sets out attacking them. Here the terms of abstraction are reorganized to center on a body in a critical state, retroactively animating Goldin+Senneby's interest in virtual space but with the more visceral (and carceral) urgency of biological limits. Their earlier hope of "becoming virtual" has, on one hand, failed, since the corporeal body reestablished itself as the ultimate limit to any imagination of free movement, while on the other hand, the need to engineer a habitable environment (as a body) has become more urgent than ever.

Goldin+Senneby have said in describing their turn away from financialization that today "power seems to manifest in ever more grotesque and authoritarian guises," and indeed one might argue that the question of self-identity is a symptom of a vast autoimmune crisis in political consciousness itself.[21] Postcolonial thought has always been quite clear on the fact that nations whose wealth are based in extraction and plunder are clearly not qualified for the lofty patrician human rights discourses they promote, as if to launder their own ill-gotten gains. Today, however, they too have been forced to shift from an encompassing patrician discourse to a more detailed identitarian questioning of who qualifies for the care of the state and who does not, which is not only an opening to an apparently legitimate racism (that many will argue was there all along) but also to a more profound crisis of self-identity, an ambient political "who am I?" of many national autoimmune conditions.[22] Here Jakob Senneby's statement seems prescient: "In the internal world, my overactive immune system (multiple sclerosis) has reached a point where it can no longer be ignored. I am becoming less able, but also less interested in inhabiting the ableist fiction of high-performance bodies. My biological experiences have shifted our imaginaries, and require a new kind of fiction to inhabit."

What might this "new kind of fiction" be? In their exhibition last year at e-flux, "Insurgency of Life" (named after an earlier version of this essay[23]), Goldin+Senneby explored the "becoming virtual" of the body in relation to predatory forms of life and data harvesting, all informed by attempts to counter the disabling effects of Senneby's autoimmune disorder. Maria Lind, the curator of the exhibition, has detailed how the exhibition centered on the *Isaria sinclairii* fungus used in a medication called Gilenya, which Senneby used to take for multiple sclerosis.[24] The artists also found that the *Isaria sinclairii* fungus proliferates in a horrific drama when growing in the wild, seeking out and exclusively growing on cicada nymphs when they are hatching below ground: "After colonizing the cicada, the fungus eventually grows and sprouts from its head." As a counterpoint to the fungus growing in the exhibition space, the show also featured ten small robots built out of Legos using YouTube tutorials, each mechanically rocking a smartphone with an app tracking bodily movement for healthcare insurance companies offering discounts for reaching certain fitness benchmarks. The little robots all had wheels but traveled nowhere, as vestigial leftovers from the original Lego model of a vehicle, before they were repurposed to rack up discount points in a zombie rehearsal of data-driven ableism. These new pharmaceutical or pharmacological fictions are generated by an industrial status quo that harvests insurgent life and colonizes our life at the same time.

As fictions go, the above examples are realist dramas played out in the worlds of organic life and computational measurement, but is it possible to understand them in relation to the more erotic and projective desire to become virtual that Goldin+Senneby seemed to suggest in their earlier work, where disembodiment could be understood as a form of free mobility similar to flight? The question might be similar to asking whether there is any place at all for questions of freedom and escape in relation to the folding inward of biological and computational life. Can we still identify a desirable fiction for relations of production when both relations and production form an architecture of world enclosure? We might turn to artificial scarcity as engines of meaningful community, since at least they restore boundaries and intimacies. Perhaps in quarantine I am, with my family, recreating the conditions of a remote tribe with limited contact, developing our own cuisine and rituals in a blossoming of a thousand kinds of *Innere Emigration* that some may still recall German dissident intellectuals practicing during the Third Reich. But this turn inward already follows the script of autoimmunity—it is a necessary mutation that derives from catastrophic togetherness. Perhaps this is what Paul B. Preciado meant when he closed a recent article with the imperative: "We must go from a forced mutation to a chosen mutation."[25]

If worlds are indeed elaborate fictions, we might also understand them as metafictions that maintain a permeable fourth wall between stage and audience, placing the viewer or reader in a reflexive or even contradictory relationship with the storyline and its mechanics. Often new political narratives—in revolutions, for instance—must also reveal the constructed nature of existing narratives, breaking the authority of what was actually a dramaturgical and performative enclosure. There may be a painful reckoning when political imagination is limited to pragmatic options already determined by the regimes it seeks to overturn, but that is also where world-building shows its immense power. In researching autoimmunity, Goldin+Senneby encountered the work of Ed Cohen, a professor in the department of Women's, Gender, and Sexuality Studies at Rutgers University whose own experiences with an autoimmune disorder led him to examine autoimmunity as a living

contradiction whose consequences can nevertheless be lethally real. Cohen writes that, "In theory autoimmunity shouldn't exist, since self should not 'discriminate' from (or against) itself as non-self while remaining itself … immunologically speaking what makes a 'self' itself is its self-tolerance." [26] In the same article, he traces how the logical and *bio*-logical impropriety of the term "immunity" became bio-political when, at the 1866 International Sanitary Conference in Constantinople, it was borrowed from a formation of medical, diplomatic, and economic imperatives to limit the spread of the cholera pandemic. The Latin *immunis* had, since the Roman Empire, been primarily a legal and political term for exemption from duties and services, but in the context of the conference came to be used for certain locales deemed more hygienic, and therefore exempt from economically restrictive quarantine measures: "If a nation was deemed 'relative[ly] immune' (in a biological sense) from cholera, then it could remain entirely immune (in a legal sense) from quarantine." [27] Following the conference, Robert Koch, a German medical and military officer, began to visualize pathogenic bacteria (especially cholera, anthrax, and TB) "through the cultural lens of 'invasion' that had crystalized around cholera … Indeed, when he looked at the 'comma bacilli' that he famously defined as cholera's 'cause', he saw them as the actual vectors that enabled cholera to 'invade' Europe; therefore, *by metonymy he characterized infectious pathogenesis itself as a form of bacterial invasion*." [28] A Russian zoologist, Elie Metchnikoff, countered that: "if bacteria 'invade' larger organisms this cannot be a one-sided battle, or else we'd all just be collateral damage. Instead, he conceptualized infectious disease as an inter-species struggle in which an infected organism mounts its own 'defensive' response and then, mobilizing the juridico-political term that the International Sanitary Conference settled on, he named this defensive capacity immunity.[29]

Against the backdrop of such a metafiction of immunity, we might look towards mutation as "a new kind of fiction to inhabit," particularly one that reopens the possibility of change to engineering. But the question remains: Is it even possible today to approach mutation in a way that does not simply extend immunological metonyms for foreign invasion or defense, or worse, ableist fictions of control? In a parallel project Goldin+Senneby have been working on called *Crying Pine Tree*, the artist(s) have become interested in what they call "performative writing practices within biology" and how the field of synthetic biology fundamentally challenges our understanding of life itself. In their own words: "The performativity of synthetic biology can be found in its shifting the entire field of biology from an analytical one—reading and classifying forms of life—to one where genetic inscription produces new lifeforms."[30] On the discipline that took form at MIT around the turn of the millennium, they offer the example of Drew Endy, a pioneer of synthetic biology who struggled to make a computer simulation of the mutating T7 virus and consistently failed. Eventually, he reached a breakthrough when, instead of making a model that would predict the virus, he successfully made a virus that followed his model. Goldin+Senneby gleefully conclude: "He could not adequately represent biological 'reality,' but he could create a new reality that mirrored his failed representation!"

Harun Farocki (with Matthias Rajmann), Parallel II, 2014. HD video, 16:9, color, sound, 8:38 min (loop). Courtesy of Harun Farocki GbR, Berlin.

Against this comedy of worldmaking, the artist(s) note how the culture of genetic engineering is deeply invested in the notion that all forms of life are programmable, and therefore open to reprogramming and rewriting, which on its own could have enormous artistic potential. However, the terms of this programmability may have already been decided, and they seemingly "go hand in hand with a desire to optimize—to genetically enhance longevity, immunity, efficiency"—essentially repeating all the supremacist pathologies we know too well from the West's brutal history of monsters of reason. *Crying Pine Tree* is thus a tree programmed to have its sap production (which is known to be a source of biofuel) "upregulated" to the point of drowning the tree itself in a circular and runaway productive ableism. The question remains open: What is a programmable lifeworld without these male fantasies of infinite potency and growth that are only doomed to narcissistic self-annihilation?[31]

Remember how we used to know some kind of technical intervention was underway? A rupture, interruption, glitch, or discontinuity would break the fourth wall. Eventually, we would get used to static, hiss, cracks and pops, knowing that technology always aims for continuity but falls short in its performance. We might even reclaim some distance in celebrating these failures as inscriptions of its hubris, just as many artists find rich material in the widening of these cuts and interruptions, recognizing their auto-insurrectionary capacity and even humanity in their error. Worlds, on the other hand, are by definition continuous and self-contained—they must sustain a logic of continuity to exist at all. This is what makes Harun Farocki's *Parallel* series particularly virtuosic for forcing

computer game worlds to perform in Brechtian mode, opening up a kind of dimensional comedy. In fact, this is what makes a huge amount of his work virtuosic, since so many of his works actually deal with attempts to engineer seamless behavioral or mediatic continuities in social life and political consciousness, but his touch seemingly reduces their totalitarian ambitions to joyfully failed fictions.

But attempts at totalitarian world-building continue. Today we might paradoxically perceive the traces of world-building technology in seamlessness and consolidation, which can be radicalized as healing—the elimination of cuts and ruptures and rifts in space and time that were there previously. You might know you are in one of these worlds when tensions magically disappear. You forgot about the genocide. That ancestral homeland your grandparents were expelled from might be magically welcoming you back. Just when you had gotten used to being on the shit side of history, you became a winner. You never wanted to be Superman, but you might accept a less bounded version of yourself. What happened? Why are friends and family members contacting you from beyond the grave? Do you feel an uncanny sense of wholeness setting in? Do you suspect that your biography is writing you, rather than the other way around? This healing can be a wonderful thing, but confronting it as an engineered mutation in a much larger world enclosure remains a challenge for the future.

X

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1
Though Marx was an admirer of Darwin, he wrote: "It is remarkable how Darwin recognizes among beasts and plants his English society with its division of labour, competition, opening up of new markets, 'inventions' and the Malthusian struggle for existence." Marx to Engels, June 18, 1862, in *Selected Correspondence* , ed. S.W. Ryazanskaya, trans. I. Lasker (Moscow: Progess, 1965), 128. Quoted in David Harvey, *A Compa nion to Marx's* Capital (London: Verso, 2010), 191.

2
Unless you are God, who doesn't depend on anything or anyone.

3
Tom Holert, "Ships in Doubt and the Totality of Possible Events," *e-flux journal* , no. 101 (June 2019) https://www.e-flux.com/journal/101/272862/ships-in-doubt-and-the-totality-of-possible-events/ .

4
And not just any threat, but a virus—a nonhuman force that overwhelms all of humanity like films in the 1990s when, apparently struggling for planetary-scale adversaries following the Cold War and Fukuyama's declaration at having arrived at a universally satisfied state of being, Hollywood looked to weather events, ecological aberrations, alien invasions, and that sort of wild or sublime outside for ambient horror. I remember that many of these films carried a sense of desperation in the way they conjured apocalyptic threats that seemed to come mainly from having too much time on one's hands, not unlike the way people sealed off in the virtual worlds and *Truman Show* bubbles of wealthy neighborhoods are haunted by visions of rapists, burglars, or minorities appearing as if from their own guilty conscience to ruin a way of life they suspect conceals a hidden violence already. Today, just such an ambient violence has merged with human bodies and human lifeworlds to assert its own universalism in the negative.

5
Donna Haraway, "The Biopolitics of Postmodern Bodies: Constitutions of Self in Immune System Discourse," in *Simians, Cyborgs, and Women: The Reinv ention of Nature* (Routledge, 1991), 204.

6
Jacques Derrida, "Faith and Knowledge," in *Acts of Religion*, ed. Gil Anidjar (Routledge, 2002), 87: "The price of human life, which is to say, of anthropo-theological life, the price of what ought to remain safe (*heilig*, sacred, safe and sound, unscathed, immune), as the absolute price, the price of what ought to inspire respect, modesty, reticence, this price is priceless. It corresponds to what Kant calls the dignity (*Würdigkeit*) of the end in itself, of the rational finite being, of absolute value beyond all comparative market price (*Marktpreis*). This dignity of life can only subsist beyond the present living being. Whence, transcendence, fetishism and spectrality; whence, the religiosity of religion. This excess above and beyond the living, whose life only has absolute value by being worth more than life, more than itself—this, in short, is what opens the space of death that is linked to the automaton (exemplarily "phallic"), to technics, the machine, the prosthesis: in a word, to the dimensions of auto-immune and self-sacrificial sup-plementarity, to this death-drive that is silently at work in every community, every auto-eo-immunity, constituting it as such in its iterability, its heritage, its spectral tra-dition."

7
Hart Island in the Bronx is a little north of North Brother Island, where Typhoid Mary was quarantined: https://www.democracynow.org/2020/4/10/headlines/new_york_city_workers_dig_mass_graves_amid_surge_of_covid_19_deaths . See also: https://www.democracynow.org/2020/4/9/headlines/air_pollution_plummets_worldwide_amid_coronavirus_lockdowns . Of course, Delhi's nice views aren't necessarily changing the fact that graves are being dug there too: https://www.buzzfeednews.com/article/nishitajha/coronavirus-india-covid-19-burials .

8
Bruno Latour even compiled a questionnaire: http://www.bruno-latour.fr/sites/default/files/downloads/P-202-AOC-ENGLISH.pdf .

9
"The new industries only became important with the change from the tool to machine and from workshop to factory. This involved the transformation of the working middle classes into a toiling proletariat and at the same time transformed the wholesaler into the factory owner. This process involved the disappearance of the lower middle class and the emergence of a society in which workers and capitalists were sharply differentiated. But this process of social change was not confined to industry in the narrow sense of the term. It occurred also in craft work and even in commerce. Former masters and apprentices were replaced by large capitalists and workers. … Craftsmanship was now replaced by factory production. … The result was that the small master could no longer compete with the big factories and so sank to the position of a mere worker." Friedrich Engels, *The Condition of the Working Class in England* , trans. W.O. Henderson and W.H. Chaloner (Stanford: Stanford University Press, 1968), 24.

10
See, for example, Yuk Hui, "On Cosmotechnics: For a Renewed Relation between Technology and Nature in the Anthropocene," *Techné: Research in Philosophy and Technology* 21, no. 2–3 (2017): 1–23.

11
Yuk Hui, "Introduction: A Psychedelic Becoming," in *Recursivity and Contingency* (Rowman & Littlefield International, 2019), §2, "Invisible Nature, Visible Mind."

12
Unless you are a Buddhist or Benjamin Button, of course.

13
Hui, *Recursivity and Contingency*: "Life also exhibits such complexity, since it expects the unexpected, and in every encounter it attempts to turn the unexpected into an event that can contribute to its singularity."

14
Anna Lowenhaupt Tsing, *The Mu shroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton University Press, 2015), 28.

15
Middle English *enforme*, *informe*, "give form or shape to," also "form the mind of, teach," from Old French *enfourmer*, from Latin *informare* , "shape, fashion, describe," from in- "into" + forma "a form."

16
Hui, *Recursivity and Contingency*.

17
Vladan Joler and Matteo Pasquinelli recently published their *Nooscope* modeling the limits of artificial intelligence ("how it works and how it fails" through "the broad spectrum of errors, limitations, approximations, biases, faults, fallacies and vulnerabilities that are native" not to "a monolithic paradigm of rationality but a spurious architecture made of adapting techniques and tricks"), https://nooscope.ai/

18
Elizabeth A. Povinelli, "After the Last Man: Images and Ethics of Becoming Otherwise," *e-flux journal* , no. 35 (May 2012) https://www.e-flux.com/journal/35/68380/after-the-last-man-images-and-ethics-of-becoming-otherwise/ : "But if the dominant image of this theory of desire and democracy begins as a horizon, it ends as something very different. If liberal democracy is the *horizon* of desire already inscribed in the fight for recognition (the orientation and end of human becoming, and thus the end of history itself), then when liberal democracy has been universally achieved, human historical becoming collapses into a satisfied human state of being. The horizon then becomes what I will call a *surround*, a form of enclosure without a wall or gate. The surround is without an opening. It is an infinity of homogeneous space and time. It is an 'everywhere at the same time' and a 'nowhere else.' One can go here or there in the surround but it really makes no difference because there are no meaningful distinctions left to orient oneself—to determine where one goes or what one believes or holds true."

19
Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs* , *and Women*, 149–81.

20
From a talk by Goldin+Senneby at School of Visual Arts' MA Curatorial Practice November 2018 https://www.macp.sva.edu/crying-pine . All following quotations by them are from the same lecture. See also the wonderful 2017 documentary *The Spider's Web: Britain's Second Empire* on Britain's transition from a territorial empire to a financial one (where financial

presence replaced bodily presence) as a broker for money laundering. Key in this is the special status of the City of London, designed from its inception as an exceptional and extra-political accounting shell game: https://www.youtube.com/watch?v=np_ylvc8Zj8 .

21
See Yuk Hui's essay "One Hundred Years of Crisis," *e-flux journal* , no. 108 (April 2020) https://www.e-flux.com/journal/108/326411/one-hundred-years-of-crisis/ .

22
Jacques Derrida, "The Pharmakon," in *Dissemination*, trans. Barbara Johnson (University of Chicago Press, 1981), 101–2: "The immortality and perfection of a living being would consist in its having no relation at all with any outside. That is the case with God (cf. Republic II, 38 lb-c). God has no allergies. Health and virtue (*hugieia kai aretē*), which are often associated in speaking of the body and, analogously, of the soul (cf. Gorgias, 479b), always proceed from within. The pharmakon is that which, always springing up from without, acting like the outside itself, will never have any definable virtue of its own. But how can this supplementary parasite be excluded by maintaining the boundary, or, let us say, the triangle?"

23
Which has been completely rewritten from zero, so we might say that this essay is named after their exhibition!

24
Maria Lind, "What Is Wrong with My Nose: From Gogol and Freud to Goldin+Senneby (via Haraway)," *e-flux journal*, no. 108 (April 2020) https://www.e-flux.com/journal/108/325823/what-is-wrong-with-my-nose-from-gogol-and-freud-to-goldin-senneby-via-haraway/ .

25
Paul B. Preciado, "Learning from the Virus," *Artforum* (May–June 2020) https://www.artforum.com/print/202005/paul-b-preciado-82823 . "We must go from a forced mutation to a chosen mutation. We must operate a critical reappropriation of biopolitical techniques and their pharmacopornographic devices. First, it is imperative to modify the relationship between our bodies and biovigilant machines of biocontrol: They are not only communication devices. We must learn collectively to alter them. We must also learn to de-alienate ourselves. Governments are calling for confinement and telecommuting. We know they are calling for de-collectivization and telecontrol. Let us use the time and strength of confinement to study the tradition of struggle and resistance among racial and sexual minority cultures that have helped us survive until now. Let us turn off our cell phones, let us disconnect from the internet. Let us stage a big blackout against the satellites observing us, and let us consider the coming revolution together."

26
Ed Cohen, "Self, Not-Self, Not Not-Self But Not Self, or The Knotty Paradoxes of 'Autoimmunity': A Genealogical Rumination," *Parallax* 23 no. 1, p. 29. https://womens-studies.rutgers.edu/images/Fac_Articles/Ed-Cohen-_-Self-Not-Self-Not-Not-Self-But-Not-Self-or-The-Knotty-Paradoxes-of-Autoimmunity-A-Genealogical-Rumination.pdf

27
Ibid., p. 32.

28
Ibid., p. 32 (Emphasis in original).

29
Ibid., p. 32.

30
See also Sophia Roosth, *Synthetic: How Life Got Made* (Chicago: University of Chicago Press, 2017)

31
Consider the seemingly endless stories of patriarchs who dutifully protect their families while also creating a combustible model trainset world made of their own fears and lies, from *Breaking Bad* to the *Godfather* trilogy to *The Sopranos* , to name just a few. I remember years ago reading Slavoj Zižek describing Roberto Benigni's *Life Is Beautiful* as a "reverse of the decline of paternal authority," which seems to suggest that celebrating the patriarch as an empty sign leads to a far worse kind of strongman. "Why Is the Truth Monstrous?" in *The Fragile Absolute* (London: Verso, 2000), 75.

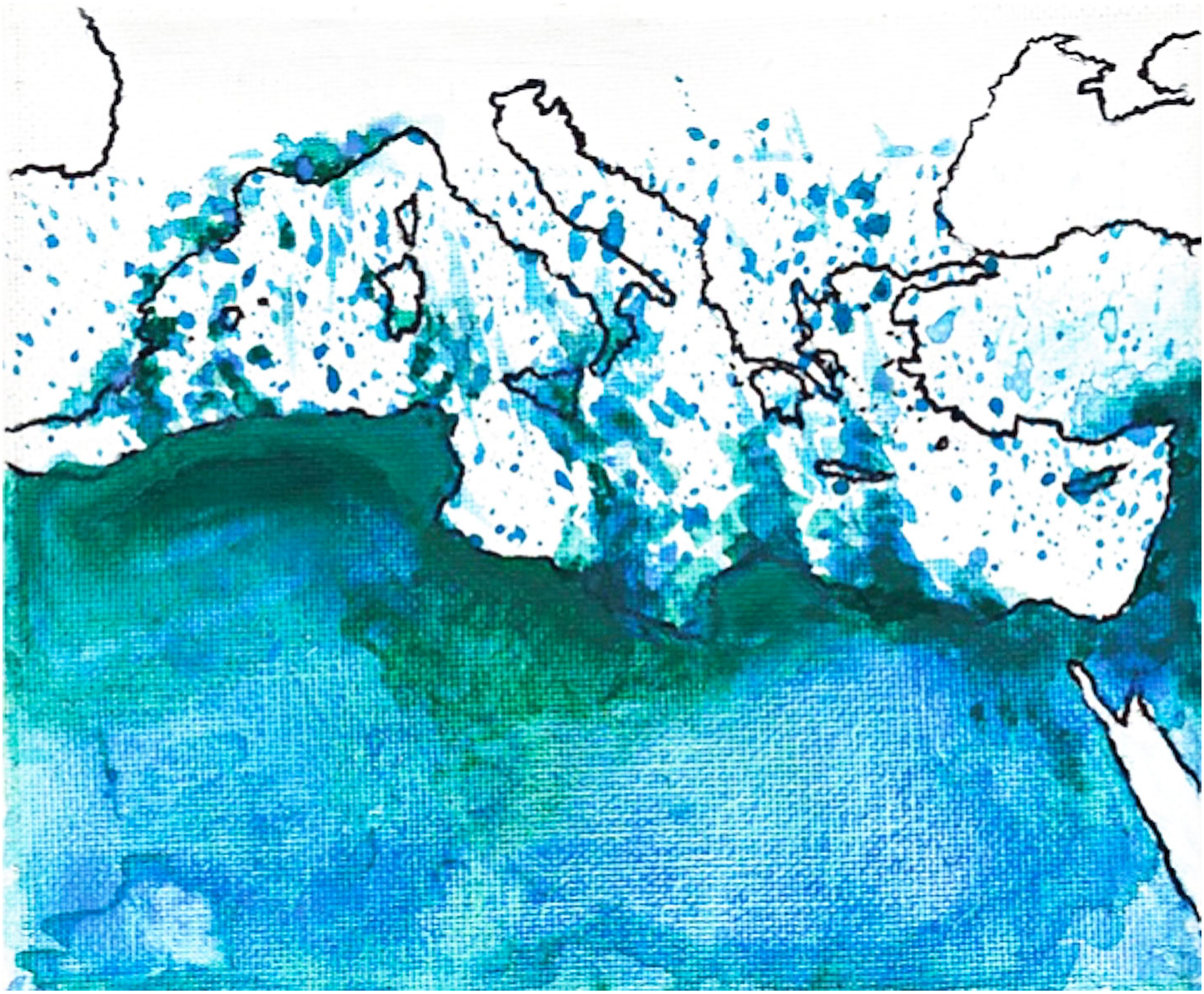
Laura Lo Presti

Like a Map Over Troubled Water: (Un)mapping the Mediterranean Sea's Terraqueous Necropolitics

Throughout history, the seascape, both as a metaphor and as a material and cultural formation, has been poetically and philosophically imagined through characteristics such as fluidity, vibrancy, and movement. For a recent example, geographers Philip Steinberg and Kimberly Peters have engaged in foregrounding the concept "wet ontology," which considers the sea as a spatial formation, imagining the world from the perspective of the sea, and not just the land. They claim that the sea "would seem to provide an ideal spatial foundation for [the] theorization [of society] since it is indisputably voluminous, stubbornly material, and unmistakably undergoing continual reformation."[1] The Mediterranean Sea, which historian Fernand Braudel called the "liquid continent," has been decanted in similarly aesthetic terms and occupies a central position in this discourse.[2] It has long been considered *the* spatial imagery of "another world,"[3] and "a key locus in the production of alternative modernities."[4] Given that the Mediterranean Sea connects (or separates, depending on how one looks at it) Europe from the rest of the world, it has long been at the center of oceanic philosophy, and occupies a centralizing, almost occluding, place in the thought of the seas. In this sense, its ongoing reformation, currents, and flows are often perceived by critical thinkers as crucial for unsettling the solid politics of the land.

However, given the ongoing "European" migration crisis, thinking about the sea today is weightily painful and can have harmful ramifications for migrants and others stuck in the political zones demarcated by ocean borders. From 2014 to 2020, migrant deaths at sea constituted 70 percent of global migrant deaths, and the Mediterranean Sea has become the deadliest passage ever with more than nineteen thousand estimated deaths since 2014, per the International Organization for Migration.[5] When the Mediterranean is mentioned in public discourse, it is, in fact, less often characterized as a contact zone generating conditions for vitality, cultural encounters, hybridizations, liquidity, or motion, as oceanic philosophy would have it, but rather feels like a *motionless deathscape*: a static and viscous cartography of wet flesh. In other words, the "livingness" of the sea identified above has turned into a terraqueous "deathworld."[6] This conceptualization, with the latter term borrowed from Achille Mbembe, suggests, in this context, that when the politics of the land flirt with those of the water, legislated borders corrupt the sea in such a manner as to alter its spatiality with violent rules.

This legislated stratification, criminalization, and punishment of movement across the Mediterranean has indeed produced what I would instead term an "immobilization" that is vastly manifest along migratory routes. By "immobilization," I refer to the several processes of physical, political, mediatic, and aspirational stillness and interruption that migrants are forced to confront when they attempt to move across countries, continents, and seas. Through this politics of visceral and symbolic immobility, the Mediterranean Sea has been consequently transformed into an interrupted space



Wiktor Dyndo, Wave, 2015. Courtesy of the artist.

where both historical movement and ideas of fluidity ascribed to the ocean have been substantially repressed.

On the one hand, such circumstances would make it urgent to allow for new liquid and fluid visions that oppose the solid, the latter constituted in the operations of making material and virtual borders orchestrated by ruling powers. On the other hand, however, I contend that aesthetic representations of a borderless sea and subsequent liquid metaphors for human flows may naively overlook the obduracy and the material confinements characterizing the present moment. Furthermore, such poetic visions also likely fail to attentively question—and perhaps alternatively rethink—the more amphibious images and practices that shape the present landscape of the migration crisis. The imagery of migration, particularly of boat migration, has indeed been rapidly striated, gridded, and mapped in recent years, depending on the tools and frames that define and redefine the coordinates of (im)mobility within contemporary visual culture, either in digital mapping tools, public memorials and art, or statist "rescue" apparatuses.

This means that the landscape of migration control has recently morphed into a terraqueous and semi-cartographic platform—consisting of an inextricable and violent entanglement between land and water—on which people materially and symbolically move or stand still, live and die, are visibilized or silenced as bodies or points, stories or numbers, moving subjectivities or geometric lines. When migrants travel across land and sea, they indeed experience many forms of hierarchized immobility such as lengthy confinement in prisons and detention centers, as well as torture. These obstacles

transform both movement and its representation into a much more intermittent and spastic experience than the frictionless one often depicted as viral flows on many migratory maps that appear in the news. Below, I underline images and maps that seek to either make this immobility visible (memorializations of the migrant crisis) or aid in movement (Google Maps used by those attempting the perilous journey). For migrants, maps often become life-saving navigational tools, fostering hope and imagination for an anticipated arrival, while also narrativizing their immobility. Mapping tools can be used differently by sea activists and border institutions to raise or slow down migration's visibility. For audiences in the Global North, evocative maps of the Mediterranean Sea's necropolitics can sustain collective forms of mourning and activism and can constitute individual and contemplative experiences of death on one hand, while also sensationalizing images that produce a desensitized public on the other.

Given the examples below, there is reason to understand why and how these "cartographic" imaginings and spatialization have come to rapidly infiltrate the necropolitical domain of the European migration crisis. In truth, cartographies concerning the precarious lives of people traversing land and sea are increasingly disseminated through digital media, news platforms, European and national political institutions' press releases, and NGO projects. Additionally, they frequently appear in public visual campaigns, narratives, movies, and artworks. The ubiquity of mapped representations of migration reveals a still overlooked and crucial relationship between cartography and contemporary visual culture: a relationship in which the map emerges alternatively as an ambivalent navigational tool, and a meaningful evocative image in need of scholarly attention. *Like a map over troubled water*, this article explores the difficulties and opportunities as well as the navigational frictions or evocative agencies that amphibious cartography expresses in the contexts of forced migration.

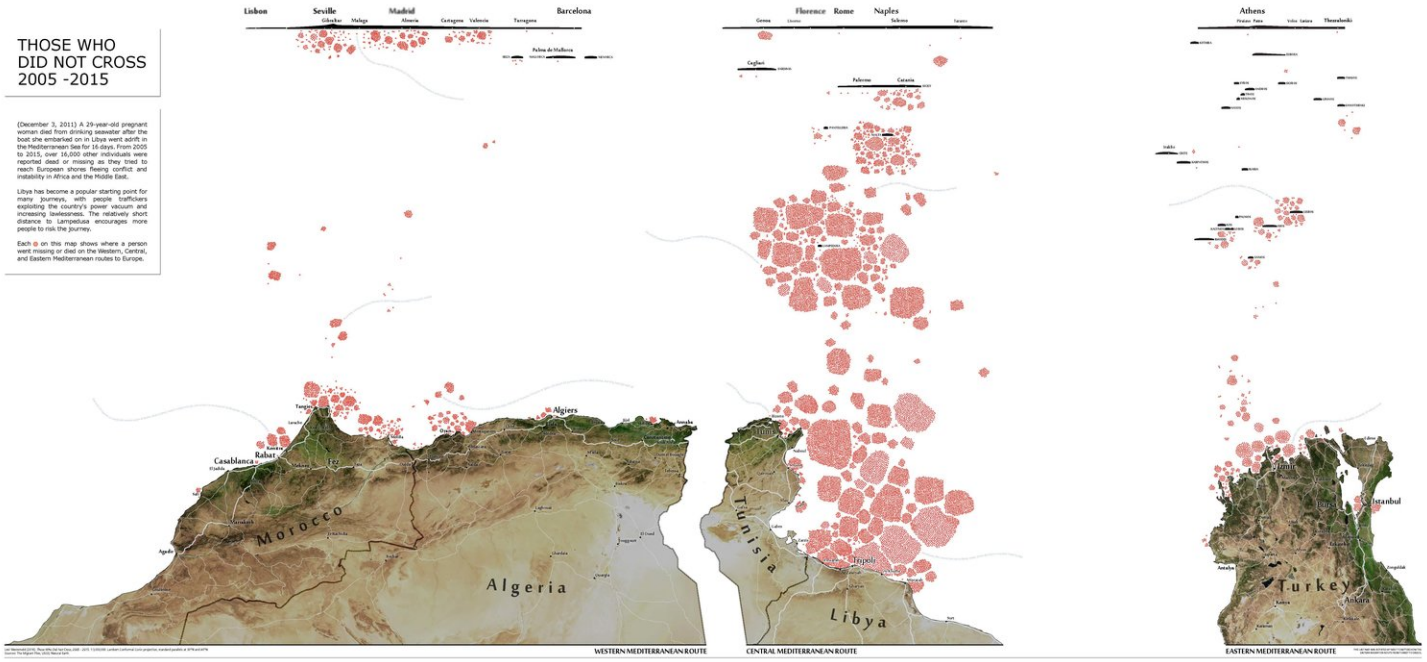
From Images to Maps

On June 7, 2014, the photographer Massimo Sestini gained international recognition due to a spectacular photo—shot from an Italian navy helicopter—of a crowded boat adrift in the Mediterranean Sea, twenty miles from the Libyan coast. The photograph depicts, from above, hundreds of people looking upwards, who smile and greet their "rescuers."[7] That year, the Italian navy was indeed involved in Operation Mare Nostrum (Our Sea), primarily devoted to search and rescue (SAR) activities, later superseded by Frontex's infamous Operation Triton. At the time, this specific sea crossing was narrativized by European countries as a singular emergency, and Western audiences could have never imagined that such events would soon become the norm. However, a few years later, we are now accustomed to and anaesthetized by the storm of images depicting shipwrecks and other disturbing scenes. Frequently, such images depict the never-ending journeys of people who walk across borders and continents or wait in refugee camps, as well as the border walls, blockages, prisons, and even exhausted and dead bodies that are part of the landscape of forced migration. This mediatic representation of the so-called "refugee crisis" or "migration crisis" reached its peak between 2014 and 2017—in terms of the high numbers of people arriving in the European Union, and the death toll at that moment—and those images have in fact come to pervade the collective imagery of the Global North. Referring to the protracted violence in the Mediterranean as a "crisis" is part of the problem, as movement and migration has been intrinsic to the cultures along the Mediterranean for millennia. The term, of course, also carries ideological connotations that we will explore later; in short, if human movement wasn't a "crisis," we wouldn't need borders at all.

This visual immobility has become so widely acknowledged that what is ordinarily defined, imagined, and discussed as "migration" cannot be disentangled from the wider cultural imagery that precedes, moves, and reproduces the familiar sense that the audience has of it. As W. J. T. Mitchell writes in *Seeing Through Race*, "Images 'go before' the immigrant in the sense that, before the immigrant arrives, his or her image comes first, in the form of stereotypes, search templates, tables of classification, and patterns of recognition."[8] This notwithstanding, we must not tire of questioning the mediatic role of images because of the perduring performative function they enable.

Through a simple, mechanical gesture—a search for the term "European migration crisis" on Google Images, or on the websites of the many stock image suppliers such as Getty Images and Alamy—the anticipatory iconography alluded to by Mitchell can be easily reconstructed and visually navigated. But in navigating the thousands of pictures that assemble and perform the visual archive of migration, one might be surprised by the number of images of maps, charts, and portrayals of people interacting with maps that proliferate in relation to tags like "border" and "migration issues."

Examining these mapped images, I have often been struck by the complex visuality of migration. Such pictures often portray maps as vibrant objects in various outdoor settings. In particular, I was struck by a series of large maps of Europe and the Mediterranean Sea variously "staged" in urban European settings, as well as in the refugee camps of Moria and Idomeni, in Greece. To capture the affective moods concerning the politics of forced movement, many photographers draw attention to the map as the backdrop of migrant life, or as an object that evokes emotions—the fetishized remnant of a journey, or a memorialization for a place of death.

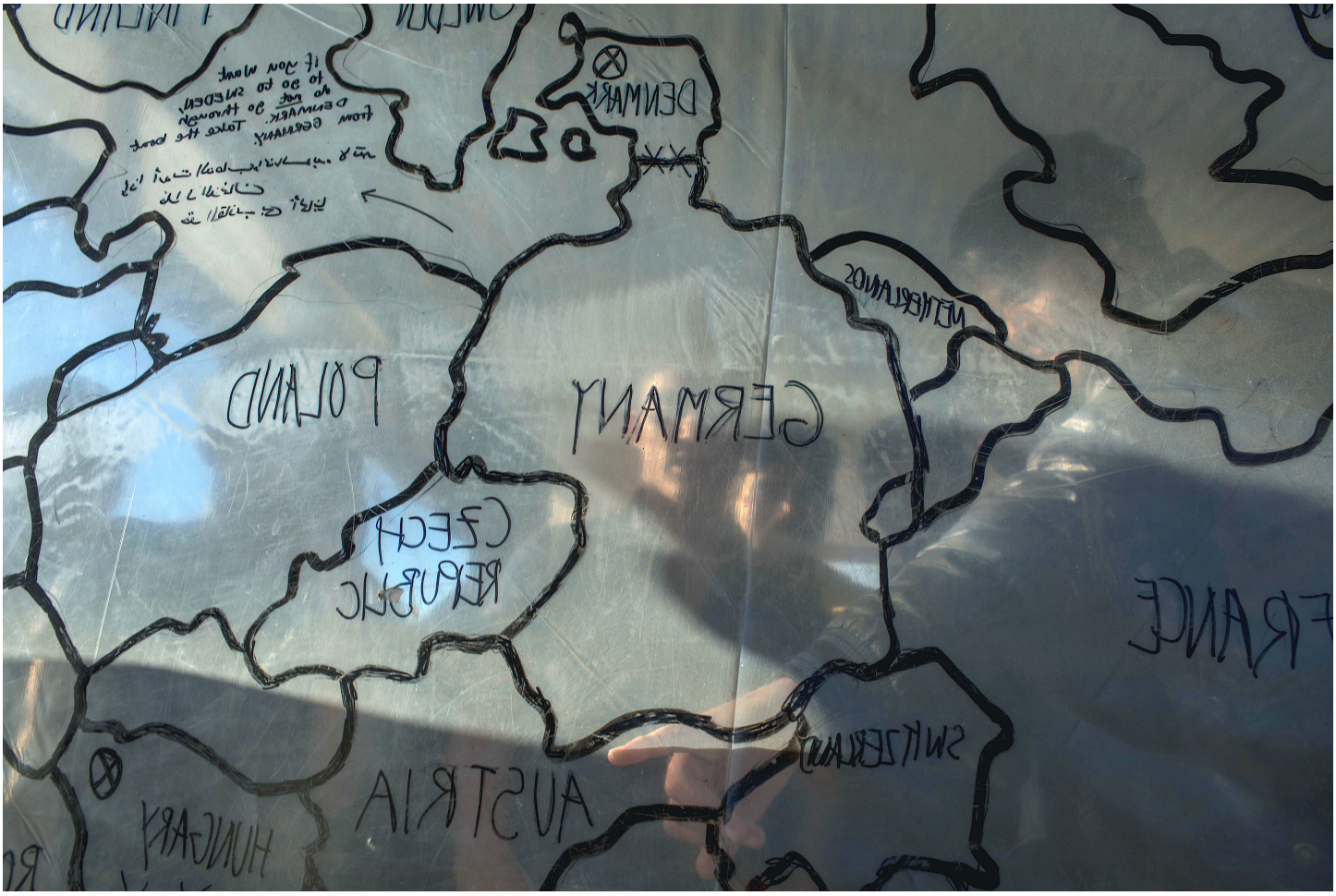


Cartographer and artist Levi Westerveld's map of Those Who Did Not Cross (2005–15). See →.

Driven by curiosity as well as personal concern for these often neglected cartographic visualizations, I decided to contact one of the photographers. Matej Povse is a freelance photographer who followed many refugees in their attempt to reach continental Europe from the shores of Lesbos, Greece in 2015. In his series "New Europeans," Povse includes a picture of an improvised map of Europe drawn on a tent in Moria's registration camp. Asking him about the reasons behind his visual and emotional interest in the many lives and afterlives of maps in the context of the Mediterranean migration routes, I received a telling response:

> The photo in question was taken on November 12, year 2015, on the island of Lesvos/Lesbos in Greece. Many international NGOs were operating outside the Moria refugee camp and were providing refugees and migrants things they absolutely needed after they arrived by boats on the shores and before they were registered in the camp by the officials. Because there wasn't enough space in the camp, there were also "tents" built from plastic tarpaulins in the surrounding area. One of them (on the photo) was intended as an unofficial info center. One side was protected with translucent plastic tarpaulins. And a map was drawn on this tarpaulin. At the time of my assignment, no one knew the author of this map. I observed what they were looking [at] on the map and what they were pointing [to] with hands and fingers. I didn't understand them because they were speaking in their own language. I only understood that they were from Afghanistan. Because it was [the] year 2015, most of the views were focused on Germany and Scandinavia. Of course, it was necessary to check the entire Balkans before going to Germany. As you probably know, the borders across the Balkans were "open" at that time … Also on other assignments, I noticed the Google map app on the phone was a necessary tool for migrants and refugees, especially when crossing borders outside official border crossings to avoid pushbacks. Sharing "unofficial" routes among migrants and refugees has become something of a must.[9]

As evidenced here, maps are, surprisingly, among the few spaces left which can help cultivate the dream of successful movement and resettlement in the daily routines of displaced people. Often appropriated and subsequently personalized, annotated, caressed, touched, and shared, maps may elicit different emotions, aspirations, and expectations that bring the hoped-for, but constantly deferred, possibility of eventual safety into the life of the camp. Povse's description also suggests that cartographic devices are both navigational tools *in* and evocative appearances *of* the migration crisis. As he rightly observes, mobile navigational tools integrated into smartphones, such as Google Maps, have become some of the most important and reliable companions for migrants. Institutional information about safe routes is often difficult to find, while noninstitutional information provided through smugglers is likely deceptive or false. In such situations, migrants often rely exclusively on the routes marked by Google Maps and other apps.



A map of Europe drawn onto a tarpaulin tent at the Moria refugee camp in Lesbos, Greece, 2015. Photo: Matej Povse. Courtesy of Matej Povse.

Furthermore, mapping devices are not only necessary for organizing the journey and orientating oneself in space, but in staging encounters with other people.[10] The "WhatsApp Way," as some sociologists refer to it, stresses the importance of digital technologies in finding crucial information about safe routes, gathering information about the politics of receiving countries, and keeping in contact with families and smuggler and aid organizations.[11]

Povse emphasizes the "narratological" focus of the Moria map, underlining that maps are also evocative images that visually, aesthetically, and emotionally narrate the current condition of (im)mobility experienced by those left behind the edges of mobility policies. If, as engaged critical readers and viewers, we are asked to navigate *within* these images of migration and approach digital and nondigital maps as political and cultural narratives, then those directly involved in the convoluted matter of movement find it more useful to navigate *with* maps because cartographic devices continue to be well-known, orienting tools operating nearly in real time, that help one to plan and move through space.

Depending on the context in which a migratory map appears, the map can be treated as an "actionable object" through which the potential of navigation and movement may be stirred, sensed, and enhanced.[12] Alternatively, the map can also be viscerally deconstructed as an icon-text, as it serves to understand the cultural, emotional, and political ecologies that give sense and meaning to its mediatic impulse. This dual condition of the migratory map (navigational and evocative) becomes apparent when considered in the context of the Mediterranean Sea's necropolitics of migration.

The Circumnavigations of (Im)mobile Lives

When we map and experience the suffocating and interrupted movements of migrants under the frameworks that produce the European migration crisis, spectators and researchers must account for the many hurdles implied by this entangled structure. In this sense, is a map still useful as a navigational tool, or meaningful as an evocative image, when humans *cannot* move?

The cartographic apparatuses that emerge during the tracking or evocation of migratory events in the

Mediterranean Sea are worthy of attention because they reveal a highly ambiguous relationship between the over-mapping of undesired movements—enacted by the rhetoric of the migration "crisis"—and the many unvisibilized immobilities that are instead experienced daily by migrants. As I said before, the word "crisis" in "migration crisis" is not a transparent term, but rather a pejorative shorthand that produces a specific anti-migrant rhetoric. This rhetoric describes an unprecedented and enormous flow of people channeled toward the European Union between 2014 and 2017 that put receiving states "in trouble or dangerous situations."[13] This normative definition of the crisis has required the EU to respond to the constructed massiveness of movement through the securitization and externalization of European borders. The rhetoric of emergency, justified in many international and national press releases, has not only portrayed migrants as threats in the media, but has devalued their lives. In doing so, this rhetoric produces, and subsequently masks, the difficulties, risks, and dangerous situations they encounter.

When biopower—with its regulatory mechanisms to foster and control human life and its movement—slowly uncovers the reciprocal face of necropower, preoccupied with assessing an effective right to kill and paralyze—socially and physically—an undesired population, how should the relation between bodily movement and navigational images be re-elaborated? What spaces does the necropolitic regime construct? What sort of navigation does necropolitics enable? What kind of maps does it produce?

These are some of the questions that come to mind when the other face of the migratory map, which speaks about immobility rather than movement, is brought to the surface. In attempting to address such questions, the cartographic frame can begin to be seen as a polymorphic and allotropic membrane that must adapt to different scenarios, such as the context of immobilization. Reasonably, we might imagine a sort of *cartographic withering* or *stillness*, a circumnavigation (or better, circumvention) of life potentialities. Given the context of widespread death and violence in the Mediterranean, the map suppresses its ontological navigational impulses by filtering through or nurturing the field of necropolitics, thus becoming the epitome of the unliving.

Achille Mbembe famously uses the term "necropolitics" to discuss the role of Foucauldian biopower in designating a postcolonial system marked by different ways of killing and dying—exemplified by slavery, apartheid, the colonization of Palestine, and the figure of the suicide bomber.[14] Social and physical deaths occurring along the many Mediterranean migration routes similarly constitute a necropolitical regime, although with different characteristics from those that Mbembe analyzes. The notion of "terraqueous necropolitics" that I propose addresses some of them, particularly the *amphibian* space and the corresponding power that collaborate to define the immobility governance of current migration.[15] European countries have prompted the preventive blockage of migrants through containment *on land,* in detention centers, and in camps. Yet, those able to traverse terrestrial borders also face the necropolitical agencies that pullulate *the sea*. The countries of the European Union literally decelerated their SAR activity at sea by the end of 2014, reducing the number of rescue boats while also preventing the activity of NGOs. Many humanitarian vessels had launched their own SAR operations in 2015, but EU members' attempts to criminalize and delegitimize rescuers resulted in most NGOs halting their operations by the end of 2018. More dangerously, many mass refoulement and interception operations are now handled by the controversial Libyan coast guard, funded and trained by EU countries with the aim to keep migrants out of the continent through severe human rights violations.

In these terms, the rationale of necropolitics does not even seem to offer the illusion of "free" but tightly controlled movement that is often the characteristic of biopolitical systems, but rather produces a motionless system of navigation. By this I mean that the deterrence of movement requires a slowing down, a blockage—the suppression of movement by means of inaction and delayed intervention. Thus, the terraqueous necropolitical regime implies that EU member states let migrants die *indirectly* through the "violent inaction" of their terrestrial, maritime, and border agencies, often taking advantage of the uncertain application of regulatory frameworks that govern maritime sovereignty and international sea rescue.[16] The aim of the screening border—as alternatively suggested by Dana Diminescu—is "to slow down."[17]

Despite the depiction of border control as a panoptic machine capable of observing and tracing everything through satellites and sensors, this perspective starkly emphasizes that when the time comes to use detection for humanitarian causes (rescuing those at sea, for instance), EU countries instead make themselves look weak, blind, and slow. Slow action thus operates through a corresponding visual component: to make the "letting die" effective, Europe must rely on the appearance of the slow detectability of distress events, and the ability to make themselves seem incapable of dealing with the "crisis."

In migration by boat, this turns rescue maps into navigational devices that may work slowly and intermittently, unvisibilizing the subjects who physically cross the sea (migrants) but disappear from the screens of maritime institutions (victims). Because journeys are clandestine, migrants are forced to travel on untraceable boats, and therefore off the map—unless one of them, or a relative back home contacted through WhatsApp, or the smuggler, calls rescue agencies via a satellite phone. This request for visibility frequently happens "in situations of distress—where—they [migrants] may do everything they possibly can to be detected and on the contrary states and

other actors at sea may selectively close their eyes on their distress."[18] Many other maritime actors can contribute to this regime of penumbral visibility. For instance, commercial vessels may decide to switch off their Automatic Identification System (AIS) to avoid being involved in SAR activities, which are perceived as a waste of time and money.[19] Navy ships can equally decide to switch their AIS on or off, because for security reasons they are not obliged to be detectable at sea.[20]

A tangible example of this purposeful "slowing down" occurred on March 18, 2019, when the Italian Financial Guard ordered the *Mare Jonio* (a private Italian boat supported by the activist platform Mediterranea Saving Humans) to "turn off all the machines," including its navigational systems.[21] This was done to deter the boat from rescuing forty-nine migrants in the SAR zone of Libya. This "cease-mapping" politics, or cartographic withering, is crucial to understanding not only that "all kinds of geographical, geological, biophysical, technological and architectural matters play an active and constitutive role in the expansion of bordered societies and the expulsion of the migrant bodies that sustain," but also that the *inaction* of geographical and technological agents provokes the expulsion of migrant bodies and lives.[22] In the regime of "cartographic" necropolitics, what disturbs the frame must be slowed down and blocked at the threshold of visibility. Life is paused and anesthetized. Movement is made imperceptible. In these situations, the (meta-)cartography of maritime institutions becomes an extension of the subject's inability to see and hear what happens at a remote distance. Mapping mirrors the defects and limitations of the human agent rather than amplifying their potential for control and action. In other words, the map is complicit with terraqueous necropolitics because it is not effectively navigated: it is not put in the position to detect distress events because its tracking functions are progressively suspended for other ideological goals. Ultimately, when state authorities put the map *over troubled water*, governmental rescue mapping paradoxically appears to be dull and inefficient, rather than hyper-visual and panoptic, as critical scholars would expect it to be.

The Evocation of (Im)mobile Lives

Whereas the uncharting of migratory events falls into the category of violent inaction, the cartographic resurfacing of what has been invisibilized by the official mapping of migration governance can reveal the tragic consequences of the failures of the actors involved in terraqueous necropolitics. On the other side of the necropolitical map, many activists and artists evidence the "repressed topographies of cruelty" that are usually silenced by mainstream border narratives.[23] The focus on migration constraints through mapping projects has indeed been a central point of attention for artists producing politically

Zach Lihatsh, Iron Cartography, 2016. Courtesy of the artist.

minded work, who can rethink the informational power of maps and shuffle their allusive potentialities by merging different languages and media. From this perspective, maps are not merely "useful or aesthetic," or "necessities or vain indulgences," but "companions to our emotional lives" and "provocations to thought," per Sherry Turkle.[24] Evocative maps can spark critical, powerful, and emotional responses, not only to the event of mobility, but to the consequences of its immobilization: loss and death.

Zach Lihatsh's work *Iron Cartography* (2016) offers a dramatic example of the evocative power of the map in the context of necropolitics. The artist transformed a cartographic silhouette of the Mediterranean Sea into a copper plate and then scratched its smooth surface by engraving the location of the many casualties found in the database of the Migrants' Files.[25] Providing a plastic and sculptural spatial dimension to the many invisible tragedies that have occurred during migrant journeys, deaths and losses are materially represented through holes generated by gunshots. This act underscores that the politics of letting die perpetuated by Western countries is, in fact, deliberate and intentional.

In the context of evocative necropolitics, maps can also leave the indoor settings of museum spaces and reappear in many public outdoor venues as iconic and creative memorial objects for "collective mourning." For instance, to commemorate a tragic migrant shipwreck that occurred on April 19, 2015, a large map of the Mediterranean Sea was unrolled over a square in Marseille, and flowers were left on its surface to reproduce the setting of a funeral. When maps are used to memorialize migrant tragedies, they often inspire a form of "grief activism"—that is, feelings of empathy and mourning toward people we have

The Shame Counter: Somos Y Seremos Ciudad Refugio, 2019. Public sculpture installed in Barcelona. Photo: Laura Lo Presti. Courtesy of the author.

never met, which can motivate us to denounce European migration policies.[26] This denouncing *through* remembering reassesses the need for hospitality and mutual mobilities, thus shifting to a necessary political discourse on the free movement of people. However, these cartographic performances rarely involve counter-gestures or commemorative acts by victims, whether they are family members of migrants who have died, or survivors themselves. In relation to migratory issues, mapping is still a privileged language and, to a large extent, employed by actors of the Global North. This language not only conveys grief and mourning but also raises a public outcry, one that is a reaction to the culturally, socially, and politically inhuman system in which Europe dissects and decomposes its "others." Migratory mappings are therefore tools of denunciation that are politically aestheticized by artists and activists to take a position and criticize their own value system, even if taking the migrant subject as their referent. This means that the migrant is treated as a catalyst for, and the migrant crisis considered a *putative* crisis of, the very idea of Europe, highlighting an immense political failure on the part of the European countries to see and react humanly and in solidarity with what is happening on their southern shores.

This critical engagement has led to the creation of many memorial sites and archives for denouncing the present and reimagining the future.[27] It is not only at extra-ordinary public gatherings like rallies and demonstrations that people are invited to remember those who are no longer here, whose names and stories are unknown and merely survive as numbers. In Barcelona, the memory of deaths at sea is materialized daily through a metallic structure located in an ordinary space, the beach, populated by crowds of locals and tourists alike. Since 2016, the "shame counter," a screen with the outline of the Mediterranean Sea, has shown the number of people killed or disappeared in the Mediterranean since the beginning of the year, as calculated by the "Missing Migrants Project" of the International Organization for Migration. Although

this memorial may convey an idea of permanence and fixity, the structure is much more unstable and temporary than one might think: the metallic material of the sculpture is subject to corrosion, and the number of fatalities appearing on the cartographic screen is updated weekly and then reset at the end of the year. Like a cruel game, the ongoing deterioration (and reformation) of the map "speaks to its flexibility as a signifier, endowing it with not only a multifaceted but also a certain palimpsest-like quality."[28]

In such examples, maps and map-like objects cease to embody navigational or operational functions and instead express post-navigational and evocative moments, sensing and representing the condition of physical and symbolic immobility instituted by border politics. Once maps are addressed as dense images, their moving or motionless character can be enticingly appreciated, considering that "both moving and still images have the power to move us but also to still us with their capacity to invite a state of contemplation and arrest—particularly infrequent in current times that value movement as a sign of activity, vitality, and advancement."[29]

By keeping track of something that is no longer there, or that never was, maps constitute a contemplative experience of death. In visualizing migrant fatalities as a numerical hemorrhage, they also develop a distinct aesthetic of necropolitics. Such maps, in fact, make viewers understand that immobility and death produce their own movement and geography, since time takes its material toll by corroding and eroding the texture from which maps of death are made, transforming them into mutable and perishable organisms. Visually, immobility affects the architecture of the map as well, in the sense that the viral lines of the maps appearing in the news, usually depicting the alleged invasion of foreign people, now transform into points—death points as opposed to fluxes of life. This corroded, numerical, and dotted choreography uncovers an inhuman, unjust, but nonetheless real geography of necropower that would otherwise remain buried under the seabed.

A Map "Like" Troubled Water?

Although assumed to be lacking in visual detail compared to photographs, maps reveal more complex, troubling, and fascinating characteristics when addressed as explorative and aesthetic images of migration within the frame of contemporary visual culture. Because maps contribute to framing the "optical unconscious" of the migration phenomenon, they should be regarded as more than technical and operational devices.[30] Instead, they should be regarded as evocative images, impregnated with substantive meaning—images that can trigger a variety of emotional responses. This means that, in relation to Mediterranean necropolitics, maps engender plural outcomes: they are navigational tools that (de)generate (in)action; they are loci of meaning; they are visual residues of political struggles; and they are evocative meditations. The adoption of a visual and aesthetic lens in mapping serves here to contextualize each of those mapping conditions and to highlight the different visual and affective regimes that migratory mappings subtended.

In this brief investigation, certain maps and mapping functions have been shown to move and create, while others to slacken and linger. Some maps are large, bulky, and stationary, but nonetheless can shape consciousness and feelings. Others are miniaturized and mobile, transformed into bits of pocket-sized technology that move with people. Viewers of images and maps should attune themselves more seriously to this alternative regime—evocative or navigational—of cartographic images, objects, and practices in the context of migratory necropolitics. In their ascribed "banality," maps encountered in the news, in navigational devices, in critical cartographic artworks, and in memorials convey contemporary feelings and anxieties about the migration crisis and its patterns of control and (im)mobility, which demand further scholarly attention and activist engagement. Like the sea and its troubled waters, even a map can be "indisputably voluminous, stubbornly material, and unmistakably undergoing continual reformation."[31]

X

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